The South African National Health and Nutrition Examination Survey

SANHANES-1

Financial support from

health
Department:
Health
REPUBLIC OF SOUTH AFRICA

Department of Health

DFID Department for International Development

UK Department for International Development

HSRC Human Sciences Research Council

Human Sciences Research Council

Compiled by a research consortium comprising
HSRC and MRC

HSRC Human Sciences Research Council

MRC SOUTH AFRICA

Published by HSRC Press
Private Bag X9182, Cape Town, 8000, South Africa
www.hsrcpress.ac.za

First published 2013

ISBN (soft cover) 978-0-7969-2446-9
ISBN (pdf) 978-0-7969-2447-6
ISBN (e-pub) 978-0-7969-2448-3

Typeset by Laura Brecher
Illustrations by Jenny Young
Cover design by Marise Taljaard

Printed by Paarl Media Paarl

Distributed in Africa by Blue Weaver
Tel: +27 (0) 21 701 4477; Fax: +27 (0) 21 701 7302
www.oneworldbooks.com

Distributed in Europe and the United Kingdom by Eurospan Distribution Services (EDS)
Tel: +44 (0) 17 6760 4972; Fax: +44 (0) 17 6760 1640
www.eurospanbookstore.com

Distributed in North America by River North Editions, from IPG
Call toll-free: (800) 888 4741; Fax: +1 (312) 337 5985
www.ipgbook.com

Suggested citation: Shisana O, Labadarios D, Rehle T, Simbayi L, Zuma K, Dhansay A, Reddy P, Parker W, Hoosain E, Naidoo P, Hongoro C, Mchiza Z, Steyn NP, Dwane N, Makoae M, Maluleke T, Ramlagan S, Zungu N, Evans MG, Jacobs L, Faber M, & SANHANES-1 Team (2013) *South African National Health and Nutrition Examination Survey (SANHANES-1)*. Cape Town: HSRC Press

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FOREWORD

South Africa is undergoing a process of epidemiological transition from infectious to non-communicable diseases (NCDs). While the burden of infectious diseases such as HIV and TB remains high, there are now other emerging epidemics of NCDs. NCDs, mainly cardiovascular diseases, cancers, chronic respiratory diseases and diabetes represent a leading threat to human health and development. According to World Health Organization (WHO) statistics, these four diseases are the world's biggest killers, causing an estimated 35 million deaths each year – 60% of all deaths globally – with 80% in low- and middle-income countries (WHO, 2008). These diseases are preventable. Up to 80% of heart disease, stroke, and type 2 diabetes and over a third of cancers could be prevented by eliminating shared risk factors, mainly tobacco use, unhealthy diet, physical inactivity and the harmful use of alcohol. Unless addressed with urgency, the mortality and disease burden from these health problems will continue to increase in our country.

There is therefore a great need for a better understanding of both the prevalence of NCDs and the associated risk factors among South Africans and a need to translate such information into effective health policies, health programmes and services. It is timely that the HSRC and its various partners including the Medical Research Council (MRC) and several South African universities have been able to come together and undertake this fundamental survey, the first South African National Health and Nutrition Examination Survey (SANHANES-1). Indeed, this survey report could not have come at a better time as we now begin the enormous task to implement the National Health Insurance (NHI) system. It is also important to note that one of the Ten Point Plan actions for the Department of Health is the introduction of this type of survey that will assess the health and nutritional status of adults and children in South Africa. The Government's Strategic Priority: 'Improve the health profile of all South Africans' requires a dedicated survey such as SANHANES-1 that addresses the National Department of Health's (NDoH) priority health indicators.

The uniqueness of SANHANES-1 is its ability to integrate findings from personal interviews with standardised physical examinations, diagnostic procedures, and a variety of laboratory tests. The results provide information on a broad range of health topics and associated risk factors that were beyond the scope of previous Demographic and Health Surveys (DHS). SANHANES-1 data will provide critical information for establishing national standards for weight, height, and blood pressure.

On behalf of the South African Government and in particular the National Department of Health, I would like to thank the team of HSRC researchers under the leadership of the four principal investigators of this survey, namely, Professors Olive Shisana, Demetre Labadarios, Thomas Rehle and Leickness Simbayi, together with other researchers drawn from the MRC and the various South African universities, for their wisdom and vision in undertaking this survey that addresses health information requirements of national interest.

I would also like to take this opportunity to thank the Department for International Development (DFID) of The United Kingdom for co-funding this survey together with the National Department of Health. For us, this is another example of the excellent developmental support that is provided to our country by the British Government.

It is my fervent hope that all readers of this report, in particular health policy makers, health programmers, members of civil society as well as health researchers and scientists will find this report as useful as I found it in informing their work. I also look forward to future instalments of this survey to monitor our progress in delivering good quality health care services and disease-prevention programmes and thus ensure a healthy life for all South Africans.

Dr Aaron Motsoaledi
Minister of Health, South Africa

ACKNOWLEDGEMENTS

To undertake a project of this magnitude requires a collective effort among many people who bring a range of expertise and experience at different stages. This project would not have been possible without the contribution of the many people listed in Appendix 1.

We thank all the people of South Africa who participated in the survey and gave us information about their health as well as their social, economic, and behavioural determinants of health, for the sake of contributing to a national effort to establish the first South African National Health and Nutrition Examination Survey as well as to map the emerging epidemics of non-communicable diseases (NCDs) in the country. Thousands were willing to give blood specimens for testing disease biomarkers to enable us to estimate the prevalence of NCDs in South Africa. We sincerely thank them for their generosity. Without their participation, we would never have been able to provide critical information necessary for establishing the health and nutritional status of the nation.

We are grateful to those who funded the study, the Department for International Development, UK, and the National Department of Health. Without their financial support, the study would not have been possible.

Thank you to the Medical Research Council (MRC) for partnering with us to undertake this survey.

We also acknowledge the contribution of the members (Appendix 1) of the Steering Committee (DOH, MRC, UNICEF, Stats SA, PSPPD, USAID), the Advisory Panel University of the Free State (UFS), University of Limpopo (UL), University of the Western Cape (UWC), North West University (NWU), University of Stellenbosch (US), Nelson Mandela Metropolitan University (NMMU) and the Technical Advisory Groups who both advised the research team at the start of the project and also reviewed the draft report for technical soundness.

A sincere vote of thanks is also extended to all who provided training to the field staff (Appendix 1); especially Chantell Witten and Dhananjoy Gupta (Unicef) who provided training on the child health module (Road to Health Booklet and Immunisation), Natasha Oliphant (Medical and Audiometric Sales) who provided training on spirometry, Theo Nell (Stellenbosch University) who provided training on anthropometry and Tony Bunn (MRC) who provided training on the use of bioelectrical impedance test.

We express our sincere gratitude to all provincial coordinators who assisted with quality control throughout the study and who stayed away from home for long periods of time; without them, the study would not have been possible. We wish to thank the field teams (Appendix 1); team leaders, doctors, nurses, clinic administrators, clinic assistants and fieldworkers for their excellent work in collecting very good quality questionnaire and clinic data.

We also thank the project administrators and data checkers who worked on the project tirelessly as well as the HSRC Geographic Information Systems (GIS) department and Data Capturing Unit for their support in providing superior quality maps and directions to selected enumeration areas in which the survey was conducted.

Further we acknowledge the administrative support of the HSRC's support staff; Supply Chain Management, Finance, Payroll and Communications departments.

Thanks also to the HSRC Press publishing team for their expertise and careful guidance of the editing and production of this book.

Our gratitude is also due to our service providers: Travel Adventures and Magic Travel consultants who worked all hours to ensure that all travel arrangements were made, Kitskopie for printing all the materials for the survey, DHL for transporting research materials and Pathcare and Lancet laboratories for their excellent work in the testing and analysis of specimens to enable us to estimate the biomedical outcomes.

Finally, but not least, we would like to thank our respective families for their unflinching support and love during all phases of this survey, especially during both the fieldwork and the writing up of this report.

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EXECUTIVE SUMMARY

Introduction

Health and nutritional status, particularly that of young children, serve as important indicators of development, social upliftment and access to resources within communities at large. According to World Health Organization (WHO) and the Constitution of South Africa, sustained access to health care and adequate food for a healthy and active life is a human right. Despite some notable achievements in the South African health care system, challenges remain to address the high disease burden, largely due to HIV/AIDS and tuberculosis (TB) and the emerging epidemic of non-communicable diseases (NCDs), the health care consequences of trauma and violence, inadequate financing, the existence of a two-tiered health care delivery system, the escalating cost of medicines and skilled human resource shortages (Shisana 2013; Mayosi, Lawn, Van Niekerk et al. 2012).

The **S**outh **A**frican **N**ational **H**ealth and **N**utrition **E**xamination **S**urvey (SANHANES-1) was established as a continuous population health survey in order to address the changing health needs in the country and provide a broader and more comprehensive platform to study the health status of the nation on a regular basis. The first SANHANES, SANHANES-1, provides critical information to map the emerging epidemic of NCDs in South Africa and analyses their social, economic, behavioural and environmental determinants. Data on the magnitude of and trends in NCDs, as well as other existing or emerging health priorities, will be essential in developing national prevention and control programmes, assessing the impact of interventions, and evaluating the health status of the country

Objectives

The primary objectives of the SANHANES-1 were to assess defined aspects of the health and nutritional status of South Africans with respect to the prevalence of NCDs (specifically cardiovascular disease, diabetes and hypertension) and their risk factors (diet, physical activity and tobacco use):

- The knowledge, attitudes and behaviour of South Africans with respect to non-communicable and communicable infectious diseases;
- The nutritional status of South Africans as it relates to food security, dietary intake/ behaviour including the consumption of alcohol, and body weight management;
- The relationship between general perceptions of health and health care services;
- The health status of children under the age of five years;
- The health status of children aged 2–9 years with respect to physical and/or mental disabilities;
- The behavioural (smoking, diet, physical inactivity) and social determinants of health and nutrition (demographic, socio-economic status and geolocation) and relate these to the health and nutritional status of the South African population.

Methodology

Key elements of the SANHANES-1 methodology are summarised in this section.

Study population

SANHANES-1 included individuals of all ages living in South Africa. All persons living in occupied households (HHs) were eligible to participate, but individuals staying in educational institutions, old-age homes, hospitals, homeless people, and uniformed-service barracks were not eligible to participate in the survey.

Study design

SANHANES-1 obtained questionnaire-based data through interviews in combination with health measurements obtained through clinical examination, a selection of clinical tests as well as the collection of a blood sample for selected biomarker analysis.

This first round of SANHANES (SANHANES-1) was a cross-sectional survey providing baseline data for future longitudinal analysis. The SANHANES-1 project also combined longitudinal as well as cross-sectional design elements. A prospective cohort approach addressed the relationships between medical, nutritional and behavioural/societal risk factors assessed in the first survey phase (SANHANES-1) and subsequent morbidity, mortality and changes in risk factors at the national level.

Sampling

The survey applied a multi-stage disproportionate, stratified cluster sampling approach. A total of 1 000 census enumeration areas (EAs) from the 2001 population census were selected from a database of 86 000 EAs and mapped in 2007 using aerial photography to create the 2007 HSRC master sample to use as a basis for sampling of households. The selection of EAs was stratified by province and locality type. In the formal urban areas, race was also used as a third stratification variable (based on the predominant race group in the selected EA at the time of the 2001 census). The allocation of EAs to different stratification categories was disproportionate, in other words, over-sampling or over-allocation of EAs occurred in areas that were dominated by Indian, coloured or white race groups to ensure that the minimum required sample size in those smaller race groups were obtained. Based on the HSRC 2007 Master Sample, 500 Enumerator Areas (EAs) representative of the socio-demographic profile of South Africa were identified and a random sample of 20 visiting points (VPs) were randomly selected from each EA, yielding an overall sample of 10 000 VPs. EAs were sampled with probability proportional to the size of the EA using the 2001 census estimate of the number of VPs in the EA database as a measure of size (MOS).

One of the tasks of SANHANES-1 was to recruit and establish a cohort of 5 000 households to be followed up over the coming years. The sampling consisted of:

- Multi-stage disproportionate, stratified cluster sampling approach;
- 500 EAs within which 20 VPs/households per EA were sampled;
- Main reporting domains: sex (male, female), age-group (< 2 years, 2–5 years, 6–14 years, 15–24 years, 25–49 years, 50 years and older), race group (black African, white, coloured, Indian), locality type (urban formal, urban informal, rural formal [including commercial farms] and rural informal], and province (Western Cape, Eastern Cape, Northern Cape, Free State, KwaZulu-Natal, North West, Gauteng, Mpumalanga, Limpopo).

Data for this survey were collected in two separate but integrated components. These components included administering questionnaires to participants (conducting interviews) and performing a clinical examination (medical checkup by a doctor, selected measurements by a nurse/clinic assistant and collection of a blood sample for biomarker analysis) on each participant.

Results

Of 10 000 households (VPs) sampled, 8 168 were valid, occupied households and 1 832 VPs were invalid or clearly abandoned VPs/households. Of the 8 168 valid VPs/households, 6 306 (77.2%) were interviewed and 1 289 (15.8%) refused to take part in the survey. In the 8 168 valid VPs/households that agreed to participate in the survey, 27 580 individuals were eligible to be interviewed. A total of 25 532 individuals (92.6%) completed the interview whilst 7.4% refused to participate. The 25 532 individuals who agreed to be interviewed were further invited to participate in the physical and clinical examination conducted in the clinic.

Socio-economic demographics

Demographics is an essential component of any survey and it provides information about the background of the population studied for the reader, and policy makers alike, against which the findings are interpreted.

Education

In a sample of 19319 individuals, 6% had no schooling, 34% completed a primary school level of education, 33% completed high school, 20% completed matric, while 8% completed a tertiary level of education. Participants aged 55–64 year olds (17%), and those 65 years and older (38%) tended to have had no schooling or had attended primary school and a small percentage had completed matric (40% and 32%, respectively) whilst those younger than 55 years had relatively higher levels of educational attainment with more high school education, matric completion rates and tertiary education level. Provincially, variations were apparent with Gauteng having more people who attained matric and tertiary level education (27% and 12%, respectively). There was no sex difference in the educational characteristics of participants especially in terms of high school and tertiary education.

Perception of cost of living

With regard to participants' perception of household cost of living by locality, 39% of 5 972 households indicated that their households did not have enough money for basic things, such as food and clothes, while 18% indicated that they had most of the important things, but few luxury goods. Most affected households are those amongst urban informal and rural informal settlements. North West (58%) had the most households that reported not having enough money for basic things, such as food and clothes. Gauteng had the fewest such households (29%)

Reported monthly income

The majority of respondents surveyed in urban formal (28%), urban informal (38%) and rural informal (42%) households, reported that they had no formal income. Interestingly, 53% of rural formal dwellers reported earning between R801 and R3 200 per month (which is only a reflection of the wide range of this income category since 36% of participants earned between R802 and R1 600, and 17% earned between R1601 and R3 200) , while 21% reported no formal income. Within the nine provinces, Mpumalanga (46%) followed by North West (40%), Eastern Cape (43%) and Northern Cape (41%) had the most people reporting no income.

Reported source of income

The reported source of income by sex shows gender disparity where more men (46%) as opposed to females (32%) receive salaries and wages and where more females (27%) relied on pensions, grants and UIF than males (15%). In terms of age as indicated by those who received an income, the majority of those between 18 and 54 years old received salaries and wages while those who are older mainly relied on pensions, grants and UIF as an income source. The results show income inequalities by locality type where rural formal respondents (57%) were more likely than urban formal participants (46%) and urban informal participants (39%) to earn salaries and wages. Rural informal participants were the least likely than all other locality groups to earn salaries and wages but just over a third of them relied on pensions, grants and UIF.

KwaZulu-Natal, North West and Eastern Cape had the most respondents indicating pensions, grants and UIF as contributing to their earnings (32%, 31% and 30%, respectively). Whites had the largest proportions of all race groups deriving their income from salaries and wages as only 14.2% did not have any income.

Health status of adults: National estimates of NCDs and major risk factors

In SANHANES-1, the health status of adults was estimated using: self-reported family history of chronic NCDs; prevalence of self-reported previously diagnosed health conditions combined with a physical examination, clinical tests (fitness) and selected for age disease biomarkers in all the survey's participants.

Self-reported rates of family history of NCDs

Of the four NCDs listed, respondents were most likely to self-report a family history of high blood pressure (30.9%) followed by family history of high blood sugar (20.7%), while fewer respondents having reported a family history of stroke (8.9%) and heart diseases (heart attack, angina, chest pain; 7.6%).

The rate of self-reported family history of all the four assessed conditions was highest among respondents in urban formal settings. Respondents in the Free State had the highest rate of self-reported family history for all four NCDs listed; high blood pressure (45.8%), heart disease (14.2%), stroke (14.5%) and high blood sugar (26.7%).

A high rate of self-reported family histories of all the four chronic conditions was predominant in five of the nine provinces – Western Cape, Eastern Cape, Northern Cape, Free State and KwaZulu-Natal.

The rate of self-reported family history of high blood pressure, heart disease and high blood sugar was highest among Indians (46.8%, 28.8% and 49%, respectively), while coloureds had the highest self-reported family history rate of stroke (14.1%). Black Africans on the other hand, had the lowest self-reported family history rate of all four NCDs.

Self-reported rates of personal history of NCDs

Females had a significantly higher self-reported rate than males for high blood pressure (20.6% and 12%), heart disease (2.9% and 1.5%) and high blood sugar (6% and 4%) respectively. Among both males and females, the reported rate of all NCDs tended to increase with age. There were no significant differences between the rate of self-reported personal history of high blood pressure, heart disease and stroke among both males and females in different localities.

Rate of self-reported personal history of both high blood cholesterol and high blood sugar was significantly higher among males in urban formal settings (5.7% and 5.1%, respectively) compared to urban informal (0.6% and 1.8% respectively) and rural informal (1.2% and 2.5% respectively) settings. Females residing in urban formal settings had a significantly higher rate of self-reported personal history of high blood cholesterol (6.4%) compared to females in all other settings (1.6% to 2.3%), while females residing in urban formal settings had a significantly higher rate of self-reported personal history of high blood sugar (6.9%) than in females in urban informal settings (3.7%).

Clinical examination: Measured blood pressure

Mean systolic blood pressure for males (130 mmHg) was significantly higher than for females (127.5 mmHg) but diastolic blood pressure did not differ significantly by gender. In this report, the means and prevalence of high blood pressure are reported for the total number of participants. Mean systolic blood pressure increased progressively with increasing age from a mean of 118.1 mmHg (15–24 years group) to over 149.3 mmHg in the over 65 years of age group. The mean systolic blood pressure reached prehypertension levels at the group aged 25–34 years. Mean diastolic blood pressure increased with increasing age for age groups 15–24 (66.4 mmHg) to 45–54 (80.6 mmHg), plateaued between 54 and 64 years, and declined in the older age groups with a mean of 77.6 mmHg in the 65 and older age group. Across localities, urban informal (124 mmHg) and rural informal (127.9 mmHg) had the lowest mean systolic blood pressure, while across provinces, the highest systolic blood pressures were recorded in Western Cape (131.8 mmHg), Free State (133.9 mmHg) and North West (131 mmHg). White (130.8 mmHg) and coloured race (132.1 mmHg) groups had the highest mean systolic blood pressure. A similar pattern was seen overall for the mean diastolic blood pressure.

Of those respondents who volunteered to undergo a clinical examination and were found to have a high blood pressure, more than two thirds were overweight or obese and less than a third consumed alcohol.

The mean pulse rate, beats per minute (bpm) was significantly higher in females (77 bmp) when compared with males (70 bmp) but was similar across all age groups and it ranged between 73 bpm to 75 bpm. Similarly, differences in mean pulse rate by locality, province and race were of no meaningful clinical significance.

Clinical examination: Measured cholesterol

In this survey, the mean serum total-, HDL-, and LDL-cholesterol concentrations for males was, respectively, 4.21 mmol/L, 1.22 mmol/L and 2.44 mmol/L. The mean serum triglycerides concentration was 1.44mmol/L. Serum total cholesterol, LDL-cholesterol and triglycerides progressively increased with age and peaked in the older age groups with an overall consistent decline in the 65 years and older age group. Mean HDL-cholesterol remained over all constant with age.

Participants in the formal urban and formal rural areas had overall significantly higher serum total- and LDL cholesterol as well as triglycerides. Provincially, Western Cape had the highest and significantly higher, serum total and LDL-cholesterol and the Northern Cape the highest triglyceride concentrations. By race, the black African group had the lowest and significantly lower, mean concentrations in all the lipid parameters measured. An overall very similar pattern was documented for female participants.

Clinical examination: Measured blood sugar

At the national level, the mean HbA1c of combined male and female respondents was 5.9%; no significant differences by sex were observed. Mean HbA1c increased significantly with age reaching its highest value (6.4%) in the 55–64 years age group. Urban informal residents had the lowest HbA1c value (5.6%). The four provinces with overall significantly higher values of 6% or greater were Western Cape, Eastern Cape, Northern Cape and North West. The two race groups with significantly higher HbA1c values were coloureds (6%) and Asians/Indians (6.5%). Almost one out of five participants (18.7%) had impaired glucose homeostasis. Diabetes (HbA1c > 6.5%) was diagnosed in 9.6%, and diabetes should be excluded (HbA1c > 6.1 and < 6.5%) in 9.1% of the participants. The prevalence of impaired glucose homeostasis (HbA1c > 6.1 and < 6.5%) and diabetes (HbA1c > 6.5%) increased with age, reached a peak in the groups aged 45–54 years and 55–64 years and was the highest among rural informal (11.9%) and urban formal (11.3%) residents. The prevalence of impaired glucose homeostasis and diabetes was in excess of 10% (range 10 to 21.7%) in five of the nine provinces. The coloured (11.2% and 13.4%) and Asian/Indian (11.1% and 30.7%) race groups had the highest prevalence of impaired glucose homeostasis and diabetes, respectively.

Adult health risk profiles

NCDs require intensified national action including a strategic plan that addresses prevention, early detection, behavioural change and universal treatment

Tobacco use

Tobacco use is the leading cause of premature mortality globally.

Prevalence of ever smoking tobacco

Overall, 20.8% of the population has a reported history of ever having smoked tobacco and 79.2% have never smoked tobacco. ‘Ever smokers’ are comprised of those who are daily smokers (16.2%), ex-smokers (2.6%), and less than daily smokers (2%).

Prevalence of ever using other tobacco products

Overall, 6.7% of the population reported having ever used other tobacco products and 93.3% having never used other tobacco products. ‘Ever users of other tobacco products’ comprised of those who are daily users (4.9%) and less than daily users (1.8%).

Patterns of tobacco smoking behaviour among ever smokers

Of those individuals who reported ever smoking tobacco, 72.5% currently smoked daily, 8.4% currently smoked less than daily and 19% had stopped smoking tobacco. Daily smoking rates were significantly higher among males (76.1%) than females (62%). The prevalence of having stopped smoking was significantly higher for females (29.5%) than for males (15.4%).

The lowest rate of daily smoking among those who had ever smoked tobacco was found among people over the age of 65 and older (55.7%), which was significantly lower than the national rate (72.5%). Ever tobacco smokers aged 15–24 years reported significantly higher rates of smoking less than daily (12.8%) when compared with those aged 65 and older (4.4%).

Individuals from rural formal localities who had ever smoked tobacco reported a significantly higher prevalence of smoking daily (83.3%) when compared with the national rate and with urban formal (71.8%) and rural informal (69%) localities. Individuals from rural formal localities also had the lowest rates of having stopped smoking (8.2%), which is significantly lower than individuals from urban formal (21%) and rural informal (20.1%) localities.

Patterns of other tobacco product use among ever users of other tobacco products

Among ever users of other tobacco products, using other tobacco products on a daily basis was significantly higher for individuals aged 65 and older (77.6%) than those aged 15–24 (47.5%) and those aged 25–34 (58.5%).

Ever users aged 15–24 years reported a significantly higher rate of less than daily use of other tobacco products (25.6%) than those aged 65 years and older (7.7%).

Ever users of other tobacco products, participants from rural formal localities had the highest rate of daily use of other tobacco products (82.3%), which was significantly higher than the national rate of 61.6%, and significantly higher than among Individuals from urban formal localities (56.7%).

Age of initiation of smoking among ever smokers

The mean age of initiation of tobacco smoking was 17.4 years. Those aged 15–24 years had a significantly younger age of initiation (mean 13.4 years) than those in older age groups: 25–34 (mean age of initiation 15.8 years), 35–44 (mean age of initiation 18.2), 45–54 (mean age of initiation 19.1 years), 55–64 (mean age of initiation 20 years), and 65 and older (mean age of initiation 22.5 years). There was no significant variation in the mean age of initiation of tobacco smoking by locality. However, Western Cape residents had the lowest mean age of initiation of smoking (14.5 years), which was significantly lower than the national average of 17.4 years. Indian individuals had the lowest mean age of initiation of smoking (10.9 years) which was significantly lower than for black African individuals (18.1 years).

Duration of smoking

The mean duration of smoking among individuals who currently smoked was 17.9 years. The average duration of smoking was highest for the Free State province at 20.2 years. Black African individuals reported a significantly lower mean duration of smoking (16.1) than white (23.5 years) and Coloured (20.3 years) individuals.

Number of cigarettes smoked per day among current smokers

Among current smokers, the mean number of cigarettes smoked per day was 8.5.The mean number of cigarettes smoked per day among current smokers increased with age until 64 years then decreased thereafter. People in urban informal localities smoked 6.7 cigarettes per day compared to the national average of 8.5 cigarettes smoked per day. Current smokers in Northern Cape reported the highest mean number of cigarettes smoked per day (13.5). Black African current smokers reported smoking a significantly lower mean number of cigarettes per day (7.6) cigarettes compared to all other race groups.

Blood cotinine levels

Cotinine is the major proximate metabolite of nicotine, the addictive agent in tobacco. Cotinine is widely used as biomarker of exposure to tobacco for both active and second-hand tobacco smoke. Nearly two-thirds (62.2%) of individuals had cotinine detected in their blood. One third (32.2%) had cotinine levels of < 10 ng/ml and 29.9% >10 ng/ml. Males who had cotinine detected in their blood had a significantly higher mean cotinine level (241.3 ng/mI) when compared with females (213.1 ng/ml). Individuals aged 65 years and older had the highest mean cotinine level (262 ng/ml), which was significantly higher than for those aged 15–24 years (196.1 ng/ml).

Ex-smokers and ex other tobacco product users

The mean age of initiation of smoking for ex-smokers aged 15–24 (13.4 years) and 25–34 (15.8 years) was significantly lower than for ex-smokers aged 35–44 (18.2 years), 45–54 (19.1 years), 55–64 (20.3 years) and 65 and older (27.3 years).

The mean age of initiation of other tobacco products use for ex-users of other tobacco products aged 15–24 (16.2 years) and 25–34 (19.6 years) was significantly lower than for ex-other tobacco products users aged 35–44 (24.1 years), 45–54 (27.1 years), 55–64 (34.1 years) and 65 and older (35.4 years). The time elapsed since quitting the use of other tobacco products for the 15–24 age group (1.8 years), 25–34 age group, and 35–44 age group (7.1) was significantly lower than those aged 65 and older (22.8 years).

Exposure to environmental tobacco smoke

Nationally, 77.5% of the individuals reported that they have never been exposed to Environmental Tobacco Smoke (ETS) in their homes. However, 17.7% of individuals reported being exposed to ETS on a daily basis in their homes. Daily exposure to ETS was significantly higher for males (20.4%) than for females (15.4%). Individuals over the age of 65 were least exposed to ETS (13.4%).

The prevalence of exposure to daily ETS by coloured individuals (40.7%) was significantly higher than the national average (17.7%). Coloured individuals reported having a significantly higher rate of exposure to daily ETS (40.7%) than white individuals (16.5%) and black African individuals (14.9%).

Smoking cessation patterns

Among current smokers, 28% reported indicated that they had been advised to quit the use of tobacco products, 48.1% had tried to quit, and 49.4% reported that the warning labels made them think about quitting.

Among those individuals who were advised to quit, females reported a significantly higher rate (38.7%) than males (26.1%). In the older age groups, the percentage of people who reported that they had been advised to quit by their doctors or health care practitioners increased. The youngest age group, 15–24, reported a significantly lower rate of having been advised to quit tobacco using behaviour at 13.8% compared with the national average of 28.8 %.

Individuals from rural formal settings reported a significantly lower rate (34.7%) of trying to quit their smoking behaviour compared to the national average (48.1%). Individuals from rural formal settings reported a significantly lower rate (34.7%) of trying to quit their smoking behaviour compared to those from urban formal (49.9%) and urban informal (56.9%) settings.

Effects of warning labels on smoking cessation

Northern Cape had the highest rate (61.6%) of reporting that cigarette warning labels encouraged them to think about quitting while Limpopo had the lowest rate 36.5%. Northern Cape also reported a significantly higher rate of cigarette warning labels encouraging them to think about quitting (61.6%) compared with the national average (49.4%).

Physical activity

Almost two-thirds of male participants (62.4%) were found to be physically fit compared to 27.9% of males who tested to be unfit. On the other hand, only 42% of female participants were found to be physically fit and this did not differ significantly from those who tested to be unfit (45.2%). More than 57% of male participants in each age group 18–24 (65.9%), 25–29 (61.9%) and 30–40 (57.1%) were found to be physically fit. However, a notable but statistically insignificant reversal of this trend was found among all female participants where 38% of those aged 18–24 years who tested to be fit increased to 45.8% in those aged 25–29 years and 45.0% in those aged 30–40 years. In summary, therefore, one out of four males (27.9%) and one out of two females (45.2%) were unfit.

Anthropometry

In adults, body measurement data are used to evaluate health and dietary status, disease risk, and body composition changes that occur over the adult lifespan.

Body weight and height

The mean weight (kg) and height (cm) of participants aged 15 years and older by sex, age, locality, province and race, indicate that, overall, South African females were significantly heavier than males (72.1 kg compared to 66.9 kg). However, males were significantly taller than females (168.4 cm compared to 157.7 cm). The highest mean weights were seen in the age groups of 45–54 years and 55–64 years in both genders (73.7 kg and 71.8 kg for males and 78.9 kg and 78.1 kg for females respectively) compared to the group aged 15–24 years (59.5 kg and 63.4 kg in males and females, respectively). Females within the age group 65 years and older were the shortest (154.6 cm) compared to the other age groups (157.2 cm to 158.9 cm).

Body mass index (BMI)

The mean BMI and percentage of males and females aged 15 years and older by BMI categories for age, locality, province and race, indicate that, overall, South African males had a mean BMI of 23.2 kg/m^2, which was significantly lower than that of females (29). The prevalence of overweight and obesity was significantly higher in females than males (25% and 40.1% compared with 19.6% and 11.6% for females and males, respectively). On the other hand, the prevalence of underweight and normal weight was significantly higher in males than females (13.1% and 55.7% compared to 4.0% and 30.9% for males and females, respectively). There was a trend demonstrating that the BMI increased with age in both sexes, while it later decreased in females within the age group 65 years and older group. The age groups of 45–54, 55–64 and 65 years and older had a significantly higher mean BMI (31.5; 31.6; 30.0 for females, respectively and 25.8; 25.0; 25.4 for males, respectively), when compared with the age groups 15–17 years and 18–24 years (23 and 26.2 for females and 20.5 and 21.3 for males, respectively).

Waist circumference

Mean waist circumference for males and females was 81.2 cm and 89.0 cm, respectively. One in ten males (9.9%) had a waist circumference equal to or larger than 102 cm, while 50.5% of females had a waist circumference equal to or larger than 88 cm.

In males, the age category with the highest mean waist circumference was 65 years and older (90.2 cm), while females aged 55–64 years had the highest mean waist circumference (96.4 cm). The highest prevalence of an increased waist circumference (equal to or more than 102 cm in males and 88 cm in females) was seen in males aged 45–54 years (22.0%) and females aged 55–64 years (70.5%).

Waist–hip ratio

The mean waist–hip ratio for males and females was 0.87 and 0.86, respectively. While only 7.0% of males had a waist–hip ratio equal to or larger than 1.0, the prevalence of an increased waist–hip ratio (more than or equal to 0.85) in females was almost seven times greater at 47.4%.

Both males and females 65 years and older had the highest mean waist–hip ratio (0.93 and 0.92 respectively). In males, the highest prevalence of an increased waist–hip ratio was seen in the age category 55–64 years (16.3%) followed by 65 years and older (15.0%). In females, the highest prevalence of an increased waist–hip ratio was seen in the age category 65 years and older (69.5%), followed by 55–64 years (62.7%).

Household food security

Overall 45.6% of the population were food secure (score of zero), 28.3% were at risk of hunger (score 1–4) and 26.0% experienced hunger (were food insecure). The largest percentage of participants who experienced hunger (food insecurity) was in urban informal (32.4%) and in rural formal (37.0%) localities. The highest prevalence of being at risk of hunger was in the urban informal (36.1%) and rural informal (32.8%) areas. The lowest prevalence of hunger was reported in urban formal areas (19.0%). By province, the prevalence of hunger was the lowest in Western Cape (16.4%) and Gauteng (19.2%). Eastern Cape and Limpopo were the only two provinces with a hunger prevalence higher than 30%. The black Africans race group had the highest prevalence of food insecurity (30.3%), followed by the coloured population (13.1%). Furthermore, 30.3% of the black African population and 25.1% of the coloured population were at risk of hunger. A large percentage (28.5%) of the Indian population was also at risk of hunger. The majority (89.3%) of the white population was food secure.

Household alcohol use

The majority of the households (53.2%) reported not having anyone who consumed alcohol in the household and nearly one third (31%) identified an adult male as a consumer of alcohol and about one tenth (9.3%) identified adult females.

Among the 45.6% of households that reported household alcohol consumption, the majority (61.3%, 95% CI: 57.3–65.2) of these household members were not perceived as having a problem of misuse of alcohol by the head of the household. There was a difference in these perceptions with significantly more heads of the households in both rural informal (tribal authority) and urban formal areas (67.3% and 64.5% respectively) indicating that this was the case than those of households in urban informal areas (47.3%).

Conversely, significantly more heads of households in urban informal areas (14.9%) indicated that the misuse of alcohol in their households was a very serious problem when compared to urban formal and rural informal (tribal) households. A similar trend was also found among head of households who indicated that the misuse of alcohol in their households was a serious problem but the differences were not statistically significant.

When the results were disaggregated by provinces, a higher proportion of heads of households from Mpumalanga (24%) indicated that the misuse of alcohol by a family member was a very serious problem when compared with those of households in other provinces (KwaZulu-Natal 9.3%, Gauteng 8.1%, North West 6.9% and Western Cape 6.2%). Significant differences were found in three provinces where head of households indicated that alcohol in their households was a serious problem. This was observed in Gauteng where a higher proportion of head of households (12.5%) indicated that the misuse of alcohol in their households was a serious problem when compared to Eastern Cape (4.6%) and Northern Cape (4.1%). An analysis by race showed differences among race groups. Significantly more heads of white households (84.1%) indicated that they did not perceive any problem of misuse of alcohol in their households when compared to the heads of both African households (57%) and Indian households (58.6%).

Nutritional status of adults

Dietary diversity and dietary intake are known to impact adversely on micronutrient status.

Vitamin A status of females of reproductive age

Overall, South African women of reproductive age had a vitamin A Deficiency (VAD) prevalence of 13.3%, reflecting a moderate public health problem of VAD. Although those aged 16–25 years had lower mean serum retinol concentrations (1.09 µmol/L compared to 1.10 µmol/L) and a lower prevalence of VAD (11.6% compared to 15.8%), these differences were not significant.

No significant urban–rural differences in mean retinol and VAD prevalence were found. However, the formal urban and rural formal areas had higher mean retinol concentrations and lower VAD prevalence, respectively. Western Cape had the highest mean retinol (1.24 µmol/L) and Limpopo the lowest (0.98 µmol/L), Gauteng was the second lowest (1.03 µmol/L) and similar to Mpumalanga and KuaZulu-Natal (1.04 µmol/L). The difference between the highest and the three lowest means was significant. Further, VAD prevalence was the lowest in Western Cape (7.1%) and differed significantly compared to Mpumalanga, which had the highest VAD prevalence (22.8%) among the provinces. The mean serum retinol concentrations inversely reflected the VAD prevalence, with the exception of Northern Cape, which had the same mean retinol (though with wider 95% CI and fewer numbers) as Western Cape (1.24 µmol/L). Limpopo, with the lowest mean retinol concentrations had the second highest VAD prevalence at 20.4%. This province had the least number of participants, as well as the widest 95% CIs.

Anaemia and iron status of adults

Micronutrient status, and iron in particular, is known to be important in haemopoiesis and on the prevalence of anaemia in adults and more specifically in women of reproductive age.

Anaemia in adults

Overall, the prevalence of anaemia in all participants older than 15 years of age was 17.5% with female participants having almost double the prevalence (22%) when compared with males (12.2%). Similarly, the prevalence of mild, moderate, and severe anaemia was respectively 11,6%, 5.3% and 0.6% with an overall statistically significant sex difference.

Mean Hb in adult males was 14.7 g/dL and the prevalence of anaemia 12.2%, mild anaemia was present in 10.6%, moderate in 1.5% and severe anaemia in 0.2% of males. Men aged 35–44 years had the highest mean Hb (14.9 g/dL) and the lowest prevalence of anaemia (7.0%), while those aged 65 and older had the lowest Hb (13.7 g/dL) and the highest anaemia prevalence, 25.9%.

Informal urban and informal rural areas had the lowest mean Hb levels, 14.2 g/dL and 14.3 g/dL, respectively. They were both significantly lower than urban formal areas. The Northern Cape had the highest mean Hb level (15.3 g/dL) and the lowest anaemia prevalence (3.5%). Limpopo had the lowest mean Hb (14.1 g/dL) while anaemia was most prevalent among males from Mpumalanga (18.6%) and Limpopo (16.8%).

Anaemia in females of reproductive age

Mean Hb was 12.8 g/dL and anaemia prevalence 23.1% in females 16–35 years of age, with the older women (26–35 years of age) having lower mean Hb (12.6 g/dL compared with 12.9 g/dL) and more anaemia than the younger group (24.2% compared to 22.3%). Combined moderate to severe anaemia was also more prevalent among the older group of women, 12.5% compared to 10.3%.

Although the differences were not significant, women living in urban informal areas had the lowest mean Hb concentration (12.5 g/dL), highest anaemia prevalence (31.5%) and combined moderate to severe anaemia (14.1%).

Iron status in females of reproductive age

Overall, iron deficiency (serum ferritin < 15 ng/mL) was present in 15.3% of women, with a mean ferritin of 65.3 ng/mL. Mean ferritin and prevalence of Iron depletion/deficiency (ID) were lower and higher, respectively, in the younger and older women of reproductive age (56.7 ng/mL compared to 78.1 ng/mL and 17.1% compared to 12.7%). Women from both formal and informal urban areas had lower ferritin concentrations (61.9 ng/mL and 63.4 ng/mL respectively), but not significantly so, and higher anaemia prevalence (16.1% and 17.2% respectively) than those living in rural areas. Mean ferritin was lowest in Limpopo (33.3 ng/mL), Mpumalanga (47.5 ng/mL), Gauteng (47.3 ng/mL), and Free State (55.1 ng/mL), which mean concentration levels were significantly lower than Eastern Cape and Northern Cape (88.5 ng/mL and 101.4 ng/mL, respectively). Black African women had a significantly higher prevalence (16.7%) of low ferritin concentration when compared with coloured women (7.3%).

Dietary diversity

The mean Dietary Diversity Score (DDS) across all age categories at the national level was 4.2, which is close to the cut-off level for dietary adequacy. The score did not differ significantly across the age categories. Four out 10 participants in the groups aged 15–24 years and 35–44 years had the lowest DDS. There were no significant differences between age categories.

Participants in urban formal areas had a significantly higher mean DDS (4.7) and the lowest percentage of participants consuming a diet of low diversity (29.3%). By contrast, twice as many participants in rural informal areas had a low DDS (59.7%).

Western Cape and Gauteng had the lowest number of participants with DDS < 4 (28.2% and 26.3% respectively), while North West (61.3%) and Limpopo (65.6%) had the highest number of participants with DDS. The mean dietary diversity score was significantly higher in white participants when compared with other race groups. The black African participants had the lowest dietary score and the highest number of participants with low dietary diversity (44.9%).

Dietary intake

Nationally, the mean fat score was 7.37 in males and 7.15 in females with nearly one out of five participants (18%) having a high fat score. The mean fat score decreased significantly with age from 7.94 in the youngest age group to 5.49 in 65 years and older age group, a pattern that was also similar in the percentage of participants who had a high fat intake. The young had significantly higher mean intakes than those of the older groups.

The mean fat score ranged from 5.57 in rural informal areas to 8.32 in urban formal areas. Half of the participants were low fat consumers in the rural areas (54.2% to 54.3%) with only a quarter of them having a low fat score in urban formal areas (23.6%). High fat users predominated in the urban formal areas (23.1%) the reverse being the case in rural formal areas (9.8%). The two urban categories had significantly higher fat intakes than the two rural areas of residence.

The highest rate of low fat users was in Eastern Cape (57.8%), Limpopo (55.3%), and North West (48.9%), with Gauteng having the lowest rate of low fat consumers (16.0%). The reverse was the case for high fat users. The mean fat score was highest in whites (8.54) compared to black Africans (7.09) and Indians (7.09). The highest percentage of low fat users were black Africans (36.8%) with only one out of three participants in the white group having a low (27.1%) and one out of four having a high (23.7%) fat consumption.

Dietary knowledge and beliefs

Health promotion provides information that can improve the population's knowledge; this has the potential to change people's beliefs and behaviours in relation to diet.

a) General nutrition knowledge
Overall, the mean general nutrition knowledge score of the survey's participants was 5.3 out of a total of 10 points. One in five participants (22.6%) achieved a high score, the majority (62.9%) achieved medium score and 14.5% achieved low scores. The knowledge tended to increase with age and peaked in the group aged 55–64 years.

With regards to locality, the mean score of adults for general nutrition knowledge was significantly higher in urban formal (5.4) compared with urban informal (5.05) and rural informal (4.97).

The mean general nutrition knowledge score for adults in the Western Cape was significantly higher (5.78) compared to scores in all provinces that had a score ranging from 4.65 to 5.39, except for Free State (5.6%). Black Africans had a significantly lower mean score (5.14) in comparison with all other race groups.

b) Beliefs regarding developing obesity

Overall, the majority of South African adults (74.7%) believed that *what you eat can make a difference in your chance of becoming fat*. They were followed by 74.5% of participants who believed that *starchy foods like bread, potatoes and rice make people fat*; 73.2% who believed that *What you eat can make a difference in your chance of becoming fat and getting diseases like heart disease or cancer*; 69.6% who believed that *how much you eat and drink can make a difference in your chance of becoming fat*, and 63.8% who believed that *the things I eat and drink now are healthy, so there is no need for me to make changes*. Three-quarters of the participants, therefore, believed that dietary habits do influence body weight. There were no significant differences by sex, and by age except in the group that believed that *what people eat can make a difference in their chance of becoming fat and getting diseases like heart disease or cancer*, the group aged 15–24 years had a significantly lower prevalence (70.1%) compared with the 65 and older age group.

By province, in the group that believed that *starchy foods like bread, potatoes and rice make people fat* Western Cape had the highest prevalence (85.2%) and it was significantly higher than prevalence in six other provinces ranging from 56.5% in the Free State to 76.2% in Gauteng.

When it comes to race, in both the group that believed that *starchy foods like bread, potatoes and rice make people fat* and in the group that believed that *what people eat can make a difference in people's chance of becoming fat* black Africans had significantly lower prevalence, 71.8% and 71.2% than the other race groups with prevalence for whites, coloureds and Indians ranging from 81.3% to 86%, and from 83.3% to 90.8%, respectively.

Dietary behaviour

Overall, almost half (48%) of adult South Africans reported that they ever ate outside the home. In terms of frequency, the majority reported they ate outside the home monthly (28.7%) weekly (28.3%). No significant sex differences found. The youth tended to, overall, eat outside home more frequently particularly the group aged 15–24 years.

Dietary practices

Overall at the national level, a higher proportion of males (54.4%) than females (23.6%) reported they did not do grocery shopping and the difference was statistically significant. Females had significantly higher prevalence than males in the majority of the studied factors considered when grocery shopping in relation to the price of the food items (64.5% compared with 35.9%), safety (9.6% compared with 5.2%), taste of food (17.5% compared with 10%), nutrient content (14.1% compared with 7.4%), how well/long the food item keeps (14.1% compared with 7%) and health considerations (14.3% compared with 7.3%).

The only significant differences between localities were seen in relation to the taste of food, convenience and the nutrient content, the prevalence being significantly higher in urban formal (respectively 12.2%, 8.4%, 8.9%) than rural informal settings (6.5%, 2.6%, 4.8%). Provincially, the price of food items was of a greater consideration in Free State with a significantly higher prevalence (44.6%) than Northern Cape (29.6%).

Body image and weight management

The dimensions of body image include the perception of body size status, the attitudes and dissatisfaction regarding body size status, the level and direction of body size dissatisfaction, as well as body size concerns.

a) Prevalence of happiness with current weight
Overall significantly more males (69.2%) than females (63.3%) were happy with their current weight and fewer males (13.3%) than females (18.1%) were unhappy with their current weight.

In the group that indicated they were happy with their current weight, there was a trend of decreasing prevalence of happiness with age in both males and females. However, only in males, was there a significant difference between those aged 15–24 year (75.2%) and all other age groups, except those 65 years and older (73.9%).

In the group that indicated they were happy, there were no significant differences in males across all provinces. However, in females, there was a significant difference between Western Cape (56.8%) and Northern Cape (72.4%).

The only significant difference in race groups occurred in the group that was happy with their current weight. In both males and females, Indians had the lowest prevalence (55.6% and 52.4%, respectively) compared to black Africans (70.4% and 65.5%, respectively). In addition there was also a significant difference between black African (65.5%) and white (53%) females.

b) Attempts to lose or gain weight in the last 12 months
Overall, significantly more South Africans (11.5%) attempted to lose weight than gain weight (8.6%) over the last 12 months. There was no significant sex differences among those who attempted to gain weight, however significantly more females (14.6%) attempted to lose weight than males (8%).

In males who attempted to gain weight, urban informal residents had a significantly higher prevalence (16.7%) compared to rural formal (6.6%) and urban formal (8%). In females, rural informal residents (10.8%) had a significantly higher prevalence than those in urban formal settings (6.4%)

There were no significant differences between localities for males who attempted to lose weight. For females, there was a significantly higher prevalence (18.2%) in urban formal settings compared to all other localities.

c) Ideal body image
Overall, 87.9% of South Africans indicated that their ideal body image was 'fat', while only 12% indicated that they had a normal ideal body image and 0.1% indicated they had a very thin ideal body image.

There were no significant differences for males across age, locality, province and race in all body image groups.

In females that had a normal ideal body image, the only significant differences were found in locality, between urban formal (15.6%) and rural informal (12%) and province, where females in Western Cape had the highest prevalence (23.2%) compared to all other provinces, and race groups, where black African had a lower prevalence (12.9%) compared to whites (22.9%).

In females who had a fat ideal body image, the only significant difference occurred provincially. Western Cape had the lowest prevalence (76.5%) compared to all other provinces except KwaZulu-Natal (84.5%) and Free State (80.4%)

d) Correctness of perception of body image

While, more than 96% of South Africans were able to correctly identify a 'thin' and 'fat' body image based on body image silhouettes, only 9.6% and 14.2% of males and females respectively were able to correctly identify a 'normal' body weight image with females being significantly more likely to identify normal body weight than males.

There were no significant differences between age, locality and race. However , there was a significant difference amongst females in Western Cape (23.2%) compared to those in the Mpumalanga, Limpopo, Gauteng, North West where the prevalence was less than 13%.

e) Perceived compared to ideal BMI

Overall 41.9% of South Africans perceived BMI was equal to their ideal BMI, with the remaining 27.8% and 30.3% perceived BMI higher and lower than their ideal BMI respectively.

While a similar percentage of males (43%) and females (40.9%) indicated their perceived BMI as equal to their ideal BMI, significantly more females (33%) than males (22%) indicated their perceived BMI to be higher than their ideal BMI and significantly fewer females (26.1%) than males (35%) indicated their perceived BMI to be lower than their ideal BMI.

In both males and females in the group whose perceived BMI was higher than their ideal BMI, respondents from urban formal areas (26.6% and 39.3%, respectively) had a higher prevalence than those in rural informal areas (13.5% and 23.4%, respectively).

f) Perceived BMI compared to actual BMI

Overall 32.4% of males' and 43.2% of females' perceived BMI was indeed equal to their actual BMI and the differences were significant. Significantly more males (37.3%) perceived themselves to have a larger BMI than they actually had, compared to 20.8% of females.

There were no significant differences between age groups for those people whose perceived BMI were equal to their actual BMI. However, amongst both males and females, who perceived their BMI to be larger than their actual BMI, the prevalence tended to decrease with increasing age. Further, the only significant difference occurred between those males aged 15–24 years (41.2%) and those aged 55–64 years (23.4%) and those females aged 15–24 years (32.7%) with all other age groups (less than 19%).

There were no significant differences between localities for those people whose perceived BMI was equal to their actual BMI. The only significant difference occurred amongst males in the urban formal (32.7%) and urban informal (49%) settings whose perceived BMI was higher than actual BMI. No significant difference between race groups in all categories

g) Perception of own body image

Overall, 76.4% of South Africans perceived that they had a 'fat' body image, while less than a quarter (22.7%) and only 0.9% thought they had a 'normal' body image and a 'very thin' body image, respectively.

The perception of normal body image tended to decrease with age in both sexes. Of those that identified themselves as having a 'normal' body image, both males and females in aged 15–24 years old were significantly more likely (33.2% and 30.5%, respectively) to perceive that they had a 'normal' body image than those in the other age groups (less than 24% and 21% respectively). There were no significant differences in locality for both males and females in all three groups.

In males, there were no significant differences between race groups in the group that perceived they had a very thin body image. However, among those who perceived they had a normal body image, black Africans had a significantly higher prevalence (26.6%) than all other trace groups except coloureds (20.6%). Among those who perceived they had a fat body image, black Africans (72%) had a significantly lower prevalence than the other race groups.

Child health

Child health and nutritional status are fundamentally related in terms of growth and attendant health outcomes.

Anthropometry

Anthropometry provides the single most inexpensive and non-invasive means for assessing growth, a critical determinant in child health. Data on weight, height and derivative indices are presented in this section.

Body weight and height

South African girls were significantly heavier than boys (27.2 kg compared with 24.8 kg); they were also marginally taller than boys, but not significantly so (118.9 cm compared with 117.5 cm). Weight and height increased with age, with boys being heavier and taller until the age of five years, whereafter girls were heavier and taller. Boys living in urban formal areas were significantly heavier (26.1 kg)) than those living in rural informal areas (22.7 kg). They were also taller (119.7 cm) than all the other race groups. The same pattern applied to girls, although the differences were not significant. KwaZulu-Natal, followed by Gauteng (26.4 kg and 26.1 kg respectively), had the heaviest boys and North West the lightest boys (22.1 kg). The same pattern for girls' weight was seen among the provinces, with KwaZulu-Natal and Gauteng having the heaviest girls (29.3 kg and 28.6 kg). The lightest (24.6 kg) and shortest (111.0 cm) girls were in the Free State. No significant difference between black African and coloured children with respect to mean weights and heights were found.

Body mass index

South African boys had a mean BMI of 17.0 kg/m^2, which was not significantly different than that of girls (17.7). The prevalence of overweight and obesity was significantly higher in girls than boys (16.5% and 7.1% compared with 11.5% and 4.7%, for girls and boys, respectively). The percentage of normal and underweight children was significantly greater among boys than girls (83.8% compared with 76.4%). Overall, mean BMI increased with age in boys and girls. Girls had higher prevalence rates than boys for overweight and for obesity at all ages. Between age group differences for overweight and normal/ underweight were significant for boys only. Overweight and obesity was highest in urban formal (11.8% and 5.4% for boys; 19.4% and 8.9% for girls, respectively) and informal areas (20.0% and 5.2% for boys; 20.8% and 9.3% for girls, respectively), and lowest in the rural informal areas (9.0% and 2.5% for boys; 10.7% and 6.3% for girls respectively). For boys, Mpumalanga, KwaZulu-Natal, and Gauteng had the most obesity (6.1%, 6.1%, and 5.3%) while North West, Limpopo, and Eastern Cape had the least (2.7%, 3.3%, and 3.7%). For girls, obesity was highest in Gauteng, KwaZulu-Natal, and Western Cape (10.0%, 8.5%, and 7.25%) and lowest in Northern Cape, North West and Limpopo (3.5%, 4.3% and 4.3%). Black African girls had a significantly higher mean BMI when compared with black African boys.

In terms of undernutrition, the youngest boys and girls (0–3 years of age) had the highest prevalence of stunting (26.9% and 25.9% respectively), which was significantly different from the other age groups, with the lowest prevalence in the group aged 7–9 years (10.0% and 8.7% for boys and girls, respectively). Among boys, rural informal areas had significantly more stunting (23.2%) than urban formal areas (13.6%). Girls living in urban informal areas had the highest prevalence of stunting (20.9%) and those in urban formal areas, the lowest (10.4%), the difference in prevalence being significant. Boys living in North West, Mpumalanga, and Northern Cape had the highest stunting prevalence (23.7%, 23.1% and 22.8%, respectively). Girls in Free State, North West, and Eastern Cape were most stunted (22.1%, 17.8% and 15.6%). Among the race groups, coloured children (boys and girls) were most stunted (18.6% and 16.1%) and coloured girls most underweight (9.8%).

Nutritional status of children

Poor micronutrient status, especially with regard to vitamin A and iron, is common among young children.

Vitamin A status of children under five years of age

The mean serum vitamin A of children under five years, was 0.72 µmol/L (males) and 0.79 µmol/L (females) younger and older than two years of age respectively. Vitamin A deficiency (VAD) was found in 49.3% males and 39% females younger and older than two years of age, respectively. The sex difference was significant. At the national level, the VAD prevalence was 43.6%. Children in urban formal areas had the highest mean retinol concentration and the lowest VAD prevalence (0.82 µmol/L and 31.9%), while the opposite was true for urban informal areas (0.69 µmol/L and 55.1%), respectively. Only three provinces had sample numbers above 50: Western Cape, Eastern Cape, and North West. This prevented making meaningful comparisons with the other provinces. The respective mean retinol concentrations and VAD prevalence for the three provinces were 0.78 µmol/L and 43.6%; 0.76 µmol/L and 41.1%; and 0.67 µmol/L and 57.1%, respectively. Mean serum retinol was significantly different between Western Cape and North West. Despite the small number of the provincial samples and the consequent limitations of the interpretation of the finding, all provinces had a prevalence higher than 20%, which according to the WHO classification, is indicative of a severe problem of public health significance of VAD in the country. Black African children had the lowest mean retinol concentration (0.74 µmol/L) and the highest VAD prevalence (45.4%) while coloured children had a mean retinol concentration of 0.81 µmol/L and prevalence of 33.4%. None of these differences were significant. In comparison with the with previous national surveys, the current survey indicates that a decrease in the national prevalence of VAD of 20% and a 17% increase in mean retinol, which may be related to the food fortification programme enacted in 2003.

Anaemia iron status in children under five years of age

Overall mean Hb was 12.2 g/dL and mean ferritin 40.8 ng/mL. Anaemia was present in 10.5% of the children, iron deficiency in 11% and iron deficiency anaemia in 2.1%. While no children had severe anaemia (Hb < 7 g/dL), mild and moderate anaemia was present in 8.4% and 2.1%, respectively. Although not significant, there was a trend for ferritin concentrations to be higher among rural compared to urban children. The findings of the present survey indicate that anaemia and iron status have improved substantially among children under five year of age in South Africa since the last national survey in 2005; an improvement that may also be related to the food fortification programme enacted in 2003.

Dietary knowledge

Non-communicable diseases (NCDs) and risk factors for NCDs affect people of all ages including children.

General nutrition knowledge

Overall, the mean general nutrition knowledge score achieved by children was 1.8 out of a total of 6 points. The majority (71.7%) had low scores, 27.3% had a medium score while only 0.9% achieved a high score. There were no significant differences in nutrition knowledge amongst children by sex and localities. Children in Western Cape had a significantly lower prevalence (63.3%) of low general nutrition knowledge scores compared to Eastern Cape, Free State and North West (76.3% to 81.7%). However, Western Cape had a higher prevalence of medium general nutrition knowledge scores (36%) compared to Eastern Cape, Free State and North West (18.3% to 22.8%). There were no significant differences between provinces in the group that achieved high scores. There were also no significant differences in general nutrition knowledge by race.

Correct identification of healthy alternatives

Overall, the mean score achieved by children for the correct identification of healthy alternative was 5.1 out of a total of 7 points. The majority (53.2%) had high scores, 38.2% had a medium score while 8.6% achieved a low score. There were no significant differences in the correct identification of healthy alternatives by sex.

Correct identification of foods containing healthy fats

Overall, the mean score achieved by children for the correct identification of foods containing healthy fats was 5.4 out of a total of 10 points. The majority (69.2%) had medium scores, with remainder equally distributed between low scores (15.4%) and high scores (15.4%). There were no significant differences in the correct identification of foods by sex. There were no significant differences between localities in the group that achieved low scores for correct identification of foods containing healthy fats. In the group that achieved medium scores, children, in rural informal settings had a significantly higher prevalence (75.6%) compared to urban formal (65.8%) and rural formal (62.4%) settings. In the group that achieved high scores, children in the rural informal had a significantly lower prevalence (10.5%) compared with urban formal (18.3%) setting .

Dietary behaviour

Overall, the mean score achieved by children with regard to their perceived ability to change their dietary behaviour was 6.7 out of a total of 10 points. Slightly more than half (51%) of the children achieved a high score, 30.2% achieved medium score and 18.8% achieved low scores. There were no significant differences by sex, race and locality.

Dietary practices – breakfast

Overall, more than two-thirds of children (68.4%) indicated that they ate breakfast before school and 19% indicated that they did not eat breakfast before school. The majority of children (86.1% and 89.3%) indicated that they believed it was important to have breakfast because it helped them concentrate better at school and because it helped to give them energy for the day respectively. There were no significant differences by sex, race and locality

Reasons for not having breakfast at home

The most common reason given by children aged 10–14 years for not having breakfast at home was not being hungry early in the morning (39.2%); not having enough food in the house (33.9%), people at home not having breakfast (33%), cannot get up early enough (19.2%) and lastly cannot make their own breakfast (15.3%). There were no significant differences by sex for any of the five possible reasons but variations were found locality and province.

Dietary practices – lunch boxes

More than half (51.1%) of children aged 10–14 years indicated that they did not take a lunch box to school and only 37.6% of children indicated that they did. There were no significant differences in lunch box practice by sex. Children in rural informal setting were significantly less likely (25.3%) to take lunch boxes to school than children in urban formal (47.6%) and urban informal (40%) settings. Overall, the most common reason indicated for not taking a lunch box to school was that the food at school was enough for the whole day (37.2%), followed by nothing at home to put in the lunchbox (29.8%), no one at home to help make lunch (18.3%), other children will want their food (18%) and lastly not having a nice container (17.1%).

Frequency and amount of money taken to school

Overall, 51.3% of children indicated that they take money to school, 33.2% indicated that they did not and 15.5% indicated that they sometimes took money to school. Of those who took money to school, 48.6% took money to school every day and 51.4% took money to school two or three times a week. There were no significant differences by sex for both taking/not taking money to school as well as the frequency of taking money to school. Children in rural formal settings had a significantly lower prevalence (30.3%) of taking money to school than children in both urban formal (50.8%) and rural informal (58%) settings. The mean amount of money children took to school on any given day was R5.75. The majority of children (76.5%) took R0–R5 to school, followed by those who took R5.50–R10 (16.2%); those who took R11–20 were in the minority (5%). Only 2.4 % of children took more than R20 to school on any given day. There were no significant differences between boys and girls in the mean amount of money and all categories of possible amounts of money taken to school. Some differences were observed by province and locality.

Body image and weight management (10–14 years)

Body image has been defined as the perception of overall physical appearance and is considered as a major component of global self-esteem

Happiness with current weight

The majority of all children, 82.2% of males and 78.3% of females, indicated that they were happy with their current weight. Overall significantly more females (13.8%) than males (8.8%) were unhappy with their current weight. There were no significant differences by locality for males in all three groups.

Attempted to lose or gain weight in the last 12 months

Overall, 14.9% and 13.5% of all children (males and females) attempted to gain or lose weight, respectively. No significant sex differences were observed between those children who attempted to gain weight. However, a significantly higher number of female participants (16.7%) attempted to lose weight when compared with males (10.3%). No significant differences by locality were observed between those children who attempted to gain weight. However, a significantly higher percentage of children in the urban formal settings (16.6%) attempted to lose weight compared with children in the other locality settings (7.4%). Provincially, a significantly higher prevalence was found of children in Western Cape (29.1%) who attempted to gain weight compared with children in KwaZulu-Natal (12.8%), North West (6.9%), Gauteng Province (9.8%) and Mpumalanga (11.2%).

Ideal body image of children

More than three-quarters (76.5%) of all children aged 10–14 years, perceived themselves to have a ‘fat‘ body image, while only 21.9% perceived they had a normal body image, and 1.6% perceived they had a very thin body image. There were no significant differences by sex between the three groups.

Correct identification of body image from body image silhouettes

Overall, 98.1% and 99.6% of children aged 10–14 years were able to correctly identify a ‘very thin’ and a ‘fat’ body image respectively from body image silhouettes. There were no significant differences by sex, locality, province and race for children in these groups. However, only 18.2% of children were able to correctly identify a ‘normal’ body image and there was no significant difference by sex for this group.

Perceived compared to deal BMI of children

Nearly half (46.3%) of children’s perceived BMI equalled their ideal BMI, 36.6 % of children’s perceived BMI was lower than their ideal BMI, while 17.1% of children had a perceived BMI higher than their ideal BMI. There were no significant sex differences in either of the three groups.

Perceived BMI compared to actual BMI

When comparing perceived BMI with actual BMI of children aged 10–14 years, there were no sex significant differences. However, more children perceived their BMI to be higher than their actual BMI (males 12.7% and females 16.2%) compared to 3.9% of males and 5.1% of females whose perceived BMI equalled the actual BMI, and 0.2% of males and 0.6% of females whose perceived BMI was lower than their actual BMI.

Perception of own body image of children

Overall, while only one out of three children (36.4%) perceived they had a normal body image, nearly two-thirds (61.6%) perceived themselves to have a ‘fat‘ body image, and only 2% perceived to have a ‘very thin’ body image. There were significant differences by sex in the group who perceived they had a normal body image (42.4% males compared to 30.5% females) as well as those who perceived they had a fat body image (55.3% males compared to 67.7% females).

Perceptions of general health

Health status is an individual's relative level of wellness and ill-health, taking into account the presence of biological or physiological dysfunction, symptoms and functional impairment

Health status and difficulties with work or household activities

Health perceptions (or perceived health status) are the subjective ratings by an individual of his or her health status

Health status

Participants rated their overall general health in various categories that ranged from good/very good to bad/very bad. This self-rating was an indication of the individual's perception level of overall functioning with respect to their physical and mental health. The percentage of participants who rated themselves in each category was: 37.1% as very good, 41.5% as good, 16.2% as moderate and 5.1% as bad to very bad. The majority of participants' reported having very good to good health.

Difficulties with work or household activities

In order to measure the impact of health on a person's functioning participants were asked how much difficulty on average they have in carrying out work or household activities because of a health condition in the last 30 days. Overall, 25.6% had at least some difficulty with work or household activities, with most within that group rating their difficulty as mild (15.5%). The proportion of those with severe or extreme difficulty was generally low at 2.6%. As expected self-reported difficulty in functioning increased with age for extreme difficulty, 1.2% among those aged 15–24 years and 9.1% in persons 65 years and older. There was variation in extreme self-reported difficulty in functioning among provinces, ranging from 5.5% in the Free State to 1.5% in North West. The African population seemed to have higher self-reported difficulty in functioning than white and coloured groups.

WHODAS and activities of daily living

The WHO-Disability Assessment Scale (DAS) score provides an indication of the overall level of self-reported disability in a defined time period preceding an interview.

Disability (WHODAS)

In SANHANES-1, a very low level of disability was reported at all ages, including the middle- and older age group although the results show a trend of increasing disability with age. Reported levels were negligibly low with a mean percentage of 5.5 for both males and females with females reporting a slightly higher level of disability at 6.4% and those in the 65 years and older group reporting the highest level of disability at 18.2%. The significant differences were found by age groups, locality and province: the age group 15–24 years (3.7%) was lower than the 45–54 years (6.3%) the group 55–64 years (8.8%) and 65 and older years (16.2%); the rural informal (6.9%) had a higher level of disability than the urban informal (4.7%) and the rural formal (3.4%); black Africans (5.9%) had higher than coloureds (3.5%); Western Cape (2.9%) had lower disability rate than Eastern Cape (5.6%), Northern Cape (6.4%), Free State (7.1%), KwaZulu-Natal (7), North West (5.1%), Mpumalanga (8.5%), and Limpopo (6.8%), and finally, Mpumalanga had a higher level of disability than Gauteng (4.6%).

Activities of Daily Living (ADL)

About 69.8% of the participants did not have any difficulty in carrying out daily activities and males were more likely to have no difficulties compared to females (74.8% and 65.4%, respectively). The difficulty in carrying out daily activities significantly increased with age, for instance, the age group 65 years and older were more likely to experience more than two limitations in carrying out their daily activities while those in the group aged 55–65 years were more likely to experience at least one limitation compared to younger groups. This was the same among both males and females, but females were more likely to experience two or more limitations compared to males (59.1% and 48.8%, respectively). Living in a rural formal area was associated with no difficulties (77.8%) in carrying out daily activities and this was significantly different at a 5%-level to those living in a rural informal area (66%).

Vision and hearing

The ability to see and hear is fundamental to adequate social and occupational functioning

Self-report on using glasses or contact lenses for near-sightedness

Significant differences were observed in self-reporting near-sightedness across the following groups: the age categories 15–24, 25–35 and 35–44 years had significantly lower prevalence of near-sightedness as compared to the 45–54, 55–64, and 65 years and older age categories; those aged 15–24 (4.9%) had lower prevalence than those aged 35–44 (8.1%), 45–54 (19.5%), 55–64 (32.3%) and 65 years and older (34.8%); participants from the urban formal areas (16.2%) had higher prevalence for near-sightedness than those participants from the urban informal (5.2%), rural informal (6.2%) and rural formal areas (9.4%); black Africans had lower prevalence (7.8%) than whites (32.7%), coloureds (18.9%) and Indians (32%); and finally whites and Indians reported higher prevalence figures than coloureds.

Self-report on using glasses or contact lenses to see close up (far-sightedness)

Significant findings for the prevalence of far-sightedness were observed across the following groups: the group aged 15–24 years (7.2%) was significantly lower than the groups aged 35–44 years (11.5%), 45–54 years (22.1%), 55–64 years (32.5%) and 65 years and older (35.2%); participants in the urban formal areas (17.4%) were significantly higher than urban informal (8.2%), and rural informal (9.6%) areas; black Africans had significantly lower prevalence rates (10.3%) than whites (31.4%), coloureds (22%) and Indians (31.8%).

Self-report on using a hearing aid

The prevalence of self-reported hearing impairment varied across race and province: Indians (13.5%) had a higher prevalence than coloureds (7.2%). The Free State (14.3%), KwaZulu-Natal (13.6%), Eastern Cape (10.8%), Mpumalanga (10.3%), Limpopo (10.5%), and Western Cape (9%) reported a higher prevalence than Northern Cape (4%); Free State and KwaZulu-Natal were higher than Gauteng.

Psychological distress, experience of traumatic events and post-traumatic-stress disorder (PTSD)

Post-traumatic disorder is defined as an anxiety disorder that may develop after exposure to a life threatening event or ordeal where severe physical harm occurred or was threatened

Psychological distress (Kessler-10, K-10)

The mean K10 score of the total sample was 14 and it was higher for females (14.4) compared to males (13.5). About 31.4% of females compared to 25% males reported experiencing distress. The mean K10 scores increased as age increased and participants aged 65 years and older had the highest mean K10 score (16), significantly different compared to other age groups. Overall, about 42.6% of participants in the group aged 65 years and older were distressed; this was significantly higher than all other age groups except the group aged 55–64 years. Those living in rural informal areas were slightly more likely to have a higher mean K10 score (14.4) and thus were more distressed (32.5%) compared to other areas; however, these findings were only significantly higher than the results for rural formal (farm) areas.

Intensity of psychological distress

With regards to the intensity of psychological distress experienced in the 30 days preceding the interview, overall the majority of participants (83.3%) had low, while 10.3% had moderate intensity. A smaller proportion of the sample had high intensity (4.2%) and 2.2% had very high intensity of psychological distress. An analysis by sex showed that males had a significantly higher level of low distress compared to females. Participants over the age of 65 had a significantly high or very high distress level compared to all other age groups except those aged 55–64 years. Very high psychological distress did not differ with regards to geotype.

Experience of traumatic events

Family-related trauma followed by personal assaults was the most common traumatic events experienced by the participants. It was found that 14.8% of participants had experienced family-related trauma and 10.2% had been victims of personal assault. About 9.2% reported experiencing other traumatic events and only 3.1 % had experienced war and terrorism (3.1%). There was a significant difference between respondents aged 55–64 years (10.8%) and those aged 15–24 years (6.7%) in reporting lifetime experiences of ‘other’ traumatic events, with the older age group reporting higher levels of trauma in this category.

Symptoms associated with post-traumatic-stress-disorder (PTSD)

The rates of symptoms of PTSD reported are based on the percentage of participants that reported being symptomatic for PTSD in the week preceding the interview. It was found that 41.4% were symptomatic for PTSD and 58.6% had no symptoms. The majority of those who were symptomatic for PTSD were Asians/Indians (47.2%) and coloureds (47.1%), followed by black Africans (42.2%). These differences were not significant.

Prevalence of PTSD

The overall prevalence of lifetime post-traumatic stress disorder was 11.1%; this was highest among the coloured population group 13.7%, followed by black Africans (11.2%) and Asian/Indians (7.7%).

Use and perceptions of the quality of health care services

The SANHANES-1 study included questions on health care utilisation and perceptions of health care services.

General health care

On average, respondents sought care in the private sector 1.8 years prior to the study. Females on average had sought care in the private sector 1.6 years earlier, while males had last received health care in the private sector 2.0 years earlier on average. Residents of rural informal areas were significantly less likely than urban formal residents to seek care in the private sector, but there were no significant differences in duration since the last visit to a private health facility.

Mean duration (years) since health care was last received from the public health sector

On average, the last time respondents ever needed care in the public sector was about 2.0 years prior to the study, a figure that is not statistically significantly different from the 1.8 years in the private sector. There were no significant differences by sex in mean duration since last seeking care in the public sector. The results show that 45.8% of the respondents who needed health care had ever used the public sector. Females (52.4%) were statistically significantly more likely to have reported ever seeking care in a public health facility compared to males (38.6%). Young adults aged 15–24 years were less likely to seek health care from the public sector than all adult groups aged 55 years and older. However, in comparison with the private sector, a higher percentage of young adults aged 15–24 years received health care in the public sector (40.5%) than in the private sector (26.7%). Adults aged 65 years and older (58.9%) and those aged 55–64 years (55.7%) were significantly more likely than all age groups younger than 45 to seek health care from the public sector (below 46%).

Accessing needed health care services

The study assessed the extent to which the participants received care when needed. The results showed that the majority (96.8%) of respondents over the age of 15 were able to access services when needed. Rates did not differ when analysed by sex, age, locality, or province.

Analysis of data by race showed that although access to health care was higher than 95%, there were racial disparities in access to needed health care. All the races accessed needed services at a significantly higher rate than black Africans.

Reason(s) for seeking care at last visit to a health care facility

Over a third of respondents reported that their reason for needing care from a doctor or hospital the last time was due to an acute condition (38.4%) and ‘other’ condition (40.3%). A lower proportion of respondents (18%) reported a chronic condition as their reason for needing care; this was significantly lower than acute or ‘other’ reasons ($p < 0.05$). Only a very small proportion of respondents (3.3%) reported a communicable condition as their reason for needing care, significantly lower than all three other reasons (acute, ‘other,’ and chronic) ($p < 0.05$).

An analysis of data by sex showed that males (40.3%) tended to seek care for acute conditions at a higher level than females (37.1%), while females sought care for chronic conditions significantly more than males (19.9% compared to 15.3%) and males were twice more likely than females to seek care for communicable diseases (4.7% compared to 2.4%), which was statistically significant ($p < 0.05$). Seeking chronic disease care was positively correlated with age.

Inpatient care utilisation patterns

Nine percent (9.1%) of the population aged 15 years and older received inpatient care in the 12 months before the interview. However, females (10.8%) were significantly more likely than males (6.8%) to have been inpatients at a health facility once within a year. A small proportion stayed in an inpatient facility more than once. Residents of urban informal areas were significantly less likely than residents in rural informal areas to have stayed in inpatient facilities. However, there were no significant differences by age or race in inpatient stays.

Type of facility inpatient care was last received

Less than three quarters (71%) of the population who received care in inpatient facilities received it in public hospitals as opposed to private hospitals. The rate of use of inpatient care services did not significantly vary according to the sex of respondents even though females (72.4%) were more likely to use health facilities as inpatient than males at 68.3%. Respondents living in rural informal (89%) and urban informal (89.4%) areas used public health services at greater rates compared to those living in rural formal (65.2%) and urban formal (63%) residents. Although urban formal residents had greater access to private health services, there was no significant difference between rural formal (34.8%) and urban formal (35.7%) residents in the use of private hospitals for inpatient care. Whites at 64.8% were three times more likely to use private hospitals than black Africans at 19%. Levels of use of private inpatient care services did not vary among Indians (49%) and coloureds (29.9%).

Reason inpatient care was last needed

Among the respondents who received inpatient care, the reasons for care varied: acute conditions (17.1%), chronic conditions (20.1%) and a very small percentage for communicable diseases (3.6%) and the rest (59.2%) indicated ‘other’. There were more males than females who needed inpatient care for acute condition (males 19.1%; females 16.1%), chronic conditions (males 24.6%; females 17.9%) and communicable conditions (males 4.8%; females 3%). However, there were more females (63%) than males (51.5%) who needed inpatient care due to conditions classified under ‘other’ category. The reason for inpatient care for young people aged 15–34 years were mainly acute conditions and ‘other’. Adults 35 years and above primarily needed inpatient care for chronic conditions followed by acute conditions. There were no significant differences in the reasons for seeking inpatient care between rural and urban areas for acute, chronic, communicable and other conditions or diseases. There was also no significant difference in the reasons for inpatient care among the different race groups for all disease categories, acute, chronic, communicable and other.

Source of payment for last inpatient visit

Payments for the last inpatient health care for participants over the last 12 months were contributions from the medical aid (25.3%), followed by out-of-pocket (17.9% total, 11.4% respondent and 6.5% family member) and other (11.3%) while the rest was free of charge (47.5%).

There was a difference in the use of medical aid to pay for inpatient care in the different provinces. Western Cape, Free State and Northern Cape residents were more likely to pay for inpatient services using medical aid, which was less so for the rest of the provinces, especially North West, Limpopo and Gauteng. Residents of the North West, Gauteng and Limpopo were more likely than all the other provinces to obtain free health care services.

Residents of KwaZulu-Natal were more likely than other groups to pay for out-of-pocket expenses (12.3% self-payment, and 14.9% by family, for a total of 27.2%). Because the individuals are likely to use more than one source to pay for health services, it is not possible to compute confidence intervals or other statistical tests to assess the significance of the differences.

Medical aid as a source of payment for inpatient care was mainly used by residents in urban formal participants (33.1%) while urban informal residents (65.9%) used free of charge health care. There was no differences in the use of free inpatient care over the last 12 months between the rural formal (57.9%) and rural informal (54.7%). However, rural informal residents were more likely to pay for inpatient services out of pocket than their counterparts.

Overall satisfaction of inpatient care at the last visit

The majority (85.5%) of the participants were very satisfied or satisfied with the inpatient care received at the last hospital visit. There were more male than female participants who were very satisfied or satisfied (87.5% compared to 84.4%). All provinces registered more than 80% satisfaction with the Western Cape reporting the highest (91%) and Limpopo the lowest (81%) inpatient satisfaction at the last hospital visit. There were no significant differences among the different age groups in relation to their satisfaction with the inpatient care received in their last hospital. Analysis of the overall satisfaction according to race indicates that Indian respondents (96.4%) were more satisfied with inpatient care at the last visit than the other groups with blacks Africans being the lowest (83.4%) amongst all the groups. There was no significant difference in satisfaction amongst the different locations. However, there were more rural formal residents (95.5%) who were satisfied with inpatient care at last visit than residents from other localities.

Utilisation patterns of outpatient care

Slightly more than 38% of participants aged 15 years and older received outpatient care, which may have been received at a hospital outpatient department, health centre, clinic, private offices or at home. Use of services did not differ significantly by sex, but differences were found when analysed by age. As expected, age was positively associated with use of services; in this case it was positively associated with outpatient care use. Younger South Africans (aged 15–24 years) had significantly lower rates of use of outpatient services than the group aged 65 and over (33.0%). Although there were variations in use of outpatient services by locality type, with rural formal residents were more likely than all their counterparts; the differences were not statistically significant.

Frequency of outpatient care in the past 12 months

Of the population aged 15 years and older, 40% received outpatient care once in the last 12 months. Males were significantly more likely than females to have received outpatients care only once in the past year. As anticipated, young people aged 15–24 years were more likely to use outpatient health services only once a year compared to those aged 65 years or older. The older population (aged 55–64 years and 65 years and older) were not significantly less likely than all other age groups to use the outpatient services once; often using it more than once.

Type of facility outpatient care last received

Analysis of outpatient service utilisation showed that, among outpatient users of health care, most used public health facilities (62.7%), with few seeking care in private health facilities (35.4%). Further analysis by sex and age of respondent showed no significant differences in the type of facility accessed: (males 58.1% and females 65.6%) in the public sector. Urban formal residents were 2.7 times more likely than urban informal residents and 2.6 times more likely than rural informal residents to use the private sector for health care ($p < 0.05$). Western Cape residents (47%) reported the lowest rate of public health facility use for outpatient care compared to other provinces. Black Africans, coloureds and Indians used outpatient services in the public sector at a significantly higher rate than whites. Black Africans were 4.1 times more likely than whites to use outpatient services in the public sector. Coloureds and Indians were 3.3 times more likely than whites to use outpatient services in the public sector.

Reasons for seeking outpatient care at the last visit

A third (32.4%) of respondents sought care for acute conditions, slightly less than a third (27%) for chronic conditions and a very small percentage for communicable diseases. The remainder sought care for other conditions (such as maternal and perinatal conditions, nutritional deficiencies, surgery and injury). The reasons for seeking care did not differ by sex of the respondent regardless of the presenting condition. The elderly (65 years and older) were significantly less likely than the rest of the age groups to seek care for acute conditions, instead they were more likely to seek care for chronic conditions. As expected there was a significant association of age and chronic conditions as presenting problems in outpatient facilities in the study population. Participants in urban areas were more likely to seek outpatient care for acute conditions than rural participants who were more likely to seek outpatient care for chronic condition.

Source of payment for last outpatient visit

The study found that payments for the last outpatient health care for participants aged 15 years and older over the last 12 months were contributions from the medical aid (20.2%), followed by out-of-pocket (18.7%, that is, 15.2% self-paying and 3.5% paid by family), other (4.3%) and the rest were free of charge at the point of care (57.7%). More males (22.7%) than females (18.3%) paid through the medical aid. More females (60%) than males (52.9%) received free outpatient care. Medical aid as a source of payment for outpatient care was mainly used by residents in urban formal areas (29.8%) while urban informal residents (70.5%) used health care for free. The urban informal and rural informal area residents had a miniscule proportion of the population paying for outpatient care through medical aid. There was no significant difference in the use of free outpatient care over the last 12 months between the rural formal (56.9%) and rural informal (57.4%). There was however a significant difference in the use of medical aid to pay for outpatient care in the different provinces.

Satisfaction with health care services

An overwhelming majority (85.4%) and (86%) of the participants were satisfied with inpatient and outpatient health care services needed, respectively. However, in contrast to these findings, the participants were less satisfied with the way services were managed in their areas and also less satisfied with how health care was provided. Furthermore, the participants were less satisfied with health services (71.3%) and health provision (69.3%) in their area.

Satisfaction with public compared to private inpatient health care services

The study results show that although public sector users were less satisfied (83.1%) than private sector users (92.1%), the differences were not statistically significant. Males compared to females appear to be slightly less satisfied with inpatient public health care; however, the differences were not statistically significant.

Satisfaction with inpatient health care services

Satisfaction levels were high among those who received inpatient care in hospitals. The dissatisfaction levels were very low (6%) as were the levels of those who did not express an opinion. There were no significant sex differences in the level of satisfaction with inpatient care services received at hospitals. Although users of inpatient services were satisfied with the health services they received, persons aged 45–54 years were the most satisfied compared to all other groups, but differences were not statistically different.

Further analysis of data by locality did not show any significant differences in satisfaction levels with inpatient hospital care. Comparisons by respondents' province of residence were not statistically significant despite considerable provincial variation. Analysis of satisfaction level data by race showed no significant differences in perception of care obtained in inpatient health care facilities between any races.

Satisfaction with outpatient care

Overall satisfaction with outpatient care among participants was high at 86%. There was no significant difference in satisfaction among male and female participants, different age groups and between urban and rural participants. There was also no significant difference in satisfaction with outpatient care in the different provinces except for North West where only 63.1% were satisfied with outpatient care they received. Black Africans (83.2%) were statistically significantly less satisfied than whites (96.4%) with their outpatient care experiences.

Rating of the way health care was provided in the area of residence

The rating of satisfaction with the way health care was provided in the area of residence was also high with 68.2% of respondents rating the way health care was provided as very good and good. Results did not vary significantly when analysed by sex, age and locality. Analysis of the rating according to race showed that the majority (84.2%) of the white respondents compared to the Indian respondents (66.6%) rated the way health care was provided as very good and good. In the analysis by province, North West reported the lowest rating (46%) of the health care provided in the area of residence compared to all other provinces with more than half to three-quarters of respondents rating them very good and good.

Satisfaction with outpatient care service provision, public compared to private

Positive perceptions of health care provision indicated good quality health care. Overall, 86% of participants were very satisfied or satisfied with outpatient care (public or private). The majority of those seen in the public sector were less satisfied overall; the satisfaction level with outpatient public care received was 80.1% compared with 96.1% for participants seen in the private health sector. The rate of very satisfied was much higher in the private sector than in the public sector (57.1% compared to 24.5%) ($P < 0.05$). The level of dissatisfaction in the public sector was low, at 8.5%, which was significantly lower than in the private sector at 0.8%.

Satisfaction with inpatient health care service provision, public compared to private

Overall, 85.2% of participants were very satisfied or satisfied with outpatient care (public or private). The satisfaction level with inpatient public care received was 83.1% compared with 92.1% for participants seen in the private health sector. The rate of very satisfied was much higher in the private sector than in the public sector (69.5% compared to 32.7%); however the reported level of dissatisfaction was low, about 6%.

Satisfaction with waiting times

Perceptions of waiting times before patients receive care were analysed, stratified by public or private sector facility. For outpatient care, 69.9% of participants thought waiting times were very good or good. The majority of those seen in the private sector had a very good experience with waiting times in outpatient facilities, meaning they received care promptly, whereas only a small percentage of public sector users had very good experiences (40.4% compared to 13.9%). Instead, those seen in public sector facilities had a good experience (47.3%). Differences in very good and good experiences between public and private facilities were significant ($p < 0.05$). It is notable that the proportion of unsatisfactory experience with waiting times was more pronounced in the public sector where a total of 24.4% thought that the experience of waiting to be served was bad or very bad. In the private sector this was a rare experience, with only 4.5% experiencing serious delay in receiving care.

Experience of being treated respectfully

Patients were more likely to have a positive health care experience if they are treated with respect by health practitioners. Overall 85.9% of outpatients thought their experience of being treated with respect was very good or good. Private sector users compared to public sector users had a greater proportion of 'very good' experiences (46.8% compared to 17.7%) with being treated respectfully by health care providers when using outpatient health facilities. About half of the public sector outpatients had a good experience with the health sector (48.7%). In total, 95.5% of private sector patients compared with 80.4% experienced respectful treatment in health care facilities, suggesting that the overall majority of patients using outpatient facilities believed they were treated with respect.

Clarity of explanations at outpatient health care facilities

Overall, 86% of both public and private outpatients had a very good or good experience of having clear explanations provided by health practitioners. Private sector users were significantly more likely than public sector users to indicate that the health care provider gave a very good explanation (47. 8% compared to 17.1%) whereas more than 60% of public sector users believed that health care providers provided good explanation compared to private providers (63% compared to 47.3%) ($p < 0.05$).

Involvement of patients in decision-making

This study assessed the extent to which health care providers involve inpatients in making decisions about the treatment to be provided. Overall, participants believed that health care providers involved them in decisions about their outpatient care as 85.2% of all inpatients indicated they had a very good or good experience being involved in decision-making. Private sector inpatients were significantly more likely than public sector outpatients to believe that health care providers were very good in involving them in decisions (57.8 compared to 25%) whereas public sector inpatients believed that health care providers were good in involving them ($p < 0.05$).

Experience of privacy

It is important to ensure patients feel comfortable when receiving care from health professionals; privacy is important both during treatment and when discussing health care options. Both inpatient and outpatient users were asked about their experiences having privacy when talking to health practitioners about their health care. For outpatient care, both public and private outpatients mostly had very good or good experiences (87.9%); however, private outpatients were much more likely to have a 'very good' experience with privacy when speaking with health care providers compared to public outpatients (45.6% compared to 17.4%), and public outpatients were more likely to have a 'good' experience compared to private outpatients ($p < 0.05$).

Choice of health care provider

Another important element of good quality care is ensuring patients are happy with their health care provider. Participants were asked about the ease with which they could see a health care provider they were happy with; overall, the majority of inpatient users (86.9%) were able to see the health care provider with whom they were happy. Private sector users were significantly more likely than public sector users to feel very good with the health care provider who served them (62.5% compared to 24.9%). The corollary is that public sector users were significantly more likely than private sector users to have good experience with the provider who served them (58.4% compared to 34.4%).

Cleanliness of facilities

Cleanliness is also an important factor in determining facility users' satisfaction with the quality of health services. The majority of both public and private outpatients found the cleanliness of facilities to be very good or good (88.6%). A larger proportion of private outpatients thought the cleanliness was very good compared to public outpatients (50.4% compared to 22%), whereas a larger proportion of public outpatients thought cleanliness was good compared to public outpatients ($p < 0.05$). A negligible proportion felt that the facilities were not clean (under 2%).

Availability of medications

Participants were asked about their perceptions of the availability of medicines at both outpatient and inpatient health care facilities. The majority of outpatients, both public and private sector users, found the availability of medicines to be very good or good (88.6%). Private outpatients were more likely than public outpatients to find medicine availability to be very good (66.2% compared to 29.1%), and the inverse was true for perceptions that medicine availability was good ($p < 0.05$). A negligible proportion of outpatients found the availability of medicines to be bad or very bad.

Availability of tests

In addition to ensuring medicines are available at health care facilities, it is also considered important that tests are available in a facility for good quality health care provision. Overall 88.7% of inpatient users were very satisfied that diagnostic tests were available. The assessment of respondents' perceptions on the availability of testing devices for inpatient care shows differing levels of satisfaction between public health sector users and private health sector users who reported satisfaction rates of 67.1% and 26.6, respectively. Less than 4% believed the tests were not available.

Social and psychological determinants of tuberculosis

The study also assessed the knowledge and awareness of TB among youth and adult South Africans, self-reported perceptions about being well informed about TB, and attitudes and stigma towards TB.

Opinions about the seriousness of TB

A majority of respondents (91.4%) across sex, age, race and province perceived TB as a very serious disease. Younger people aged 15–24 years were less likely (90.2%) to consider TB as very serious compared to older people aged 55–64 years, who perceived TB to very serious (93.5%). While people in all provinces considered TB to be a serious disease, there were fewer people in Eastern Cape (85.5%) who shared this opinion compared to those in KwaZulu-Natal (94.4%) and in Western Cape (95.2%). Across all population groups, TB is considered a serious disease. In the urban formal areas (92.6%) thought TB was very serious as compared rural informal (89.1%).

Knowledge of the signs and symptoms of TB

Responses were graded from knowing one symptom to knowing six or more symptoms. Only 3.3 % of the total number of participants identified six or more signs and symptoms of TB, 13.7% identified four or five signs and symptoms, 61.6% identified two or three signs and symptoms and 21.4 % identified only one sign and symptom. Clearly the majority of participants were only able to identify between one and three symptoms of TB.

Knowledge that TB is a curable disease

Overall more than 92% of all participants knew that TB can be cured compared with the remaining 8% who were almost evenly split between those who felt that TB could not be cured (4.2%) and those who were unsure whether TB could be cured (3.6%). This was consistent across sex, age, locality, province and race. In particular a significant number of respondents, male and female, more than 65 years of age (7.9%) did not know whether TB could be cured compared to those aged 15–24 years (2.7%).

Perceptions of comorbidity between TB and HIV

Of the total sample in this survey, only 22.3% perceived that individuals with TB are also HIV positive. The significant differences found at a 5%-level for those who responded yes to the question 'Are people with TB also HIV positive?' were as follows: there were fewer 65 years and older group (17.2%) responding 'yes' compared to those aged 35–44 years (23.5%) and those aged 55–64 years (24.3%); fewer people in Western Cape (15.8%) responded 'yes' as compared to those in Mpumalanga (27.7%); more respondents from KwaZulu-Natal (30.4%) responded 'yes' as compared to Eastern Cape (20.1%), Mpumalanga and Western Cape; and finally, more Indians (31.3%) responded 'yes' than coloureds (19.9%) and black Africans (22.9%).

HIV testing for individuals with TB: Perceptions of co-morbidity

When asked if people with TB should be tested for HIV, a large proportion of the participants (81.0%) concurred with the proposition and no difference between the two sexes was found. When disaggregated by age, the elderly were found to have significantly lower levels of understanding about the issue (69.8%) compared to all other age groups as a significantly larger proportion of them (20.7%) indicated that they did not know also when compared to all other age groups. Understanding the imperative of HIV testing among individuals with TB was found to be lowest among participants from rural informal (tribal) areas (73.1%) and was significantly lower than among participants in all the other three locality types as follows: urban formal (83.7%), urban informal (81.8%) and formal rural (farms) (84.8%).

Self-reported perception of being well informed about TB

A total of 63.2% of both males and females reported being well-informed about TB. Almost two-thirds (64.3%) of females reported being well-informed about TB, which was somewhat higher than the 62% reported by the males. Significant differences were found regarding how well-informed people are about TB: 66.4% of the respondents aged 35–44 years reported being well informed about TB, which is higher than the elderly group (65 years of age and older). Only 51.9% of people residing in rural informal areas and urban informal (58.6%) areas were less well informed than those living in urban formal settings (69.4%).

Attitudes and stigma

People with TB are often stigmatized and also experience discrimination from their communities because of being infected with the disease

Personal feelings towards people infected with TB

The majority of people (75.4%) both males and females who are over the age of 15 years, across all age and population groups in all provinces expressed empathy towards individuals with TB. Very few people reported to fear people with TB. Most males staying in the Gauteng (18.6%) reported that while they felt sorry for people with TB, they tended to stay away from them, than would males residing in the Mpumalanga (8.7%). There was little evidence of stigma towards people with TB and only 9.6% of white respondents across all age groups and provinces expressing no feelings towards people with TB.

Self-reported TB diagnosis

The prevalence of self-reported TB diagnosis was lowest among the youth aged 15–24 years (1.9%) as compared to the older age groups; urban formal areas (4.8%) reported lower life-time prevalence of TB than urban informal (8.2%) and rural informal (7.3%) areas; the prevalence of self-reported TB diagnosis was higher among coloured respondents (8.6%), than among whites (1.6%). When the data were disaggregated for sex, the only finding at a 5%-level of significance was: black Africans males (7.3%) and females (5.4%) reported lower prevalence of TB than coloured males (8.5%) and females (8.7%).

Adherence to anti-TB treatment

The percentage of participants that reported having a diagnosis of TB in their lifetime was low (5.9%). Consequently a small number of individuals reported being on treatment for TB infection, and missing their anti-TB treatment at times. When asked about completing the anti-TB treatment 91% reported that they did and 9% reported that they missed their anti-TB treatment.

RECOMMENDATIONS

As the first South African and Nutrition and Examination Survey (SANHANES-1), the results are rich with evidence that clearly shows that South Africa has indeed a huge burden of disease that is fuelled by a multiplicity of risk factors requiring multi-sectoral action and healthy public policies.

The underlying socio-economic-cultural, behavioural and environmental determinants of health are getting worse. Self-reported levels of morbidity and mortality are high and community perceptions of health services show that the public sector is generally seen as having quality of care problems even though most people are happy with the quality of inpatient services. There was general acknowledgement that whilst there are perceived differences between public and private sector, the majority of the population still uses the public sector and only those with medical aid and/or are able to pay out-of pocket largely use private services.

The specific findings of the survey will assist policymakers and programme managers identify specific target areas that need attention as part of a comprehensive approach to not only addressing the emerging diseases but all the social determinants of health including the health system. The health system needs to be reconfigured towards universal health coverage. Equitable access to quality preventative, promotive, and restorative health services is key to improving the population's health and development of the country.

On the bases of the evidence generated from the study, the SANHANES-1 Study Team made the following recommendations that require attention by all relevant stakeholders under the stewardship and leadership of the National Department of Health and/or Government:

1. Healthy public policies

In order to address the rising cost of living and reduce poverty and its effects on population health, it is critical now, more than ever to improve educational attainment and increase employment opportunities for the population. The study team strongly recommends the implementation and institutionalisation of Health in All Polices, as recently emphasised at the 8th WHO Global Conference of Health Promotion in Helsinki, Finland, 2013. This means implementation of healthy public policies within the National Development Plan – 2030 vision. This means that other sectors policies and programmes must be consistent with the protection and promotion of public health. For example, the Department of Agriculture, Fisheries and Forestry's food security policies and programmes must be sensitive to the need to not only reduce hunger and the risk of hunger but also ensure production of nutrient rich foods thereby providing wider dietary choices for populations.

2. Health status

The Department of Health should lead the country in implementing the Strategic Plan for the Prevention and Control of NCDs 2012–2016 which outlines key interventions to be implemented to achieve specified targets.

2.1 Risk Factors for NCD

a) Existing regulations on tobacco use have had some successes in reducing smoking in South Africa, but the profile of South Africans who smoke remains a large risk factor to non-communicable diseases, and the SANHANES-1 Study Team recommends that the new regulations on: (a) Reduced Ignition Propensity Cigarettes (Regulation No. 429), (b) Smoking in Public Places and Certain Outdoor Public Places (Regulation No 264) and Display of Tobacco Products at the Point of Sale (Regulation No. R634) should be implemented and their impact be monitored in the next SANHANES-1 survey.

b) The SANHANES-1 Study Team further recommends that public smoking regulations be reviewed and enforced to ensure the sale of cigarettes happens only in designated places with capacity to control under age purchases. In order to effectively reach rural communities, the anti-smoking campaign needs to be intensified via radio and cellphones given the high penetration of these forms of media in rural areas.

c) Nearly a third of men and one half of women in South Africa are unfit. To encourage physical activities, the SANHANES-1 Study Team recommends the following:
   - Introduction of worker-friendly policies that allow for physical and recreational activities;
   - Compulsory physical education training at schools;
   - Recreational parks and sports facilities part of new housing developments Ensuring provision of cycling tracks in construction of new urban roads.

d) The anthropometric measures for the South African population show that it is at high risk of being 'fat' and more so for women. The SANHANES-1 Study Team recommends a number of interventions that have been proven to work elsewhere (Hill et al. 2008, WHO 2004):
   - Regulate all forms of advertisement of unhealthy foods:
   - Community interventions through primary health care teams advising on healthy eating and exercises:
   - Ban or tax sale of junk foods at schools and nearby shops
   - Ensure that nutritionists/dietitians are engaged at primary care level.

e) Concerning household alcohol use, the study found that alcohol consumption is considered a serious problem in black African and Indian communities. Several types of interventions may reduce high-risk alcohol use. The SANHANES-1 Study Team recommends at least two of these interventions that have been shown to be most effective internationally, namely, higher alcohol sales taxes and brief interventions provided by doctors in a primary health care setting are relevant.

3. Food security

Nearly a quarter of the South African population is at risk of hunger and another quarter experienced hunger. The SANHANES-1 Study Team strongly recommends that food security in all its dimensions must be a priority for Government, requiring that all sectors play their part in improving availability and/or access to food for everyone. A special task force or team needs to be established to look at short-, medium- and long-term food security interventions for populations in different localities.

4. Nutritional status

The average South African diet is energy dense but micronutrient poor. The SANHANES-1 Study Team therefore recommends intensifying the following interventions:

- Vitamin A supplementation for children (WHO 2011).
- Iron and folic acid supplementation for pregnant women (WHO, 2012);
- Public awareness of micronutrients, dietary diversity and practices;
- The Integrated School Health Programme to ensure nutrition education and provision of micronutrient rich meals at schools should be strengthened and financed.

In addition to the above recommendations, the Department of Health should also consider medical care and special social support with intensive nutrition interventions appropriate for addressing stunting among the 0–3 year olds.

5. Mental health

The relatively high levels of psychological distress, trauma and Post Traumatic Stress Disorder (PTSD) found in the present study are a major source of concern. This situation is greatly compounded by the marginalisation of mental health in the general population as well as also within the medical field in particular. As recommended by Mensah and

Mayosi (2013), the SANHANES-1 Study Team also recommends that the government should prioritise mental health and include it as the fifth major non-communicable disease (NCD). In particular, there is a need to find ways to prevent and control mental health problems in communities. This would entail doing two things. Firstly, there is a need to address the high levels of stigma towards mental health. Secondly, and more importantly, the dire shortage of mental health professionals in the country urgently needs to be addressed.

6. Quality of health care

a) Due to lingering health inequalities that are a legacy of apartheid, the SANHANES-1 Study Team recommends that the Department of Health should implement universal health coverage plan (National Health Insurance) that will provide financial risk protection for all and end disparities in access to health services by race and gender. The national health insurance policy and plan exist and are ready for implementation.

b) The finding that most of the respondents who used inpatient and outpatient public health facilities in the previous 12 months were satisfied with the services they received is encouraging, not only to the public, but also to the health care providers who often receive very negative publicity. Based on the study results, the SANHANES-1 Study Team recommends that the government and the media should introduce a major communication campaign to support health care providers in the public sector by communicating a clear and unambiguous message that (1) most participants who used public health facilities consider health facilities to be clean, to have medicines and to have testing equipment for diagnosis, and (2) most participants perceived health care providers to treat them with respect, ensuring privacy, giving them a clear explanation of their presenting conditions and available treatment options, involving them in decision-making regarding the treatment options to encourage adherence, and are satisfied with the ease with which they could see a health care provider they were happy with.

c) The study found that the waiting times were much longer in the public health sector when compared to the private sector, suggesting that more patients are seen by few health professionals. In order to reduce NCD visits and waiting times at health facilities, the SANHANES-1 Study Team recommends the introduction of a combination of home-based care managed by community health workers and the use of point-of-care technology. This will reduce patient load at primary care facilities, reduce waiting times and also reduce the cost of health care in the long run.

7. Research and monitoring of health outcomes

South Africa is undergoing a process of epidemiological transition from infectious to non-communicable diseases (NCDs). Reliable estimates of population health parameters are therefore essential to understand the nature of the changing disease profile and translate such information into effective health promotion and disease prevention programmes. Studies such as SANHANES-1 provide the country with useful tools for monitoring the indicators to measure non-communicable diseases as outlined in the Strategic Plan for the Prevention and Control of Non-Communicable Diseases, 2012–2016 which has set the following targets:

(i) Reduce by at least 25% the relative premature mortality (under 60 years of age) from Non-communicable Diseases by 2020;
(ii) Reduce by 20% tobacco use by 2020;
(iii) Reduce by 20% the per capita consumption of alcohol by 2020;

(iv) Reduce mean population intake of salt to < 5 grams per day by 2020;
(v) Reduce by 10% the percentage of people who are obese and/or overweight by 2020;
(vi) Increase the prevalence of physical activity (defined as 150 minutes of moderate-intensity physical activity per week, or equivalent) by 10%
(vii) Reduce the prevalence of people with raised blood pressure by 20% by 2020 (through lifestyle and medication);
(viii) Every women with sexually transmitted diseases to be screened for cervical cancer every five years, otherwise every women to have three screenings in a lifetime.
(ix) Increase the percentage of people controlled for hypertension, diabetes and asthma by 30% by 2020 in sentinel sites; and
(x) Increase the number of people screened and treated for mental disorders by 30% by 2030.

The following indicators are proposed for inclusion in monitoring progress in implementing the national strategy on non-communicable diseases as well as other health outcomes:

Indicators	Measures
Life expectancy at birth	Years to live at birth
Mortality	Maternal mortality rate per 100 000 live births
	Infant (first year) mortality rate per 1 000 live births
	Perinatal (first 14 days plus still births) mortality rate per 1 000 live births
	Child (under five) mortality rate per 1000 live births
Non-communicable diseases	Diabetes prevalence (percentage random blood glucose > 7 mm/L)
	Cancer prevalence
	Hypertension prevalence (BP > 140/90)
	Deaths from myocardial infarction
	Stroke deaths
	Obesity rates (percentage BMI ≥ 30 kg/m^2)
	Glucose intolerance (fasting/random blood glucose)
	Prevalence of asthma
Mental health	Suicide rates
	Prevalence of depression, stress, and anxiety
	Psychological distress, experience of traumatic events and post-traumatic-stress disorder (PTSD)
Musculoskeletal health	Prevalence of joint pain, back pain
	Prevalence of rheumatoid arthritis
Health system performance	Public perception of health services (patient satisfaction surveys)

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Introduction

Health and nutritional status, particularly that of young children, serves as an important indicator of development, social upliftment and access to resources within communities at large. According to World Health Organization (WHO) and the Constitution of South Africa, sustained access to health care and adequate food for a healthy and active life is a human right. Despite notable achievements in the South African health care system, challenges remain to address the high disease burden, largely due to HIV/AIDS and tuberculosis (TB) and the emerging epidemic of non-communicable diseases (NCDs), the health care consequences of trauma and violence, inadequate financing, the existence of a two-tiered health care delivery system, the escalating cost of medicines and skilled human resource shortages (Shisana 2013, Mayosi, Lawn, Van Niekerk et al. 2012).

The 2010 National Department of Health's (NDoH) 'Ten Point Plan' highlights the need for key information on the general population's health profile to guide health systems planning, health service delivery including the monitoring and evaluation of programmes. Surveys that provide an epidemiological profile on the South African general population's health have been conducted in recent years. Examples of such surveys include the 1998 and 2003 South African Demographic and Health Surveys (SADHS); the Human Sciences Research Council's (HSRC) 2002, 2005 and 2008 South African National HIV Prevalence, HIV Incidence, Behaviour and Communications Surveys and the annual Department of Health National Antenatal Sentinel HIV and Syphilis Prevalence Surveys. In addition, three national surveys amoung children have been completed: The 1995 South African Vitamin A Consultative Group (SAVACG) survey; The 1999 National Food Consumption Survey (NFCS) and the 2005 National Food Consumption Survey Fortification Baseline-1 (NFCS: FB-1). The Department of Health's annual HIV and Syphilis antenatal prevalence surveys and the three HSRC national population-based HIV surveys carried out in 2002, 2005 and 2008 have enabled the monitoring of the HIV epidemic and implementation of the National Strategic Plans on HIV, STIs and TB (NDOH 2012). However, few of these national health surveys have been repeated at sufficiently regular intervals to allow trends among populations to be monitored in order to evaluate the success of interventions in the broader health domain, or capture emerging health threats.

UNAIDS/WHO estimated a national HIV prevalence of 17.3% among South Africans aged 15–49 years in 2011 based on data from the 2008 HSRC population-based HIV survey and the annual National HIV and Syphilis Antenatal Prevalence Survey. According to the 2011 estimate, this implies that around 5.6 million South Africans were living with HIV, including 460 000 children younger than 15 years of age. The 2008 HSRC survey established that a third of women 25–29 years of age were found to be HIV positive and many did not have access to alternative ways of becoming pregnant without the risk of acquiring HIV infection. The 2008 HSRC national HIV household survey data also indicated a decline in new HIV infections over the past decade in South Africa, particularly among young women 15–24 years of age. Recent 2012 data has shown that mortality has declined substantially due to an increase in the proportion of the population being treated with antiretroviral therapy. TB-HIV co-infections continue to create a major public health problem globally and in South Africa. Over 50% of TB patients are known to be HIV positive. The dual epidemic of TB and HIV creates a challenge for the delivery of health services, particularly if one examines the magnitude of the problem. In 2011, WHO estimated that the TB incidence was 993 per 100 000 population. South Africa needs to track this dual epidemic and continuously use the latest technology and most effective interventions to contain the spread of HIV and TB (NDH 2012).

As opposed to infectious diseases, NCDs, mainly cardiovascular diseases, diabetes, cancer, and chronic respiratory diseases are also a leading threat to human health and development. According to WHO in 2011, these four diseases are the world's biggest killers, causing in excess of 36 million deaths each year of which 80% are in low- and middle-income countries. These diseases are preventable. Behavioural risk factors such as an unhealthy diet, physical inactivity, tobacco use and the harmful use of alcohol are responsible for about 80% of coronary heart disease and cerebrovascular disease deaths (WHO 2013). Unless addressed with urgency, the mortality and disease burden from these health conditions will continue to increase. WHO projects that globally, between 2006 and 2015, NCD deaths will increase by 17%, and the greatest increase will be seen in the African region (27%). The first national burden of disease study for South Africa, conducted in 2000, estimated that 37% of deaths in South Africa were attributable to NCDs, many of which were associated with nutrition and lifestyle (Bradshaw, Groenewald, Laubscher et al. 2000). In 2009, the burden of NCDs in South Africa was noted to be on the rise in rural communities and was disproportionately affecting poor people living in urban settings, which resulted in higher demands for chronic care (Mayosi et al. 2009).

In terms of the nutritional status of South African women and children, the three national surveys that were conducted, collectively indicated a persisting high prevalence of under-nutrition (stunting) and micronutrient deficiencies (vitamin A, iron and zinc) as well as anaemia among almost a third of women and children, a high prevalence of overweight and obesity among women of reproductive age together with a high level of food insecurity and hunger. In order to address these nutritional disorders and as part of its Integrated Nutrition Programme, the NDoH implemented the national food fortification programme in 2003, which provided for the mandatory fortification of maize meal and wheat flour with six vitamins and two minerals in order to address micronutrient deficiencies.

South African researchers have thus been pioneers in several aspects of large scale population-based studies and have created momentum in the rest of the continent for similar ventures. The large scale of such national studies is logistically challenging but considerable experience has been developed over the years. The HSRC is the leading agency for national socio-behavioural health-related surveys with HIV-related biomarkers. In this regard, collective experience has consistently confirmed that a combination of socio-behavioural determinants with biomarkers improves the interpretation of research findings. Indeed, self-reported morbidity measures, collected by questionnaire instruments, are known to have inherent validity and reliability limitations due, largely, to recall bias. In the broader health status landscape, therefore, a combination of socio-behavioural determinants combined with a more direct clinical and biochemical assessment, such as the inclusion of disease biomarkers and physical examination, is needed to study priority diseases at the population level, and to better inform policy, such that appropriate health and nutrition interventions can be designed. This will enable the identification and tracking of risk factors for which appropriate interventions can be designed.

The South African National Health and Nutrition Examination Survey (SANHANES) was established as a continuous population health survey in order to address the changing health needs in the country and provide a broader and more comprehensive platform to study the health status of the nation on a regular basis. In this context, South Africa joins other nations that have conducted similar surveys such as the United States (the most recent 2013 National Health and Nutrition Examination Survey [NHANES]); the 2009 Canadian Health Measures Survey (CHMS) by Statistics Canada; the 2009 Health and Nutrition Survey (CHNS) by the University of North Carolina Population Centre, and the 2012 European Health Examination Survey (EHES). The first SANHANES,

SANHANES-1, provides critical information to map the emerging epidemics of NCDs in South Africa and analyses their social, economic, behavioural and political environmental determinants. Data on the magnitude of and trends in NCDs, as well as other existing or emerging health priorities, will be essential in developing national prevention and control programmes, assessing the impact of interventions, and evaluating the health status of the country. Specifically, SANHANES-1 has identified five modules that relate to the six NDOH's output priorities (Table 1.1).

Table 1.1: The SANHANES-1 modules in relation to output priorities of the Department of Health

	NDOH Output priorities addressed by SANHANES-1-1*					
The SANHANES-1 modules	1	2	3	4a	4b	5
1. NCDs and their risk factors						
a. Cardiovascular disease, hypertension, cholesterol	✗	✗	✗		✗	✗
b. Diabetes	✗	✗	✗		✗	✗
c. Smoking and tobacco use	✗	✗	✗		✗	✗
d. Diet	✗	✗	✗		✗	✗
e. Physical activity	✗	✗	✗		✗	✗
2. Selected determinants of infant mortality (infants and children under five years of age)						
a. Birth registration	✗		✗			✗
b. Early childhood development	✗		✗			
c. Breastfeeding	✗		✗			
d. Care of illness	✗		✗			
e. Diarrhoeal disease	✗		✗	✗		
b. Immunisation	✗		✗			✗
c. Road to health booklet	✗		✗			✗
3. Nutrition (adults and children)						
a. Food security	✗	✗	✗		✗	
b. Dietary intake	✗	✗	✗		✗	
c. Dietary knowledge, attitudes and behaviour	✗	✗	✗		✗	
d. Weight management and body image	✗	✗	✗		✗	
4. Tuberculosis						
a. Health-seeking behaviour	✗	✗	✗	✗		✗
b. Knowledge and awareness	✗	✗	✗	✗		✗
c. Attitudes and care-seeking behaviour	✗	✗	✗	✗		✗
d. Attitudes and stigma	✗	✗	✗	✗		✗
e. Awareness and sources of information	✗	✗	✗	✗		✗
5. Perceptions of general health and health services						
a. General health	✗	✗	✗	✗	✗	
b. Health services						✗

*NDOH output priorities
1 Increase in life expectancy
2 Decrease in maternal mortality
3 Decrease in child mortality
4a Decrease burden of disease from HIV, AIDS, TB and other communicable diseases
4b Chronic NCDs
5 Strengthened health system effectiveness

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CHAPTER 2

Methodology

2.1 Objectives

The primary objectives of SANHANES-1 were to assess defined aspects of the health and nutritional status of South Africans with respect to the prevalence of NCDs (particularly cardiovascular disease, diabetes and hypertension) and their risk factors (diet, physical activity and tobacco use):

- The knowledge, attitudes and behaviour of South Africans with respect to non-communicable and communicable infectious diseases;
- The nutritional status of South Africans as it relates to food security, dietary intake/behaviour including the consumption of alcohol, and body weight management;
- The relationship between general perceptions of health and health care services;
- The health status of children under 5 years of age;
- The health status of children 2–9 years of age with respect to physical and/or mental disabilities;
- The behavioural (smoking, diet, physical inactivity) and social determinants of health and nutrition (demographic, socio-economic status and geolocation) and relate these to the health and nutritional status of the South African population.

2.2 Study population

SANHANES-1 included individuals of all ages living in South Africa. All persons living in occupied households (HHs) were eligible to participate, but individuals staying in educational institutions, old-age homes, hospitals, homeless people, and uniformed-service barracks were not eligible to participate in the survey.

2.3 Study design

SANHANES-1 obtained questionnaire-based data through interviews in combination with health measurements obtained through clinical examination, a selection of clinical tests as well as the collection of a blood sample.

This first round of SANHANES (SANHANES-1) was a cross-sectional survey providing baseline data for future longitudinal analysis. The SANHANES-1 project also combined longitudinal as well as cross-sectional design elements. A prospective cohort approach will address the relationships between medical, nutritional and behavioural/societal risk factors assessed in the first survey phase (SANHANES-1) and subsequent morbidity, mortality and changes in risk factors at the national level.

2.4 Sampling

The survey applied a multi-stage disproportionate, stratified cluster sampling approach. A total of 1 000 census enumeration areas[1] (EAs) from the 2001 population census were selected from a database of 86 000 EAs and mapped in 2007 using aerial photography to create the 2007 HSRC master sample to use as a basis for sampling of households. The

1 An enumeration area (EA) is the spatial area that is used by Statistics South Africa (Stats SA) to collect census information on the South African population. An enumeration area consists of approximately 180 households in urban areas, and 80 to 120 households in rural areas.

selection of EAs was stratified by province and locality type. In the formal urban areas, race was also used as a third stratification variable (based on the predominant race group in the selected EA at the time of the 2001 census). The allocation of EAs to different stratification categories was disproportionate, in other words, over-sampling or over-allocation of EAs occurred in areas that were dominated by Indian, coloured or white race groups to ensure that the minimum required sample size in those smaller race groups were obtained. Based on the HSRC 2007 Master Sample, 500 Enumerator Areas (EAs) representative of the socio-demographic profile of South Africa were identified and a random sample of 20 visiting points were randomly selected from each EA, yielding an overall sample of 10 000 visiting points. EAs were sampled with probability proportional to the size of the EA using the 2001 census estimate of the number of visiting points (VPs) in the EA database as a measure of size (MOS).

One of the tasks of SANHANES-1 was to recruit and establish a cohort of 5 000 households to be followed up over the coming years. The sampling consisted of:

- a multi-stage disproportionate, stratified cluster sampling approach (Box 2.1);
- 500 EAs within which 20 VPs/households per EA were sampled;
- main reporting domains: sex (male, female), age group (< 2 years, 2–5 years, 6–14 years, 15–24 years, 25–49 years, 50 years and older), race group (black African, white, coloured, Indian), locality type (urban formal, urban informal, rural formal [including commercial farms], and rural informal), and province (Western Cape, Eastern Cape, Northern Cape, Free State, KwaZulu-Natal, North West, Gauteng, Mpumalanga, Limpopo).

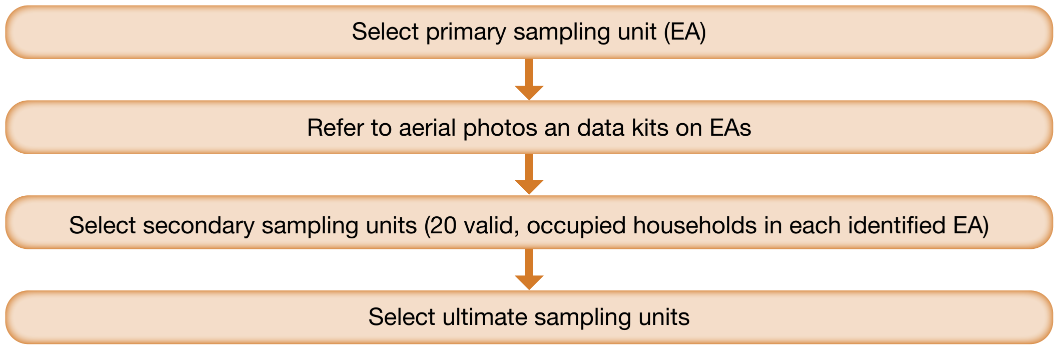
Box 2.1: Steps in sampling

1. **Define the target population:** All people in South Africa living in households
2. **Define the sampling frame:** 2001 national population census from which 500 EAs were sampled
3. **Define primary sampling units (PSUs):** 500 EAs sampled from census 2001 database of EAs
4. **Define measure of size (MOS):** Estimate of number of households per EA, MOS is used in sampling 500 EAs
5. **Allocation of sample:** Disproportional allocation of EAs to province, race group and locality type
6. **Define strata:** Province (n = 9), race (n = 4) and geographic type (n = 4)
7. **Define reporting domains:** Locality type (n = 4), age group (n = 6), sex (n = 2), race group (n = 4), province (n = 9)
8. **Define secondary sampling units (SSUs):** Occupied households, 20 sampled from each of 500 EAs
9. **Define ultimate sampling unit (USU):** All eligible individuals in the household

The 500 selected EAs formed the primary sampling units (PSUs). Visiting points (VPs) or households were used as secondary sampling units (SSUs). Within each household, eligible individuals represented the ultimate sampling unit (USUs).

In the sampled visiting point, all household members were eligible to participate in the survey (Figure 2.1). For the purposes of this survey, a household, as defined by Statistics South Africa (Stats SA) consisted of a person, or a group of persons, who occupied a common dwelling (or part of it) for at least four days a week and who provided for

Figure 2.1: Steps in drawing the sample in the field



themselves jointly with food and other essentials for living. In other words, they lived together as a unit. Persons who occupied the same dwelling, but who did not share food or other essentials, were enumerated as separate households. A 'household member' was defined as any person who slept in the household for at least four nights a week.

2.5 Sample size estimation

The sample size estimation was guided by two requirements:

- The requirement of an acceptable precision of estimates per reporting domain; that is to say to be able to estimate the prevalence of a given health or nutrition variable as well as societal risk factor(s) in each of the main reporting domains with a specified absolute precision level of less than 5%, which is equivalent to the expected width of the 95% confidence interval (z-score $Z_{1-\frac{\alpha}{2}}$ at the 95% level). A design effect of 2 was assumed to account for possible intra-class correlation.
- Requirement for measuring change over time: to detect a change of less than 10 percentage points in the prevalence of a given health or nutrition variable as well as societal risk factor in each of the main reporting domains with adequate statistical power ($Z_{1-\beta}$ = 80%, 5% level of significance [p = 0.05], two-sided test).

The total sample size of 10 000 households was based on the minimum sample sizes needed for each reporting domain, and also took into account the multistage cluster sampling design and the expected response rates. Under the assumption that 75% of the 10 000 households in the sampling frame would agree to participate, the survey would yield 7 500 valid contactable households with eligible survey participants. The average

Table 2.1: Expected sample size of eligible individuals by age group

Age groups	Total sample: 7 500 households	Longitudinal: 5 000 households
> 2 years of age	1 243	829
2–5	2 390	1 593
6 –14	5 001	3 334
15–24	5 835	3 890
25–49	9 339	6 226
50+ years	5 438	3 625
15+ years	20 612	13 741
Total	**29 247**	**19 498**

household size observed in the 2008 national HIV household survey (Shisana et al. 2009) was 3.9 persons per household and has been used for the calculation of the expected sample size of eligible individuals by age group for the total sample as well as the longitudinal component in SANHANES-1 (Table 2.1).

2.6 Measures

2.6.1 Fieldwork

Data collection was planned to be undertaken by 67 survey teams in order to meet donor expected deliverables. The survey team consisted of two subteams, the field team that administered questionnaires, and the clinic team that manned the mobile (on wheels) clinic. This design was based on the experience gained from the survey's pilot study. These teams were distributed, proportionally to size, throughout the nine provinces. The teams were coordinated by four provincial directors, who were based at the HSRC offices, or went to the field as field circumstances necessitated, and remained in constant communication with the field teams. In addition, 15 provincial coordinators were employed. In view of the large size of the population of four provinces, KwaZulu-Natal and Eastern Cape, hosted three such coordinators, while Western Cape and Gauteng hosted two and the rest of the provinces each hosted one coordinator. The rest of the field teams were comprised of a team leader, four field staff, and the clinic teams of four clinic staff, a doctor, a registered nurse, a clinic administrator and a clinic assistant who manned the (on wheels) clinic. A total of 622 staff members (Table 2.2) were required for the survey. Figure 2.2 illustrates the structure of the research team. The field work was implemented from April to August 2012 with the Northern Cape finishing in November 2012.

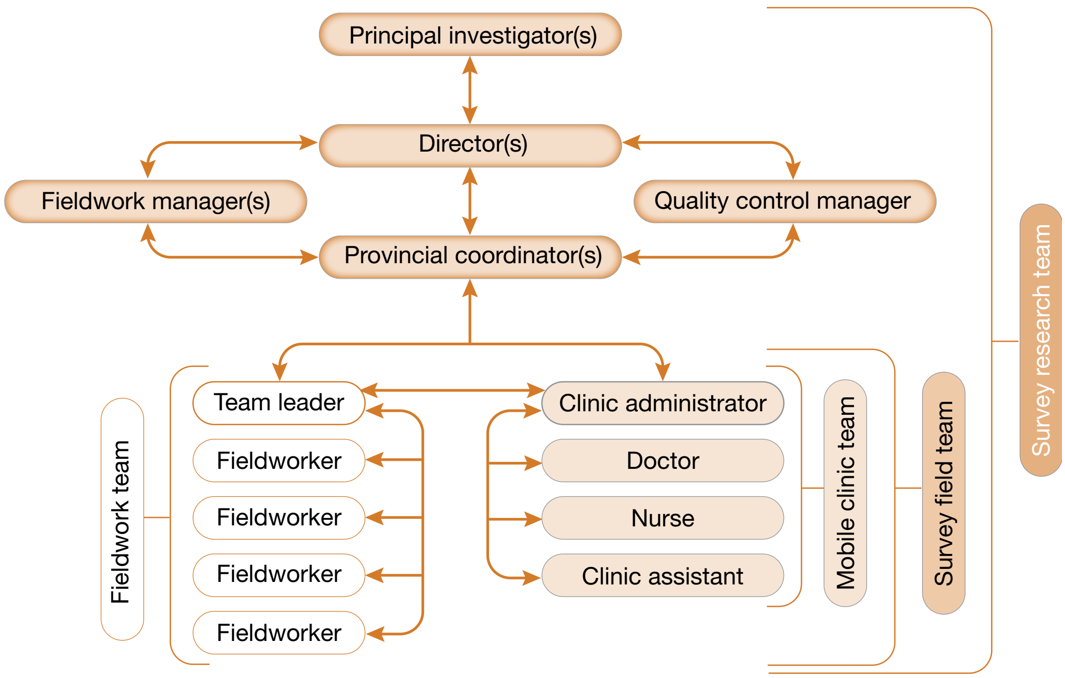
Training of the entire field force consisted of three sequential and purpose-specific sessions, one each for the training of trainers (7 days), the field team (10 days), and the clinic team (6 days; live instrumentation was used). The team leader and coordinators also attended the clinic team training session in order to achieve coherence and familiarisation of the teams. Three separate, but integrated, manuals, which covered all aspects of the field work including administrative procedures, were developed and used in the respective training sessions. Trainees who did not meet the required preset standard in the purpose-specific competence tests included in the training sessions were allowed to complete the training, but were not asked to participate in the implementation of the fieldwork.

Table 2.2: Field staff requirements

Provincial directors	One director for two or three provinces	4
Provincial coordinators	EC (three each), GP, WC (two each), FS, NW, NC, MP, LP (one each)	15
Fieldwork team	Team leader (1 × 67)	67
	Fieldworkers (4 × 67)	268
Clinic team	Doctor (1 × 67)	67
	Nurse (1 × 67)	67
	Clinic assistant (1 × 67)	67
	Clinic administrator (1 × 67)	67
Total field staff required		**622**

KZN – KwaZulu Natal, EC – Eastern Cape, GP – Gauteng, WC – Western Cape, FS – Free State, NW – North West, NC – Northern Cape, MP – Mpumalanga, LP – Limpopo

Figure 2.2: Illustration of the research team



A quality control manual was also developed and used throughout the implementation of the field work.[2]

Mobile (on wheels) clinics were a critical component in the planning of the survey. The NDoH had approved, and so informed the provincial heads of departments. The use of the mobile clinics would have enabled the clinical team to complete the clinical component of the fieldwork (physical examination, clinical tests, anthropometry and blood sampling for biomarker analysis) in the close proximity of the residence of the participants who volunteered to take part in the survey. This arrangement would have ensured that the fieldwork would have been completed within the planned framework. However, mobile clinics were not made available for a number of province-specific reasons which created the first major challenge to the survey.

In the absence of mobile clinics and the need to ensure participant safety and a good survey response rate, a number of innovative alternatives had to be considered in order to secure an environment that afforded privacy and feasibility for the clinical examination and testing of the participants. These alternatively created facilities included primary health care facilities with limited resources and space, school halls, church halls, hospice premises, city halls and community centres. Any other such premises that would create a sufficiently professional and private environment to examine and test the participants with the due respect were also used. For safety considerations, the participants had to be transported to these alternatively created facilities (using return home to 'clinic' transport).

Another improvised approach implemented, when feasible (for example, in farms and deep rural EAs or in cases where no alternative facility could be found), entailed taking

2 http://www.hsrc.ac.za/en/research-areas/Research_Areas_PHHSI/sanhanes-health-and-nutrition

the clinical team to the house of the participant(s). This alternative also proved successful and was well accepted in practically all EAs in which it was used. The comments, mentally recorded (and collected retrospectively), from members of the field force were very positive and can be summarised as 'convenient', 'pleasant experience', 'did not have to wait', and 'productive'. This approach was also associated with an additional advantage of achieving an apparently better response rate.

The adopted improvised approaches had to be implemented, if the survey was to be completed at all, as planned. This improvised approach is also the single cause of the overexpenditure both in terms of labour as well as travel and accommodation expenses arising from the delays that occurred in completing a given EA, a delay that was augmented by having to also work late in the evening and weekends; the latter was the only alternative to ensure the inclusion of participants who were employed.

The second most critical challenge encountered in conducting the fieldwork, and which compounded delays in completing the survey within the planned time framework, was the availability (and reliability) of doctors and nurses, whose other work commitments, usually emergencies, interfered with their commitment to support the clinical component of the survey.

2.6.2 Survey components

Data for this survey were collected in two separate but integrated components. These components included administering questionnaires to participants (conducting interviews) and performing a clinical examination (medical check-up by a doctor, selected measurements by a nurse/clinic assistant and collecting a blood sample for biomarker analysis) from each participant.

Questionnaire component

Fieldworkers administered the following three questionnaires during this survey:

- The VP questionnaire aimed to collect information at a household level and was completed by the head of the household. Key variables in this questionnaire included demographic data, food security, alcohol, health insurance, housing, household goods and services, accessibility to services and cost of living.
- The adult questionnaire aimed to collect information on the health and nutritional status at the individual level and was completed by all persons 15 years of age and older. Key variables in this questionnaire included biographic details, NCDs, tuberculosis, nutrition and weight management, perceptions of general health and health care utilisation.
- The child questionnaire aimed to collect information on health and nutritional status at the individual level and was completed by either parents or legal guardians of children 0–14 years of age. There were some questions, however, that the children (10–14 years of age) needed to answer themselves. Key variables in this questionnaire included biographic details of the child, parent/guardian's details, birth registration, breastfeeding, early childhood development, childhood illness and treatment, road to health/clinic card/booklet, HIV, disability, as well as diet, nutrition and weight management.

Clinical examination, clinical test and biomarkers

This section addresses clinical examinations, and blood testing of reflected biomarkers.

Table 2.3: Components of the clinical examination

Clinical examination	Target group	Person responsible
Physician's examination	Everyone	Doctor
Blood pressure and pulse rate	8 years of age and older	Doctor
Cardiovascular fitness (simple step) test	18–40 years of age	Doctor
Anthropometry		
Weight	Everyone	Clinic assistant
Height/length	Everyone	Clinic assistant
Waist circumference	three months and older	Clinic assistant
Hip circumference	three months and older	Clinic assistant
Blood sample collection	Everyone	Nurse/doctor

Clinical examination

The medical history and a full clinical examination (general and selected systems examinations):
Findings and measurements were recorded in the custom-developed clinical examination questionnaire, one each for adults and children. For the purposes of this report, Table 2.3 summarises the components of the clinical examination and indicates which clinic staff member was responsible for each component of the clinical examination. Although the responsibilities of all clinic staff were clearly delineated, the main objective in the clinic was to complete one patient as soon as possible, and team work and mutual support, as required/appropriate, among clinic members helped in achieving that aim. Participants who, in the opinion of the doctor, needed immediate medical care were referred to the nearest clinic or hospital based on need.

Clinical tests

Blood pressure and pulse rate: Blood pressure (BP) was measured using an Omron Automatic Digital BP Monitor (model M2, Omron Healthcare, Bannockburn, IL, USA). Measurements were taken after at least 5–10 minutes of rest. The correct cuff size was selected to ensure accurate measurements. An adult-standard-size cuff (16 × 30 cm) for an individual with an upper arm circumference of 27 cm to 34 cm, a 'small adult' cuff (12 × 22 cm) for an individual with an upper arm circumference of 22 cm to 26 cm, and a 'large adult' cuff (16 × 36 cm) for individuals with an arm girth of 35 cm to 44 cm. The cuff was applied to the upper non-dominant arm so that the midpoint of the length of the cuff lay over the brachial artery and the midheight of the cuff was at heart level. The lower edge of the cuff was across the natural crease of the inner aspect of the elbow. With the antecubital fossa at heart level, three pulse and BP readings were taken (NICE 2011, ESH/ESC Guidelines 2003, WHO 2003). Systolic blood pressure was recorded upon the first appearance of faint repetitive clear tapping sounds gradually increasing in intensity and lasting for at least two consecutive beats. Diastolic blood pressure was recorded at the point at which all sounds disappeared completely. The latter (phase v) correlates better with direct measurement and commonly used in clinical trials of antihypertensive therapies, and is more reproducible when assessed by different observers. There is general consensus that phase V should be taken as the diastolic pressure except when absent.

High blood pressure was defined as a systolic blood pressure (SBP) ≥ 140 mmHg and/or diastolic blood pressure (DBP) ≥ 90 mmHg (140/90 mmHg). If blood pressure measured in the clinic was 140/90 mmHg or higher, the doctor took a second measurement during

Box 2: Classification of hypertension (JNC-7) (Chobanian, Bakris, Black et al. 2003)

BP Classification	SBP mmHg	DBP mmHg
Normal	< 120	< 80
Prehypertensive	120–139	80–89
Hypertension	> 140	> 90

the consultation. If the second measurement was substantially different from the first, the doctor took a third measurement. The lower of the last two measurements was recorded as the clinic blood pressure.[3]

The following categories for blood pressure measurements were used: normal (< 120 mmHg), pre-hypertension (SBP 120–139 mmHg; DBP 80–89 mmHg) and high blood pressure or hypertension (SBP ≥ 140 mmHg; DBP ≥ 90 mmHg) (Chobanian, Bakris, Black et al. 2003).

Pulse rate: The pulse rate was counted three times for one full minute each time. The pulse rate is an indicator of overall health and fitness. The pulse rate for a healthy adult generally ranges between 60 and 100 beats per minute at rest (NICE 2011, ESH Guidelines 2003, WHO 2003).

Cardiovascular fitness (step test): In SANHANES-1 the level of physical fitness was measured in participants between 18–40 years of age using a simple submaximal exercise test called the three-minute step test. The test is based on the guidelines of the Canadian Public Health Association Project. A 30-cm-high bench (an adjustable aerobic step box) and a stopwatch (a chronograph digital stopwatch) were used. A target for age and sex pulse rate was set and not exceeded. The participant was requested to do the test by stepping on and off the bench for three minutes by stepping up the bench with one foot and then the other, then stepping down with one foot followed by the other foot. A steady four-beat cycle was maintained. This was accomplished by the doctor saying ‘up, up, down, down’ at a steady and consistent pace. At the end of three minutes, the participant remained standing while the doctor immediately checked the pulse rate. The level of fitness was determined according to the age and sex based guidelines on the three-minute step test pulse rate of the Canadian Public Health Association Project (Shephard, Thomas & Weller 1991).

Anthropometry: Weight: All participants were weighed using a bench sale (Model A1ZE, East Rand; maximum weight limit 300 kg (adult) and Seca Model 354; Medical Scales and Measuring Systems, maximum weight limit 20 kg (paediatric for children 0–24 months of age) calibrated electronic scales. The scale was placed on an even, uncarpeted area and levelled with the aid of its inbuilt spirit level (if a zero [0] appeared in the top left side of the display window, the scale was level). Participants were weighed in the clinic (young children with dry nappies only; older children with underclothes only; adolescents and adults without shoes and dressed in light clothing). The participant were requested to step on the scale or placed on the scale (children), standing still or sitting or lying (children)

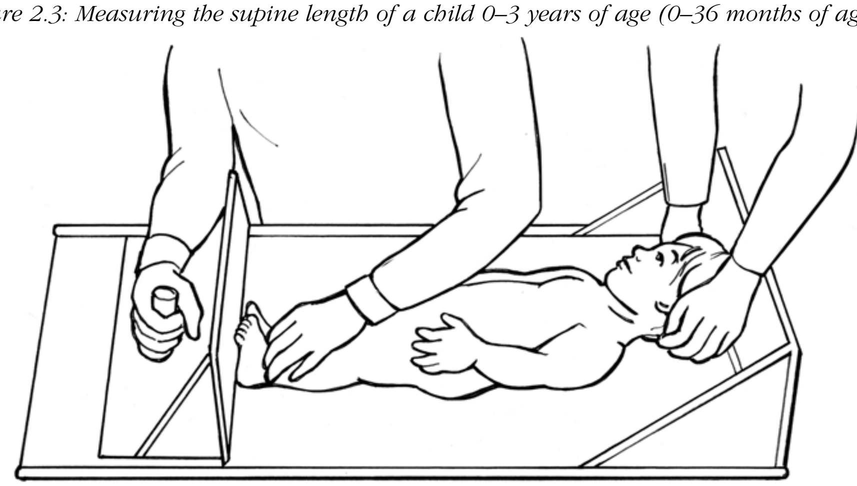
3 (http://www.hsrc.ac.za/en/research-areas/Research_Areas_PHHSI/sanhanes-health-and-nutrition)

and upright in the middle of the platform, facing the fieldworker, looking straight ahead with the feet flat and slightly apart until the reading was taken. The clinic assistant then recorded the reading in the space provided in the clinical examination form. The weight was recorded to the nearest 100 g. The participant was requested to step off the scale or removed from the scale (children). After the participant stepped down from the scale or was removed from the scale, the clinic assistant waited for the zero reading to appear on the digital display before repeating the procedure. The two readings could not vary by more than 100 g. If they did, the scale had to be checked for accuracy, and the procedure was repeated until the two readings agreed within 100 g (adults) and 10 g (children). The two measurements were recorded in the appropriate section of the clinical examination form. If the two measurements differed by more than 100 g (adults) or 10 g (children), a third measurement was taken. The two measurements that were nearest to each other were selected for further analysis.

Height/Length: Children younger than three years of age (length): For children younger than three years of age, the supine length was determined by means of a measuring board (infantometer) (Figure 2.3). The measuring board was placed on an even, uncarpeted area and care was taken to ensure that the measuring board was functional and there was no undue loose movement of the footboard. The child was placed on the measuring board lying on his/her back with the crown of the head touching the fixed headboard and the shoulders touching the base of the board. The mother/caregiver was requested to hold the child in this position, if necessary. The clinic assistant ensured that the child's heels touched the board and that the legs were straight (knees not bent), before the sliding the footboard against the soles of the child's feet. The measurement was taken on the inside of the footboard to the nearest 0.1 cm. The measurement was recorded in the space provided in the clinical examination form and the procedure was repeated. Two measurements were taken and recorded in the appropriate section of the clinical examination form. If the two measurements differed by more than 0.1 cm, a third measurement was taken. The two measurements that were nearest to each other were selected for further analysis.

For participants three years of age and older, the standing height (adults and children aged 36 months and older) was taken using a stadiometer (Seca Model 213; Medical Scales and Measuring Systems) (Figure 2.3). If a child older than 36 months was shorter than

Figure 2.3: Measuring the supine length of a child 0–3 years of age (0–36 months of age) (height)



104 cm he/she was measured by standing upright on the footboard of the infantometer. The stadiometer was placed on an even, uncarpeted area and the participant's shoes were removed. If the hair was tied up on the top of the head, it was released and the participant was positioned facing the clinic assistant and looking straight ahead with head in the Frankfurt plane (Figure 2.5). The participant's shoulders were relaxed, with shoulder blades, buttocks and heels slightly touching the stadiometer's stand, arms relaxed at sides, legs straight and knees together, and feet flat, heels touching together. The measurement was recorded in the space provided in the clinical examination form and the procedure was repeated once. Two readings were taken and the measurements were repeated. A third measurement was taken if the two readings varied by more than 0.1 cm. The two measurements closest to each other were used for further analysis.

Figure 2.4: Measuring height of participant's three years and older

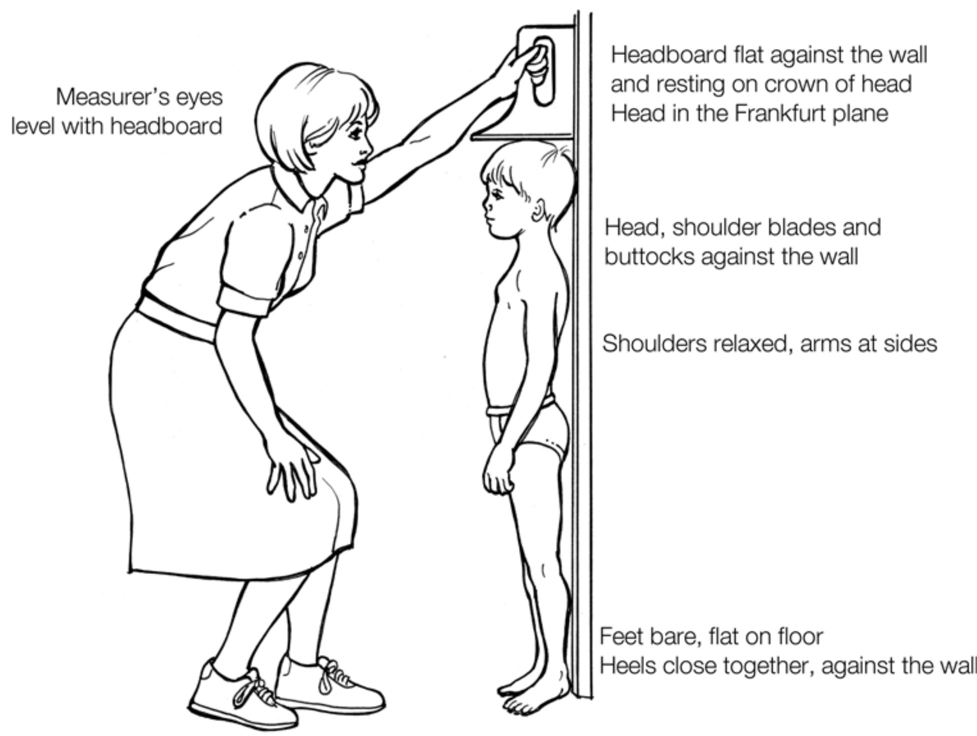
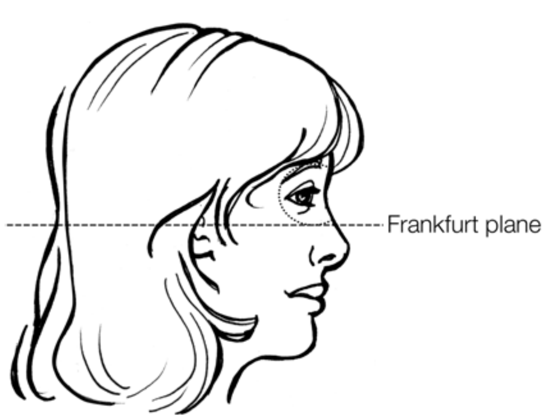


Figure 2.5: The Frankfurt plane is defined by a line from the most superior point of auditory canal to the most inferior point of infraorbital rim (eye socket/hard bony rim underneath the eye).



Body mass index

The body mass index (BMI) was calculated for all participants two years of age and older by weight (kg)/height (m)^2 and the recommended CDC/WHO cut-offs were used to ascertain underweight (BMI < 18.5), normal weight (BMI 18.5 > 25.0), overweight (BMI ≥ 25) and obesity (BMI ≥ 30). The Cole BMI cut-offs were used for the 2–17 years of age group of participants (Cole, Bellizzi, Flegal et al. 2000).

Perception of body image

Perception of body size can be defined as the accuracy of an individual's judgment of their size brought about by the way they see themselves (Cash, Grant, Shovlin et al. 1992; Dawson 1988; Madrigal, Sancez-Villegas, Martinez-Gonzalez et al. 2000). To measure perceptual body image accurately individuals can select a figure that closely resembles their body size status from a set of silhouettes – the Figure Rating Scale (FRS) ranging from the very thin to very heavy (for adults, Stunkard, Sorensen & Schulsinger et al. 1983, and for children, Stevens et al. 1999). An individual's perceived body image as selected from the body image silhouettes was compared to their actual measured body size (actual BMI) to determine how accurately an individual perceives their body image (Mciza, Goedecke, Steyn et al. 2005).

Further, individuals can select the silhouette that resembles their ideal (the one they wanted to look) from the same set of silhouettes. The feel-ideal difference (FID) index score (determined when the score of the silhouettes representing 'ideal' is subtracted to the score of the silhouette representing 'perception') is then used to determine an individual's attitude towards their own body size (Mciza, Goedecke, Steyn et al. 2005). A higher FID index score represents greater body size dissatisfaction, whereas a FID index score that approaches zero, represented less body size dissatisfaction. A FID index score that is equal to zero determines that an individual is satisfied about their body size status. A FID index score can be either negative (meaning that an individual prefers to be smaller in size) or positive (meaning that an individual prefers to be bigger in size). These desires can then motivate individuals to either want to lose or gain weight, thus different individuals will adopt different weight management strategies to reach their desired weight/body size.

Waist circumference

The participant stood erect with the abdomen relaxed, arms at the sides, feet together, and his/her weight equally divided over both legs. The lowest rib-margin and the iliac crest were identified in the mid-axillary line. The level of the waist circumference was defined as the midpoint between the two anatomical landmarks and was measured by positioning a non-stretch fibreglass tape (Seca Model 203; Medical Scales and Measuring Systems) *horizontally* round the abdomen. Participants were asked to breathe normally and to breathe out gently while the measurement was being taken so as to prevent them from contracting their muscles or holding their breath. The measurement was taken without the tape compressing the skin. The reading was taken to the nearest 0.1 cm. Two measurements were taken and recorded in the appropriate section of the clinical examination form. If the two measurements differed by more than 0.1 cm, a third measurement was taken. The two measurements that were nearest to each other were selected for further analysis (Lohman, Roche & Martorell (eds) 1988; Jones, Hunt, Brown, et al. 1986). A waist circumference > 88 cm in women and > 102 cm in men indicates central obesity.

Hip circumference

Participants stood erect and positioned as for the measurement of the waist circumference with arms at the sides and feet slightly apart. The measurement was taken at the point yielding the maximum circumference over the buttocks (Jones, Hunt, Brown et al. 1986) with the tape held in a horizontal plane, touching the skin but not indenting the soft tissue (Lohman, Roche & Martorell (eds) 1988). The measurement was taken to the nearest 0.1 cm. Two measurements were taken and recorded in the appropriate section of the clinical examination form. If the two measurements differed by more than 0.1 cm, a third measurement was taken. The two measurements that were nearest to each other were selected for further analysis.

Waist-to-hip ratio

The waist-to-hip ratio was calculated by dividing the waist circumference by the hip circumference. Values > 0.8 for women or > 1.0 for men are regarded as indicative of central obesity.

A certified anthropometrist conducted the training supported by other personnel experienced in taking anthopomentric measurements.[4]

Biomarkers South African National Accreditation System

A blood sample was drawn from the antecubital fossa by the nurse or doctor in the clinic. In adults about two to three tablespoons and in children about two to three teaspoons of blood was collected. Blood samples were collected only from consenting household members, aliquoted into the appropriate blood specimen collection tubes, mixed as necessary, kept in a cooler box containing ice packs, and were couriered daily, in a cooler box containing ice packs, to reach the appointed laboratories within 24 hours from the time a blood sample was collected for biomarker analysis (Table 2.4).

Methodology for biomarker analyses

Below is a classification of the various analytic techniques applied to blood samples.

Biomarker analysis

The appointed laboratories were Pathcare and Lancet Laboratories. Both entities are SANAS (South African National Acceditation System) accredited. Automated techniques

Table 2.4: Laboratory tests that were performed

Blood biomarkers	Target group
Cholesterol (total)	6 years of age and older
HDL	6 years of age and older
LDL	6 years of age and older
Triglycerides	6 years of age and older
HbA1c	6 years of age and older
Cotinine	10 years of age and older
Vitamin A	0–5 years of age and females 16–35 years of age
Ferritin	0–5 years of age and females 16–35 years of age

4 http://www.hsrc.ac.za/en/research-areas/Research_Areas_PHHSI/sanhanes-health-and-nutrition.
http://www.hsrc.ac.za/uploads/pageContent/620/SANHANES%20presentation%20Anthropometry.pdf

(serum lipids, ferritin [Roche Modular, Immulite 2000, BioRad D10, Abbott Architect]) including HPLC (HbA1c, vitamin A, cotinine), were used for the biomarker analyses. Deviations from the established internal and external quality control procedures, by agreement, had to be reported, and none were reported. Analytical quality control documentation indicated that the coefficient of variation for the analyses ranged from 0.5–3.75%.

The following concentrations were used as cut-offs for normality:

Serum total cholesterol:	≤ 5.0 mmol/L
LDL-cholesterol:	≤ 3.0 mmol/L
HDL-cholesterol:	≥ 1.0 mmol/L
Triglycerides:	≤ 1.7 mmol/L
HbA1c:	≥ 6.5% for diagnosing diabetes ≥ 6.1 ≤ 6.5 for impaired glucose homeostasis
Cotinine:	≤ 10 ng/ml for no active smoking
Vitamin A:	Vitamin A deficient (VAD): serum retinol concentration < 0.70 µmol/L. Vitamin A sufficient: serum retinol concentration ≥ 0.70 µmol/L.

The following prevalence cut-offs for low serum retinol (< 0.70 µmol/L) to define VAD in populations and its level of public health significance, were applied (WHO 2011):

Mild public health problem:	Prevalence of low serum retinol (<0.70 µmol/L) of 2–9%
Moderate public health problem:	Prevalence of low serum retinol (<0.70 µmol/L) of 10–19%
Severe public health problem:	Prevalence of low serum retinol (<0.70 µmol/L) of 20% or more

Anaemia: The prevalence of anaemia (Haemoglobin < 11 g/dL) as a problem of public health significance can be classified as follows (WHO/CDC 2008):

No public health problem:	Prevalence of haemoglobin (<11 g/dL) of ≤ 4.9%,
Mild public health problem:	Prevalence of haemoglobin (<11 g/dL) of 5–19.9%
Moderate public health problem:	Prevalence of haemoglobin (<11 g/dL) of 20–39.9%
Severe public health problem:	Prevalence of haemoglobin (<11 g/dL) of 40% or more

The following are the recommended Hb cut-offs for defining anaemia prevalence in children under five years of age (WHO 2011a):

Mild anaemia:	haemoglobin 10.9–10.0 g/dL
Moderate anaemia:	haemoglobin 9.9–7.0 g/dL
Severe anaemia	haemoglobin < 7 g/dL

Iron status: Serum ferritin measurements were performed and the following cut-offs were applied for the diagnosis of iron status (WHO 2011b):

Iron deficiency:	Ferritin < 12 ng/mL
Iron depletion:	Ferritin < 12 ng/mL and Hb ≥ 11 g/dL
Iron deficiency anaemia:	Ferritin < 12 ng/mL and Hb < 11 g/dL

2.7 Ethics approval

The study received approval from the Research Ethics Committee (REC) of the HSRC (REC 6/16/11/11).

2.8 Data management, weighting and analysis

Several steps were taken to prepare data for analysis. These steps are presented in this section.

2.8.1 Data management

Databases reflecting each questionnaire type were designed. These databases were for the VP questionnaire, the child questionnaire and the youth/adult questionnaire. All databases were developed incorporating range restrictions using the Census and Survey Processing System (CSPro). Data were double-entered and verified from the original questionnaires through CSPro. Captured data were converted to Statistical Package for Social Scientist (SPSS) for descriptive analyses and exploration of data quality. Verified and cleaned data were further converted to Stata and Statistical Analyses Systems (SAS) for further detailed exploratory analyses, cross-tabulations, weighting and analyses.

Weighting

Due to the multistage cluster sampling design of SANHANES-1, some individuals had a greater or lesser probability of selection than others. This unequal sampling may result in the bias of estimates. To correct this potential bias, sample weights were introduced to correct for bias at the EA, household, and individual levels, and also adjusted for non-response.

In drawing the 500 EAs, EA sampling weights were computed. These EA sampling weights were calculated to account for unequal measures of size during the sampling. However, not all 500 EAs were realised. Therefore, these EAs sampling weights were adjusted for non-response at EA level. Furthermore, not all targeted VPs were realised thus VP sampling weights were computed based on the realised and valid households. Demographic, physical examination and clinical examination information – on all persons in all households in all responding EAs – was then assembled in order to calculate individual sample weights at each responding level (questionnaire, physical and clinical examination). In each of the five-years of age groups, the individual weight was the total number of individuals in that age group in each valid VP or household. These individual sample weights were also adjusted for physical examination non-response and clinical examination non-response. This weight was equal to the final VP sampling weights multiplied by the selected person’s sampling weight per VP per age group. This process produces a final sample representative of the population in South Africa for sex, age, race, locality type and province. The survey was designed to be generalisable to the entire population of South Africans living in households. Sampling weights were thus benchmarked to the 2012 midyear population estimates (Stats SA 2013).

The weighting process described was conducted using SAS version 9.3 in conjunction with CALMAR macro for benchmarking.

2.8.2 Data analysis

Descriptive statistical analyses were conducted. Both Stata and SPSS software commands were used to obtain the estimates of prevalence or proportions of responses and cross-tabulations. Weighted analysis (benchmarked to the 2012 midyear population estimates provided by Stats SA for age, race group, and province) was conducted to ensure that the estimates of the health and nutritional variables were representative of the general population. Analyses of weighted data were conducted using STATA 11 software taking into account the complex multi-level sampling design and adjusting for non-response.

To verify results, data analysis was carried out independently by at least two biostatisticians. Tables and figures in the results section of the report present weighted percentages and unweighted counts.

Criteria used for the assessment of anthropometric status in children

The data were compared with the WHO AnthroPlus software for the global application of the WHO Reference 2007 for 5–19 years of age. The WHO Child Growth Standard for 0–5 years of age were also included in the AnthroPlus software.[5] For each child, a z-score (the number of standard deviations [SDs] from the reference population median) was calculated for BMI-age (BAZ), weight-for-age (W/A) and height-for-age (H/A). If the z-score for weight-for-age was less than –6 SDs or greater than +5 SDs; or height-for-age was less than –6 SDs or greater than +6 SDs, or if the z-score for BMI-for-age was less than –5 SDs or greater than +5 SDs, then the record was verified against the questionnaire and for accuracy of data entry. Where an error had occurred on data entry, this was corrected; where no error could be detected, the indicator with such an extreme z-score was set to missing and, therefore, excluded from the analysis. For women, heights below 120 cm with BMI greater than 60 were excluded and BMIs < 10 or > 70 were excluded.

5 http://www.who.int/growthref and http://www.who.int/childgrowth

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CHAPTER 3

Results

3.1 Response analysis

Every effort was made to ensure that the survey achieved a high response rate. The strategies used included: (a) notifying communities prior to the survey that a survey will be conducted and giving adequate explanation of the study to potential respondents, (b) making a maximum of four revisits to each sampled household, if necessary, for the purpose of finding a respondent in the household, (c) informing the respondents that the data will be anonymised, (d) ensuring privacy when conducting the interviews and the clinical examination, (e) working early in the morning and/or late in the evenings in order to accommodate participants' commitments, and (f) extending the duration of completion of a given EA, almost always due to doctor/nurse unavailability as well as the unavailability of mobile (on wheels) clinic. All such measures were taken with cost considerations in mind.

3.1.1 Household response rate

This section deals with the different response rates of the survey. During the fieldwork, a proportion of the selected VPs turned out to be invalid. For instance, if the dwelling on the VP has been destroyed or vacated, or the building at the VP was a business enterprise, such a VP was not included in the response analysis at the household level. This is not considered to be a non-response. Furthermore, during the survey, a number of other factors also contributed to a loss of realised VPs. For instance, some VPs were vacant or could not be reached.

Table 3.1.1 shows that of 10 000 households (VPs) sampled, 8 168 were valid, occupied households and 1 832 VPs were invalid or clearly abandoned VPs/ households. In addition, 573 VPs were not realised for either being empty after repeated visits or other reasons. Of the 8 168 valid VPs/ households, 6 306 (77.2%) were interviewed whilst 22.8% were non-response. Proportions of non-response at household level were as follows:

- 1 289 (15.8%) refused to take part in the survey;
- 573 (7.0%) were valid households but empty after repeated visits or the none-response involved other reasons.

Table 3.1.1: Household/VP response rates, South Africa 2012

Variable	Total VPs	Valid VPs		Interviewed		Refused		Absent/other	
	n	n	%	n	%	n	%	n	%
Household/VP	**10 000**	**8 168**	**81.7**	**6 306**	**77.2**	**1 289**	**15.8**	**573**	**7.0**
Race									
African	4 795	4 242	88.5	3 743	88.2	283	6.7	216	5.1
Coloured	1 759	1 500	85.3	1 180	78.7	222	14.8	98	6.5
Asian/Indian	1 262	1 131	89.6	790	69.8	265	23.4	76	6.7
Whites	1 598	1 282	80.2	582	45.4	518	40.4	182	14.2
Other/unknown	586	15	2.6	11	73.3	3	20.0	1	6.7
Total	10 000	8 168	81.7	6 306	77.2	1 289	15.8	573	7.0

Locality									
Urban formal	5 779	8 145	140.9	6 574	80.7	1 131	13.9	440	5.4
Urban Informal	942	1 264	134.2	1 170	92.6	48	3.8	46	3.6
Rural informal	1 796	2 267	126.2	2 095	92.4	76	3.4	96	4.2
Rural formal	908	1 190	131.1	1 090	91.6	65	5.5	35	2.9
Other/unknown	575	11	1.9	0	0.0	3	27.3	1	9.1
Total	10 000	12 866	128.7	10 929	84.9	1 320	10.3	617	4.8
Province									
Western Cape	1 304	1 113	85.4	828	74.4	184	16.5	101	9.1
Eastern Cape	1 275	1 041	81.6	814	78.2	169	16.2	58	5.6
Northern Cape	684	527	77.0	410	77.8	83	15.7	34	6.5
Free State	613	541	88.3	436	80.6	76	14.0	29	5.4
KwaZulu-Natal	1 828	1 590	87.0	1 229	77.3	300	18.9	61	3.8
North West	715	674	94.3	606	89.9	48	7.1	20	3.0
Gauteng	1 515	1 368	90.3	910	66.5	283	20.7	175	12.8
Mpumalanga	635	604	95.1	563	93.2	26	4.3	15	2.5
Limpopo	867	710	81.9	510	71.8	120	16.9	80	11.3
Other/unknown	564	0	0.0	0		0		0	
Total	10 000	12 866	128.7	10 929	84.9	1 320	10.3	617	4.8

3.1.2 Individual interview response rate

In the 8 168 valid VPs/households that agreed to participate in the survey, 27 580 individuals were eligible to be interviewed.

A total of 25 532 individuals (92.6%) completed the interview whilst 7.4% refused to participate. Females were slightly more likely to participate than males (Table 3.1.2). Generally, all races were equally likely to participate in the survey.

Table 3.1.2: Individual questionnaire response rate, South Africa 2012

	Questionnaire interview response rate				
	Total	Interviewed		Refused	
	n	n	%	n	%
Overall	**27 580**	**25 532**	**92.6**	**2 048**	**7.4**
Age categories					
0–14	9 077	8 629	95.1	448	4.9
15–24	5 083	4 712	92.7	371	7.3
25–34	3 699	3 363	90.9	336	9.1
35–44	2 957	2 736	92.5	221	7.5
45–54	2 719	2 504	92.1	215	7.9
55–64	2 058	1 910	92.8	148	7.2
65+	1 685	1 555	92.3	130	7.7
15–49	13 130	12 095	92.1	1 035	7.9
Total	27 278	25 409	93.1	1 869	6.9

Sex					
Males	12 271	11 273	91.9	99 800	8.1
Females	14 789	13 885	93.9	90 400	6.1
Total	**27 060**	**25 158**	**93**	**190 200**	**7**
Race					
African	18 368	17 143	93.3	1 225	6.7
White	1 117	1 014	90.8	103	9.2
Coloured	5 308	4 918	92.7	390	7.3
Asian/Indian	2 043	1 879	92	164	8
Other	84	80	95.2	4	4.8
Total	26 920	25 034	93	1 886	7
Locality					
Urban formal	14 223	13 031	91.6	1 192	8.4
Urban informal	3 648	3 393	93	255	7
Rural informal	6 346	5 912	93.2	434	6.8
Rural formal	3 363	3 196	95	167	5
Total	27 580	25 532	92.6	2 048	7.4
Province					
Western Cape	3 776	3 431	90.9	345	9.1
Eastern Cape	3 197	2 981	93.2	216	6.8
Northern Cape	1 698	1 565	92.2	133	7.8
Free State	1 668	1 542	92.4	126	7.6
KwaZulu-Natal	4 741	4 285	90.4	456	9.6
North West	3 338	3 127	93.7	211	6.3
Gauteng	4 619	4 277	92.6	342	7.4
Mpumalanga	2 384	2 262	94.9	122	5.1
Limpopo	2 159	2 062	95.5	97	4.5
Total	27 580	25 532	92.6	2 048	7.4

3.1.3 Physical and clinical examination response rate

The 25 532 individuals who agreed to be interviewed were further invited to participate in the physical and clinical examination conducted in the clinic. Table 3.1.3 presents response rates for physical and clinical examinations. Of those that were eligible, 43.6% and 29.3% consented to physical examination and blood testing respectively (Table 3.1.3).

Table 3.1.3: Interview, physical examination and specimen response coverage by demographic characteristics, South Africa 2012

	Response profiles						
	Interviewed		Physical examination		Specimen collected		Total eligible
	n	%	n	%	n	%	
Overall	**25 532**	**92.6**	**12 025**	**43.6**	**8 078**	**29.3**	**27 580**
Age categories							
0–14	8 629	95.1	4 583	50.5	2 642	29.1	9 077
15–24	4 712	92.7	2 032	40	1 508	29.7	5 083
25–34	3 363	90.9	1 249	33.8	907	24.5	3 699
35–44	2 736	92.5	1 130	38.2	806	27.3	2 957
45–54	2 504	92.1	1 167	42.9	856	31.5	2 719
55–64	1 910	92.8	978	47.5	713	34.6	2 058
65+	1 555	92.3	880	52.2	642	38.1	1 685
15–49	12 095	92.1	5 006	38.1	3 655	27.8	13 130
Total	25 409	93.1	12 019	44.1	8 074	29.6	27 278
Sex							
Males	11 273	91.9	4 917	40.1	3 270	26.6	12 271
Females	13 885	93.9	7 095	48	4 801	32.5	14 789
Total	25 158	93.0	12 012	44.4	8 071	29.8	27 060
Race							
African	17 143	93.3	8 745	47.6	5 676	30.9	18 368
White	1 014	90.8	167	15	120	10.7	1 117
Coloured	4 918	92.7	2 482	46.8	1 887	35.6	5 308
Asian/Indian	1 879	92	446	21.8	272	13.3	2 043
Other	80	95.2	39	46.4	17	20.2	84
Total	25 034	93	11 879	44.1	7 972	29.6	26 920
Locality							
Urban formal	13 031	91.6	5 296	37.2	3 571	25.1	14 223
Urban informal	3 393	93	1 634	44.8	1 014	27.8	3 648
Rural informal	5 912	93.2	3 188	50.2	2 058	32.4	6 346
Rural formal	3 196	95	1 907	56.7	1 435	42.7	3 363
Total	25 532	92.6	12 025	43.6	8 078	29.3	27 580
Province							
Western Cape	3 431	90.9	1 829	48.4	1 420	37.6	3 776
Eastern Cape	2 981	93.2	1 644	51.4	1 328	41.5	3 197
Northern Cape	1 565	92.2	722	42.5	550	32.4	1 698
Free State	1 542	92.4	1 006	60.3	657	39.4	1 668
KwaZulu-Natal	4 285	90.4	1 754	37	1 004	21.2	4 741
North West	3 127	93.7	1 410	42.2	1 006	30.1	3 338
Gauteng	4 277	92.6	1 292	28	754	16.3	4 619
Mpumalanga	2 262	94.9	1 387	58.2	823	34.5	2 384
Limpopo	2 062	95.5	981	45.4	536	24.8	2 159
Total	25 532	92.6	12 025	43.6	8 078	29.3	27 580

3.1.4 Comparison of the survey sample with the 2012 midyear estimates

To assess the generalisability of the survey results, it is critical to compare the socio-demographic profile of the study population with the 2012 South African midyear population estimates provided by Stats SA.

Table 3.1.4 compares the demographic characteristics of the weighted survey sample with the 2012 midyear population estimates. The weighted sample compares generally well with the 2012 midyear estimates.

Table 3.1.4: Demographic characteristics of the survey sample compared to the 2012 midyear population

Demographics	Weighted sample		Midyear population 2012	
	n	%	n	%
Age				
0–14	15 460 322	29.6	15 459 959	29.6
15–24	10 130 722	19.4	10 130 660	19.4
25–34	9 009 761	17.2	9 009 713	17.2
35–44	7 041 054	13.5	7 041 024	13.5
45–54	4 840 748	9.3	4 840 720	9.3
55–64	3 153 832	6.0	3 153 804	6.0
65+	2 639 079	5.0	2 639 066	5.0
Total	52 275 518	100.0	52 274 945	100.0
Sex				
Male	25 453 240	48.7	25 453 074	48.7
Female	26 822 013	51.3	26 821 871	51.3
Total	52 275 253	100.0	52 274 945	100.0
Province				
Western Cape	5 344 591.6	10.2	5 904 017	11.3
Eastern Cape	6 147 335.5	11.8	6 586 307	12.6
Northern Cape	851 584.8	1.6	1 153 090	2.2
Free State	2 738 948.1	5.2	2 748 506	5.3
KwaZulu-Natal	8 910 241.7	17.0	10 345 539	19.8
North West	4 578 572.4	8.8	3 546 631	6.8
Gauteng	15 943 232	30.5	12 463 886	23.8
Mpumalanga	2 877 869.1	5.5	4 074 763	7.8
Limpopo	4 883 266.7	9.3	5 452 206	10.4
Total	52 275 642	100.0	52 274 945	100.0
Race				
African	41 624 748	79.6	41 624 670	79.6
White	4 622 376	8.8	4 622 373	8.8
Coloured	4 716 488	9.0	4 716 471	9.0
Asian/Indian	1 311 441	2.5	1 311 431	2.5
Total	52 275 053	100.0	52 274 945	100.0

3.2 Socio-economic demographics

The demographics collected is an essential component of any survey and it provides information on the background of the population studied for readers, and policymakers alike, against which the findings are interpreted. Demographics set the scene of the entire survey as most variables are analysed in relation to the specific demographic characteristics of a population. In this survey, the demographic characteristics that are described include age, sex, race, locality, province, education, income and sources of income as well as participants' perception of the cost of living. Other demographic information, collected but not presented in this report, include household composition, nationality, employment, marital status, migration, health insurance, housing and household goods and services. This information will be presented in the HSRC's national Health and Demographic report 2013.

Results

3.2.1 Education

Demographic characteristics of the sampled population are stratified by age, sex, race, locality type, and province. In a sample of 19 319 individuals, 6% had no schooling, 34% completed a primary school level of education, 33% completed high school, 20% completed matric, while 8% completed a tertiary level of education (Table 3.2.1). Older participants, those 55 to 64 years of age (17%) and 65 years of age and older (38%) tended to have had no schooling or had attended primary school (40% and 32% respectively), and a lower percentage had reached the matric education level (9% and 6% respectively). By contrast, higher percentage of younger participants 15 to 24 years of age and 25 to 34 years of age had reached high school (56% and 35% respectively), matric (27% and 40% respectively) and tertiary education level (6% and 13% respectively).

There was no sex difference in the educational characteristics of participants particularly in terms of high school and tertiary education. Provincially, in Gauteng, more people had attained matric and tertiary level education (27% and 12% respectively). North West, Limpopo and Mpumalamga had the highest percentage of participants with no schooling (15%, 12% and 10% respectively). Eastern Cape, North West and Limpopo had the lowest number of people who had attained matric (14%, 16% and 16% respectively). With regards to people who had attained a tertiary level education, North West had the lowest numbers of people who had achieved tertiary education (3%). Indians followed by whites had the highest number of participants who completed matric education (34% and 24% respectively) and more whites (38%) had completed tertiary education followed by Indians (13%).

3.2.2 Perception of cost of living

With regard to participants' perception of household cost of living by locality, 39% of 5 972 households indicated that their households did not have enough money for basic things, such as food and clothes, while 18% indicated that they had most of the important things, but few luxury goods (Table 3.2.2). Most of the households from the urban informal (58%) and rural informal (51%) reported that they did not have enough money for basic things such as food and clothes while the smallest number was from the urban formal areas (29%). Most of the households that did not have enough money for basic things, such as food and clothes, were from North West (58%), while the least were from the Gauteng province (29%). More black African participants (44%) reported that they did not have enough money for basic things, like food and clothes, followed by coloureds (28%) and Indians (12%), while only 6% whites indicated so.

Table 3.2.1: Educational attainment of the sample by age, sex, locality, province and race, South Africa 2012

Background characteristics	No schooling		Primary school		High school		Matric		Tertiary		Total*
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age											
7–14	1.0	[0.5–2.2]	87.2	[85.6–88.6]	11.5	[10.1–13.0]	0.2	[0.1–0.6]	0.1	[0.0–0.4]	4 001
15–24	1.3	[0.8–1.9]	9.4	[8.0–11.1]	55.7	[53.0–58.4]	27.3	[24.7–30.1]	6.3	[4.9–8.0]	4 529
25–34	3.0	[1.9–4.7]	8.3	[6.8–10.1]	35.3	[32.1–38.7]	40.3	[37.0–43.7]	13.2	[10.5–16.3]	3 152
35–44	5.9	[4.1–8.4]	16.7	[14.2–19.5]	31.5	[28.2–34.9]	31.8	[28.4–35.4]	14.1	[11.2–17.6]	2 478
45–54	9.0	[7.1–11.5]	27.4	[23.5–31.6]	32.8	[28.8–37.1]	18.2	[15.1–21.9]	12.5	[9.5–16.4]	2 208
55–64	16.8	[13.7–20.4]	39.8	[35.5–44.2]	27.3	[23.6–31.5]	9.4	[7.3–11.9]	6.7	[4.9–9.2]	1 642
65 +	38.2	[32.6–44.2]	31.9	[26.7–37.5]	17.9	[14.1–22.4]	5.7	[3.6–9.0]	6.2	[4.1–9.4]	1 309
Total	6.0	[5.1–7.0]	33.6	[32.0–35.3]	32.8	[31.5–34.1]	20.2	[18.6–21.8]	7.5	[6.4–8.8]	19 319
Sex											
Male	4.7	[3.9–5.6]	35.9	[33.9–37.9]	33.4	[31.8–35.0]	18.5	[16.7–20.3]	7.6	[6.3–9.2]	8 599
Female	7.1	[6.0–8.3]	31.7	[30.0–33.4]	32.3	[30.7–34.0]	21.6	[19.8–23.4]	7.4	[6.2–8.8]	10 634
Total	6.0	[5.1–7.0]	33.5	[31.9–35.2]	32.8	[31.5–34.2]	20.2	[18.6–21.8]	7.5	[6.4–8.8]	19 233
Locality											
Urban formal	2.9	[2.0–4.3]	28.2	[26.4–30.0]	32.4	[30.3–34.7]	25	[22.9–27.1]	11.5	[9.4–13.9]	10 357
Urban informal	5.4	[3.2–8.9]	38.8	[35.5–42.2]	38.9	[35.3–42.6]	15.4	[12.3–19.1]	1.5	[1.0–2.3]	2 413
Rural informal	10.4	[8.9–12.2]	37.3	[34.2–40.5]	31.6	[30.0–33.3]	16.4	[14.3–18.9]	4.2	[3.4–5.2]	4 217
Rural formal	10.1	[8.2–12.5]	48.5	[45.1–51.9]	31.9	[29.3–34.6]	8.3	[6.1–11.1]	1.2	[0.7–2.1]	2 332
Total	6.0	[5.1–7.0]	33.6	[32.0–35.3]	32.8	[31.5–34.1]	20.2	[18.6–21.8]	7.5	[6.4–8.8]	19 319
Province											
Western Cape	1.7	[1.1–2.8]	33.9	[30.6–37.3]	39.3	[36.8–41.9]	19.2	[16.8–21.8]	5.9	[3.8–9.0]	2 692
Eastern Cape	5.4	[4.4–6.7]	44.6	[38.7–50.8]	31.2	[28.6–33.9]	13.8	[10.2–18.4]	4.9	[3.4–6.9]	2 224
Northern Cape	7.6	[4.7–12.1]	37.3	[31.6–43.4]	30.4	[26.1–35.0]	20.0	[13.6–28.5]	4.7	[2.7–8.1]	1 294
Free State	4.6	[2.7–7.7]	37.4	[32.5–42.7]	34.5	[30.8–38.5]	17.5	[14.0–21.5]	6.0	[3.2–10.9]	1 156
KwaZulu-Natal	7.0	[5.2–9.4]	34.8	[31.6–38.1]	33.0	[30.4–35.8]	18.9	[16.0–22.1]	6.3	[4.1–9.6]	3 562
North West	14.9	[11.2–19.7]	35.6	[31.0–40.4]	30.9	[28.0–34.1]	15.9	[12.7–19.9]	2.6	[1.6–4.2]	2 008
Gauteng	2.4	[1.2–4.8]	28.1	[25.3–31.1]	30.8	[27.4–34.3]	26.8	[23.5–30.4]	12.0	[9.0–15.7]	3 241
Mpumalanga	10.0	[7.9–12.7]	35.8	[31.8–40.1]	31.8	[28.2–35.6]	17.9	[14.5–21.9]	4.5	[2.8–7.1]	1 666
Limpopo	11.9	[9.1–15.4]	28.7	[25.6–31.9]	36.2	[32.5–40.0]	15.9	[13.1–19.1]	7.4	[5.5–9.8]	1 476
Total	6.0	[5.1–7.0]	33.6	[32.0–35.3]	32.8	[31.5–34.1]	20.2	[18.6–21.8]	7.5	[6.4–8.8]	19 319
Race											
African	6.7	[5.7–7.9]	34.1	[32.2–36.0]	32.8	[31.3–34.3]	19.9	[18.1–21.8]	6.4	[5.2–7.9]	12 778
White	0.1	[0.0–0.2]	21.7	[15.5–29.4]	16.0	[12.1–20.8]	23.9	[17.9–31.2]	38.3	[32.5–44.5]	826
Coloured	2.4	[1.7–3.4]	34.6	[31.3–38.1]	39.0	[36.5–41.5]	18.1	[15.7–20.9]	5.9	[4.3–7.9]	3 942
Asian/Indian	3.1	[1.6–5.7]	20.3	[18.0–22.7]	30.2	[26.2–34.5]	33.5	[29.5–37.8]	13.0	[7.3–21.9]	1 632
Total	6.0	[5.2–7.0]	33.5	[31.9–35.2]	32.8	[31.5–34.2]	20.1	[18.6–21.8]	7.5	[6.4–8.8]	19 178

** The totals vary as some individuals did not provide all their demographic information.*

95% CI: 95% confidence interval

Table 3.2.2: Participants' perception of cost of living by locality, province and race, South Africa 2012

Background characteristics	Not enough money for basic things such as food and clothes		Money for food and clothes, but short on many other things		We have most of the important things, but few luxury goods		Money for extra things such as holidays and luxury goods		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Locality									
Urban formal	28.9	[25.3–32.7]	37.4	[34.1–40.7]	26.3	[22.8–30.0]	7.5	[5.5–10.2]	3 334
Urban informal	57.8	[50.8–64.6]	32.5	[27.4–38.1]	8	[5.8–10.9]	1.7	[0.8–3.3]	731
Rural informal	51.2	[46.9–55.5]	39.1	[35.0–43.3]	7.6	[5.9–9.8]	2.1	[1.0–4.2]	1 290
Rural formal	44.9	[36.9–53.3]	40.0	[34.1–46.3]	10.2	[5.9–17.2]	4.8	[3.1–7.3]	617
Total	39.0	[36.3–41.7]	37.6	[35.3–39.9]	18.2	[16.1–20.6]	5.2	[4.0–6.8]	5 972
Province									
Western Cape	31.1	[24.4–38.7]	32.4	[26.6–38.9]	27.7	[21.6–34.8]	8.7	[5.1–14.6]	802
Eastern Cape	51.7	[44.5–58.8]	30.0	[24.4–36.3]	14.8	[10.4–20.8]	3.5	[1.4–8.5]	773
Northern Cape	31.8	[20.3–46.0]	38.1	[29.0–48.2]	21.6	[15.9–28.6]	8.5	[5.1–13.8]	389
Free State	48.0	[40.0–56.1]	42.7	[37.2–48.4]	8.0	[3.7–16.5]	1.3	[0.6–3.0]	409
KwaZulu-Natal	36.2	[30.2–42.7]	39.9	[34.4–45.6]	16.7	[12.5–22.0]	7.2	[4.1–12.2]	1 177
North West	58.0	[50.8–64.9]	28.9	[23.3–35.2]	12.0	[8.8–16.3]	1.0	[0.5–2.4]	554
Gauteng	28.8	[23.1–35.2]	40.1	[35.1–45.3]	23.8	[18.3–30.3]	7.3	[4.4–11.8]	865
Mpumalanga	40.4	[31.5–50.0]	42.9	[33.0–53.4]	14.4	[8.4–23.4]	2.3	[1.2–4.4]	523
Limpopo	43.7	[35.9–51.7]	43.1	[36.9–49.6]	12.5	[8.6–17.6]	0.8	[0.3–2.1]	480
Total	39.0	[36.3–41.7]	37.6	[35.3–39.9]	18.2	[16.1–20.6]	5.2	[4.0–6.8]	5 972
Race of head of household									
African	44.0	[41.0–47.1]	39.2	[36.7–41.6]	14.2	[12.0–16.7]	2.6	[1.8–3.7]	3 901
White	5.6	[3.5–9.0]	19.5	[12.7–28.8]	39.8	[31.3–49.0]	35.1	[26.0–45.4]	354
Coloured	28.2	[23.7–33.1]	37.6	[33.0–42.5]	30.0	[24.1–36.6]	4.2	[2.8–6.5]	1 024
Asian/Indian	12.4	[9.0–16.8]	36.8	[22.9–53.2]	40.4	[25.8–57.0]	10.4	[7.5–14.1]	604
Total	38.9	[36.3–41.7]	37.6	[35.3–39.9]	18.2	[16.1–20.6]	5.2	[4.0–6.8]	5 883

** The totals vary as some individuals did not provide all their demographic information.*

95% CI: 95% confidence interval

3.2.3 Reported monthly income

In terms of reported monthly income by sex, the data showed more females (16%) than males (7%) in the lower income level of R1 to R800, and at level R801 to R3 200, males (31%) and females (32%) were almost equal. Income disparity among the sexes started to reveal itself as income levels increased as at the level R3 201 to R12 800 males were at 15% whereas females were at 9% and at level R12 801 to R51 200, males were at 5% and females were at 2%. By age, the majority of those 18 to 24 years of age have no income (67%) and as age increased, the number of those with no income decreased (Table 3.2.3). A total of 33% of respondents reported no income. The majority of participants in each age group earned between R801 and R3 200 per month. A sizeable percentage of the respondents surveyed in urban formal (28%), urban informal (38%) and rural informal (42%) households, reported that they had no source of income. Interestingly, 53% of rural formal dwellers reported earning between R801 and R3 200 per month, while 21% reported no income. Four of the nine provinces, Mpumalanga (47%) followed by North West (44%), Eastern Cape (43%), and Northern Cape (41%) had the most people who reported no income. In Gauteng 6% of respondents and in Western Cape 5% of respondents reportedly earned a monthly salary of between R12 801 and R51 200. In terms of race, 35% of black African, 27% of coloured and 22% of Asian/Indian people stated that they had no monthly income. Racial disparity in income was evident with whites earning more per month than other race groups. Thirty per cent of white respondents earned between R12 801 and R51 200, while the large minorities of coloured (34%), black African (32%) and Indian/Asian (21%) respondents reported earning between R801 and R3 200 per month.

3.2.4 Reported source of income

The reported source of income by sex showed gender disparity where more men (46%) as opposed to females (32%) received salaries and wages and where more females (27%) relied on pensions, grants and UIF than males (15%).In terms of age as indicated by those that receive an income, the majority of those between 18 to 54 years of age received salaries and wages while those who were older mainly relied on pensions, grants and UIF as an income source (Table 3.2.4). The results showed income inequalities by locality type where rural formal respondents (57%) were more likely than urban formal participants (46%) and urban informal participants (39%) to earn salaries and wages. Rural informal participants were less likely than all other locality groups to earn salaries and wages but just over a third of them relied on pensions, grants and UIF. Thirty-two per cent of respondents from KwaZulu-Natal, 31% from North West, and 30% from Eastern Cape also reported pensions, grants and UIF contributing to their earnings. Above all, whites had the largest proportions of all race groups derived their income from salaries and wages as only 14.2% did not have any income, when this was compared to about one third of the other races who did not have any income (black Africans: 36%, coloureds: 29%, and Asians/Indians: 20%).

Discussion

In order to fully understand the generalisability of this study, it is important to evaluate how this study population compares to the rest of South Africa. In terms of education, we find that when comparing to the South African Census 2011 (Stats SA 2012a), this survey had almost the same percentage of people with no schooling (8.1%), compared to the 2011 Census (8.6%). The census population, though, recorded more people to have completed matric (28.9%) and tertiary education (11.8%) (Stats SA 2012a) than this study shows (18.6% and 6.9% respectively).

Table 3.2.3: Participants' reported monthly income in categories by locality, province and race, South Africa 2012

Background characteristics	No income		R1 to R800		R801 to R3 200		R3 201 to R12 800		R12 801 to R51 200		R51 201+		Refused to answer		Total*
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex															
Male	30.7	[27.9–33.5]	7.4	[5.9–9.1]	31.1	[28.5–33.9]	14.9	[12.9–17.2]	5.2	[4.0–6.7]	0.5	[0.3–1.0]	10.3	[8.6–12.3]	4 942
Female	33.9	[31.5–36.4]	15.5	[13.4–17.9]	31.8	[29.6–34.0]	9.2	[7.2–11.6]	2.2	[1.7–3.0]	0.2	[0.1–0.4]	7.1	[5.8–8.7]	6 482
Total	32.6	[30.4–34.8]	12.1	[10.5–13.8]	31.5	[29.5–33.5]	11.6	[9.8–13.7]	3.5	[2.7–4.4]	0.3	[0.2–0.6]	8.5	[7.1–10.1]	11 424
Age															
18–24	66.7	[62.4–70.7]	8.6	[6.7–10.9]	15.6	[12.6–19.2]	3.9	[2.6–5.8]	0.2	[0.1–0.5]	0.3	[0.1–1.1]	4.8	[3.4–6.6]	1 935
25–34	32.2	[28.6–36.0]	14.2	[11.7–17.2]	26.8	[22.9–31.1]	12.6	[10.3–15.4]	2.7	[1.8–4.0]	0.1	[0.0–0.2]	11.3	[8.4–15.2]	2 533
35–44	24.5	[21.7–27.6]	14.2	[12.0–16.8]	28.0	[25.2–31.0]	17.3	[14.1–21.1]	6.0	[4.4–8.3]	0.4	[0.1–1.2]	9.6	[7.5–12.3]	2 222
45–54	28.8	[25.3–32.5]	11.7	[8.8–15.3]	25.2	[22.2–28.5]	17.1	[13.7–21.2]	6.6	[4.6–9.3]	0.8	[0.3–2.0]	9.9	[8.1–12.0]	2 054
55–64	19.5	[16.5–23.0]	10.7	[7.9–14.2]	45.3	[40.5–50.1]	12.0	[8.2–17.3]	3.5	[2.3–5.3]	0.5	[0.2–1.5]	8.5	[5.5–12.9]	1 518
65 +	4.3	[3.0–6.3]	12.0	[8.1–17.3]	74.5	[68.9–79.5]	3.4	[2.1–5.5]	1.4	[0.7–3.1]	0.0	[0.0–0.1]	4.3	[2.7–6.8]	1 192
Total	32.5	[30.4–34.8]	12.1	[10.5–13.8]	31.5	[29.5–33.5]	11.6	[9.8–13.7]	3.5	[2.7–4.4]	0.3	[0.2–0.6]	8.5	[7.1–10.1]	11 454
Locality															
Urban formal	27.7	[24.8–30.8]	8.5	[6.4–11.3]	28.8	[26.0–31.7]	17.5	[14.4–21.0]	5.7	[4.3–7.6]	0.5	[0.3–1.0]	11.3	[9.1–13.9]	6 414
Urban informal	38.0	[31.4–45.0]	17.3	[13.3–22.3]	32.0	[26.6–38.0]	6.3	[4.4–8.9]	0.2	[0.0–0.6]	0.2	[0.0–0.5]	6.1	[3.1–11.7]	1 344
Rural informal	41.9	[38.1–45.8]	16.1	[13.3–19.3]	31.0	[28.3–33.9]	4.7	[3.7–5.9]	1.2	[0.8–1.8]	0.1	[0.0–0.3]	5.0	[3.3–7.4]	2 429
Rural formal	21.2	[16.5–26.8]	14.1	[10.2–19.2]	53.0	[46.2–59.7]	5.0	[3.0–8.1]	0.9	[0.4–1.8]	0.3	[0.1–1.2]	5.6	[2.7–11.1]	1 267
Total	32.5	[30.4–34.8]	12.1	[10.5–13.8]	31.5	[29.5–33.5]	11.6	[9.8–13.7]	3.5	[2.7–4.4]	0.3	[0.2–0.6]	8.5	[7.1–10.1]	11 454
Province															
Western Cape	27.2	[23.0–31.9]	7.6	[5.9–9.8]	32.2	[26.8–38.0]	13.1	[10.5–16.2]	4.8	[2.7–8.5]	0.2	[0.0–0.8]	14.9	[11.0–19.8]	1 689
Eastern Cape	42.6	[37.0–48.3]	12.2	[9.6–15.3]	32.8	[29.4–36.4]	7.2	[5.2–9.7]	2.0	[1.3–3.2]	0.4	[0.1–1.2]	2.9	[1.6–5.2]	1 403
Northern Cape	41.4	[31.8–51.7]	7.4	[4.6–11.6]	32.1	[25.3–39.7]	8.0	[6.1–10.5]	3.9	[1.8–8.2]	0.1	[0.0–0.4]	7.1	[3.9–12.5]	898
Free State	36.4	[29.8–43.5]	10.6	[7.6–14.5]	40.0	[34.7–45.6]	7.1	[4.3–11.5]	3.5	[1.2–9.7]	0.0		2.4	[0.6–8.4]	747
KwaZulu-Natal	26.7	[21.6–32.4]	19.2	[14.7–24.6]	32.0	[27.4–36.9]	10.4	[6.9–15.3]	2.3	[1.4–4.0]	0.3	[0.1–1.3]	9.1	[5.9–13.9]	1 967
North West	43.8	[37.2–50.5]	10.9	[8.1–14.3]	28.2	[23.5–33.4]	5.0	[3.0–8.3]	0.8	[0.3–1.8]	0.2	[0.0–0.8]	11.3	[8.0–15.6]	1 088
Gauteng	24.9	[20.6–29.8]	9.6	[6.2–14.6]	28.5	[23.9–33.7]	18.9	[13.8–25.4]	5.7	[3.6–8.8]	0.6	[0.2–1.4]	11.8	[8.4–16.3]	1 674
Mpumalanga	46.8	[40.7–53.0]	8.1	[6.0–11.0]	32.1	[27.6–36.9]	8.7	[5.8–12.9]	1.4	[0.6–3.1]	0.4	[0.1–1.5]	2.5	[1.4–4.6]	1 081
Limpopo	36.3	[30.0–43.1]	17.2	[12.7–22.9]	34.8	[29.2–40.9]	6.8	[4.8–9.6]	2.7	[1.4–5.2]	0.2	[0.1–0.5]	1.9	[0.9–3.9]	907
Total	32.5	[30.4–34.8]	12.1	[10.5–13.8]	31.5	[29.5–33.5]	11.6	[9.8–13.7]	3.5	[2.7–4.4]	0.3	[0.2–0.6]	8.5	[7.1–10.1]	11 454
Race															
Black African	34.6	[32.2–37.1]	13.6	[11.7–15.6]	32.3	[30.1–34.6]	10.3	[8.2–12.8]	2.0	[1.5–2.7]	0.2	[0.1–0.4]	7.0	[5.5–8.9]	7 276
White	12.4	[7.9–19.0]	0.8	[0.4–2.0]	13.1	[8.9–19.0]	21.4	[15.5–28.9]	29.6	[21.6–39.0]	3.9	[1.7–8.8]	18.7	[12.6–26.9]	612
Coloured	26.8	[22.8–31.3]	7.0	[5.3–9.0]	34.2	[28.9–40.0]	14.7	[12.0–18.0]	4.4	[2.7–7.2]	0.1	[0.0–0.3]	12.8	[9.2–17.5]	2 424
Indian/Asian	21.6	[15.8–28.7]	1.2	[0.5–2.7]	20.6	[17.5–24.2]	26.5	[18.3–36.8]	7.9	[5.5–11.2]	0.5	[0.1–2.0]	21.7	[10.6–39.3]	1 067
Total	32.6	[30.4–34.8]	12.1	[10.5–13.8]	31.5	[29.5–33.6]	11.6	[9.8–13.7]	3.5	[2.7–4.4]	0.3	[0.2–0.6]	8.5	[7.1–10.1]	11 379

95% CI: 95% confidence interval

** The totals vary as some individuals did not provide all their demographic information.*

Table 3.2.4 Participants' reported sources of income by locality, province and race, South Africa 2012

Background characteristics	Salaries/wages		Remittances		Pensions/grants/ UIF		Sale of products and services		No income		Refused to answer		Don't know		Total*
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex															
Male	45.5	[42.3–48.7]	1.4	[0.8–2.5]	14.6	[12.9–16.4]	3.5	[2.8–4.5]	32.4	[29.6–35.3]	2.2	[1.1–4.2]	0.5	[0.3–0.8]	5 280
Female	32.4	[29.9–35.1]	0.9	[0.5–1.5]	27.4	[24.9–30.1]	3	[2.3–3.8]	34.9	[32.6–37.3]	1.0	[0.7–1.5]	0.4	[0.2–0.8]	6 923
Total	38.0	[35.5–40.5]	1.1	[0.7–1.7]	22.0	[20.0–24.0]	3.2	[2.7–3.8]	33.8	[31.8–35.9]	1.5	[0.9–2.4]	0.4	[0.3–0.7]	12203
Age															
18–24	20.3	[17.1–23.9]	1.6	[0.8–3.2]	7.3	[5.6–9.3]	1.4	[0.8–2.4]	67.9	[63.8–71.7]	1.5	[0.5–4.0]	0.2	[0.1–0.4]	2 145
25–34	50.3	[46.8–53.9]	0.8	[0.4–1.6]	10.2	[8.0–13.1]	3.0	[1.9–4.7]	32.9	[29.2–36.8]	1.9	[0.9–3.7]	0.8	[0.3–2.1]	2 693
35–44	54.1	[50.4–57.7]	1.3	[0.6–2.5]	14.0	[11.8–16.6]	3.9	[2.9–5.3]	25.0	[22.3–28.0]	1.4	[0.8–2.3]	0.3	[0.1–0.6]	2 346
45–54	49.1	[44.7–53.6]	1.7	[0.7–3.8]	11.9	[9.9–14.2]	5.4	[4.1–7.2]	29.5	[26.1–33.2]	1.9	[0.9–4.0]	0.5	[0.2–0.9]	2 151
55–64	30.1	[26.1–34.4]	0.7	[0.4–1.5]	43.3	[39.4–47.3]	3.8	[2.5–5.9]	20.6	[17.7–23.9]	1.1	[0.6–2.0]	0.3	[0.1–1.0]	1 617
65+	5.4	[3.8–7.8]	0.3	[0.1–0.8]	86.9	[83.2–89.9]	1.6	[0.7–3.4]	4.9	[3.2–7.4]	0.4	[0.2–1.0]	0.4	[0.1–1.5]	1 284
Total	38.0	[35.6–40.5]	1.1	[0.7–1.7]	22.0	[20.0–24.0]	3.2	[2.7–3.8]	33.8	[31.8–35.8]	1.5	[0.9–2.4]	0.4	[0.3–0.7]	12 236
Locality															
Urban formal	46.1	[42.7–49.4]	1.3	[0.7–2.5]	16.4	[14.1–18.9]	3.7	[2.8–4.8]	30.0	[27.2–32.9]	2.1	[1.1–3.8]	0.5	[0.2–1.1]	6843
Urban informal	39.0	[34.1–44.2]	0.9	[0.4–1.7]	18.2	[15.1–21.6]	3.3	[2.1–4.9]	37.5	[31.3–44.0]	0.9	[0.4–1.8]	0.4	[0.1–1.0]	1424
Rural informal	18.6	[16.3–21.2]	0.9	[0.5–1.6]	34.7	[31.5–38.0]	2.7	[2.0–3.5]	42.1	[38.6–45.7]	0.6	[0.4–1.2]	0.4	[0.2–0.7]	2601
Rural formal	56.6	[49.0–63.9]	0.9	[0.4–1.9]	15.6	[11.7–20.5]	2.0	[1.2–3.3]	23.3	[17.9–29.7]	1.4	[0.5–3.6]	0.3	[0.1–0.7]	1368
Total	38.0	[35.6–40.5]	1.1	[0.7–1.7]	22.0	[20.0–24.0]	3.2	[2.7–3.8]	33.8	[31.8–35.8]	1.5	[0.9–2.4]	0.4	[0.3–0.7]	12236
Province															
Western Cape	51.6	[46.3–57.0]	0.9	[0.3–3.0]	13.8	[11.0–17.0]	2.3	[1.5–3.4]	29.3	[25.2–33.8]	1.9	[0.5–6.5]	0.2	[0.0–0.6]	1774
Eastern Cape	23.5	[19.6–27.9]	1.1	[0.5–2.5]	29.5	[24.6–34.9]	1.6	[0.9–2.9]	42.9	[37.1–48.9]	0.9	[0.4–1.9]	0.4	[0.1–1.7]	1443
Northern Cape	35.8	[27.8–44.6]	0.1	[0.0–0.4]	21.6	[17.9–25.8]	1.6	[0.9–3.1]	40.7	[31.2–50.9]	0.2	[0.1–0.7]	0.0		925
Free State	34.5	[27.8–41.8]	0.9	[0.3–2.9]	20.7	[15.8–26.6]	4.5	[2.9–7.0]	37.3	[31.5–43.6]	1.5	[0.4–5.8]	0.6	[0.3–1.5]	775
KwaZulu-Natal	34.3	[28.6–40.5]	0.6	[0.3–1.6]	31.6	[26.8–36.8]	2.7	[1.8–3.9]	29.2	[24.6–34.2]	1.1	[0.5–2.1]	0.5	[0.3–1.1]	2117
North West	23.1	[17.9–29.3]	2.0	[0.9–4.6]	30.5	[25.2–36.3]	2.1	[1.3–3.6]	40.4	[34.6–46.4]	1.6	[0.7–3.5]	0.3	[0.0–1.5]	1215
Gauteng	50.0	[44.9–55.0]	1.3	[0.5–3.6]	13.0	[9.9–16.9]	4.6	[3.3–6.5]	28.2	[24.1–32.8]	2.3	[1.0–5.5]	0.5	[0.1–1.7]	1871
Mpumalanga	30.3	[24.3–37.1]	1.2	[0.6–2.2]	18.2	[15.6–21.2]	3.1	[2.2–4.5]	46.4	[40.6–52.2]	0.5	[0.2–1.6]	0.2	[0.1–0.7]	1145
Limpopo	30.3	[21.9–40.1]	1.0	[0.3–2.7]	27.9	[22.6–33.9]	3.5	[2.2–5.5]	36.2	[30.1–42.8]	0.5	[0.2–1.2]	0.7	[0.3–1.7]	971
Total	38.0	[35.6–40.5]	1.1	[0.7–1.7]	22.0	[20.0–24.0]	3.2	[2.7–3.8]	33.8	[31.8–35.8]	1.5	[0.9–2.4]	0.4	[0.3–0.7]	12236
Race															
Black African	35	[32.2–37.9]	1.2	[0.7–1.9]	23.3	[21.1–25.8]	3.2	[2.6–4.0]	35.6	[33.4–37.9]	1.2	[0.6–2.2]	0.4	[0.2–0.7]	7831
White	57.2	[48.8–65.2]	0.4	[0.2–1.2]	17.7	[12.1–25.1]	5.9	[3.4–10.1]	14.2	[9.9–20.1]	3.8	[1.0–13.7]	0.7	[0.1–4.5]	638
Coloured	51.8	[47.2–56.3]	1.1	[0.4–3.1]	14.5	[11.8–17.8]	1.6	[1.1–2.5]	29.0	[25.2–33.2]	1.9	[0.5–6.7]	0.0	[0.0–0.1]	2541
Indian/Asian	52.4	[46.0–58.7]	0.4	[0.1–1.0]	14.9	[12.0–18.2]	3.2	[1.6–6.6]	20.3	[16.0–25.5]	5.7	[2.5–12.3]	3.1	[1.0–9.5]	1145
Total	38	[35.6–40.5]	1.1	[0.7–1.7]	22.0	[20.1–24.0]	3.2	[2.6–3.8]	33.8	[31.8–35.8]	1.5	[0.9–2.4]	0.4	[0.3–0.7]	12155

** The totals vary as some individuals did not provide all their demographic information.*

Interestingly, in terms of income, the racial disparities as seen by the Income and Expenditure (IE) survey 2010/2011 (Stats SA 2012b) is clearly visible in this survey where more of the white population group are found in the higher income categories. On a positive note as mentioned in the IE survey, the largest increases in income in population groups were seen in non-white households (ibid.). Similarly to the IE survey (ibid.), this survey also found that the largest proportion of household income was derived from paid work.

3.3 Health status of adults: national estimates of NCDs and major risk factors

NCDs are on the increase globally and in South Africa. Their importance for global public health and international development agenda was indicated by the UN General Assembly meeting convened in September 2011 which observed that cardiovascular diseases, cancers, lung disease and diabetes were the main contributing factors to poor health and socio-economic difficulties particularly in the developing countries (UN General Assembly 2011). In South Africa, consensus was reached at the South African Summit on the Prevention and Control of Non-Communicable diseases in Gauteng on 12 and 13 September 2011 that NCDs require intensified national action including a strategic plan that addresses prevention, early detection, behavioural change and universal treatment (DoH 2011). Efforts to generate representative information on population levels of NCDs started with the South African Demographic and Health Surveys (SADHS) in 1998 and 2003. SANHANES-1 was established as a population health survey that combines questionnaire-based information, clinical examination and tests as well as disease-specific biomarker determination for NCD and broader health status surveillance. SANHANES-1 provides critical information to map the emerging epidemic of NCDs in South Africa.

3.3.1 Self-reported rates of family history of NCDs

To understand the disease profile of a country, it is important to identify risk factors that predispose a population to specific disease conditions, such as hypertension, heart diseases, stroke and diabetes. Family medical history is widely recognised as a reliable tool in predicting risk for NCDs in individuals (McGrath & Edwards 2009) such as diabetes (Annis, Caulder, Cook et al. 2005; McGrath & Edwards 2009) and cardiovascular disease (Claassen, Henneman, Janssens et al. 2010). This is because family history includes genetic characteristics and shared environmental as well as behavioural factors (Annis, Caulder, Cook et al. 2005; Claassen, Henneman, Janssens et al. 2010; Maradieque & Edwards 2006). It has utility in the following areas: in screening people for disease prevention (primary prevention), for diagnostic purposes and in deciding on appropriate referrals for suspected symptoms. Family medical history is also important for developing interventions such as individualised lifestyle modification interventions for patients known to be at increased risk of diseases and their sequelae such as disability and death (secondary prevention). Finally, it is also important in developing generalised population based health promotion programmes (Claassen, Henneman, Janssens et al. 2010).

Respondents were, therefore, asked to indicate if any of their blood relatives (parent, sibling or child) had any of the four NCDs: high blood pressure, heart disease, stroke and high blood sugar, and the results were tabulated by sex, age, locality, province and race.

Results

Of the four NCDs listed, respondents were most likely to self-report a family history of high blood pressure (30.9%) followed by family history of high blood sugar (20.7%), while

Table 3.3.1.1: Self-reported rates of family history of non-communicable diseases among all participants by sex, locality, province and race, South Africa 2012

Background characteristics	High blood pressure			Heart attack, angina, chest ain			Stroke			High blood sugar/diabetes		
	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI
Sex												
Males	6 411	27.3	[25.0–29.7]	6 375	6.4	[5.3–7.8]	6 345	7.5	[6.4–8.9]	6 281	19.8	[18.0–21.7]
Females	9 065	34.1	[31.9–36.4]	9 014	8.7	[7.5–10.0]	9 002	10.0	[9.0–11.2]	8 934	21.5	[19.8–23.4]
Total	15 476	30.9	[28.9–32.9]	15 389	7.6	[6.6–8.8]	15 347	8.9	[7.9–9.9]	15 215	20.7	[19.2–22.4]
Locality												
Urban formal	8 384	34.1	[31.0–37.4]	8 334	9.1	[7.4–11.1]	8 319	9.6	[8.2–11.3]	8 236	24.3	[21.8–26.9]
Urban informal	1 923	28.6	[23.8–33.9]	1 913	5.7	[4.3–7.5]	1 902	7.6	[5.6–10.2]	1 888	16.6	[13.8–20.0]
Rural formal	1 877	26.9	[21.2–33.6]	1 867	7.4	[5.5–10.0]	1 861	8.1	[5.9–11.0]	1 853	15.1	[12.9–17.7]
Rural informal	3 298	25.4	[22.6–28.5]	3 280	5.1	[4.2–6.2]	3 271	7.9	[6.5–9.5]	3 244	15.8	[13.4–18.5]
Total	15 482	30.9	[28.9–32.9]	15 394	7.6	[6.6–8.8]	15 353	8.9	[7.9–9.9]	15 221	20.7	[19.2–22.4]
Province												
Western Cape	2 167	38.4	[33.7–43.3]	2 163	12.1	[9.2–15.7]	2 145	14.1	[11.9–16.7]	2 139	24.6	[20.8–28.9]
Eastern Cape	1 661	38.6	[33.2–44.3]	1 652	10.3	[7.6–13.8]	1 647	12.3	[9.0–16.7]	1 634	24.4	[20.2–29.2]
Northern Cape	1 006	41.0	[33.7–48.8]	1 005	11.5	[8.6–15.3]	1 003	8.7	[6.1–12.2]	999	23.0	[18.3–28.4]
Free State	839	45.8	[38.4–53.3]	838	14.2	[11.2–17.9]	835	14.5	[10.7–19.2]	826	26.7	[20.6–33.9]
KwaZulu-Natal	2 570	36.7	[32.2–41.4]	2 551	12.0	[7.9–17.6]	2 549	13.2	[10.8–16.0]	2 514	26.0	[21.9–30.7]
North West	1 950	22.8	[18.6–27.7]	1 938	4.8	[3.0–7.5]	1 926	7.2	[5.3–9.8]	1 912	12.8	[10.1–16.1]
Gauteng	2 653	25.7	[21.7–30.2]	2 626	4.4	[3.1–6.1]	2 632	5.1	[3.6–7.0]	2 611	19.4	[16.3–23.0]
Mpumalanga	1 359	25.8	[20.2–32.4]	1 350	3.8	[2.4–6.2]	1 345	4.9	[3.4–7.0]	1 320	15.7	[11.9–20.5]
Limpopo	1 277	21.8	[17.0–27.5]	1 271	4.0	[2.8–5.6]	1 271	5.6	[4.0–7.8]	1 266	14.4	[11.1–18.4]
Total	15 482	30.9	[28.9–32.9]	15 394	7.6	[6.6–8.8]	15 353	8.9	[7.9–9.9]	15 221	20.7	[19.2–22.4]
Race												
African	10 290	28.5	[26.2–30.8]	10 219	5.6	[4.9–6.5]	10 189	7.9	[6.8–9.1]	10 116	18.8	[17.1–20.6]
White	726	33.4	[26.4–41.2]	724	14.4	[9.3–21.8]	720	10.8	[7.6–15.1]	705	21.6	[16.8–27.2]
Coloured	3 084	44.1	[40.2–48.1]	3 075	11.2	[9.1–13.6]	3 067	14.1	[11.9–16.5]	3 048	28.5	[25.6–31.7]
Asian/Indian	1 331	46.8	[40.1–53.7]	1 324	28.8	[19.5–40.2]	1 325	13.3	[10.1–17.4]	1 299	49.0	[39.1–58.9]
Total	15 431	30.9	[28.9–32.9]	15 342	7.6	[6.6–8.8]	15 301	8.9	[7.9–9.9]	15 168	20.7	[19.2–22.4]
Total	15 482	30.9	[28.9–32.9]	15 394	7.6	[6.6–8.8]	15 353	8.9	[7.9–9.9]	15 221	20.7	[19.2–22.4]

95% CI: 95% confidence interval

fewer respondents reported a family history of stroke (8.9%) and heart diseases (heart attack, angina, chest pain; 7.6%) (Table 3.3.1.1). Female respondents were significantly more likely than males to report a family history of high blood pressure, 34.1% and 27.3%, and of stroke, 10% and 7.5%, respectively. There were no significant differences between males and females who reported a family history of heart disease and high blood sugar.

The rate of self-reported family history of all the four assessed conditions was highest among respondents in urban formal settings. Among respondents who self-reported a family history of high blood pressure and heart disease, those in urban formal settings had a significantly higher rate (34.1% and 9.1%) than those in rural informal settings (25.4% and 5.1%) respectively. Furthermore, urban formal residents were significantly more likely (24.3%) than those in all other localities (15.1%–16.6%) to report a family history of high blood sugar. There were no significant differences across localities for those who reported a family history of stroke.

Respondents in the Free State had the highest rate of self-reported family history for all four NCDs listed; high blood pressure (45.8%), heart disease (14.2%), stroke (14.5%) and high blood sugar (26.7%). Respondents in Limpopo self-reported the lowest rate of family history (21.8%) for high blood pressure, while Mpumalanga self-reported the lowest rate of family history for both heart disease and stroke in (3.8% and 4.9% respectively), and North West (12.8%) had the lowest rate for high blood sugar. Among respondents who self-reported a family history of high blood pressure, Free State was followed closely by Northern Cape (41%) and Eastern Cape (38.6%), however, there were no significant differences between these provinces.

The rate of self-reported family history of high blood pressure, heart disease and high blood sugar was highest among Indians (46.8%, 28.8% and 49% respectively), while coloureds had the highest self-reported family history rate of stroke (14.1%). Black Africans on the other hand, had the lowest self-reported family history rate of all four NCDs. Significant differences in rates occurred between Indians (46.8%) and black Africans (28.5%) for high blood pressure; between Indians (28.8%), coloureds (11.2%) and black Africans (5.6%) for heart disease; between coloureds (14.1%) and black Africans (7.9%) for stroke and between Indians and all other race groups for high blood sugar.

3.3.2 Self-reported rates of personal history of NCDs

Self-reported personal history of NCD rates was assessed among all adult participants in order to capture the country's NCD profile. Rates of previously diagnosed, self-reported high blood pressure, heart disease, stroke, high blood cholesterol and high blood sugar status was established by asking whether a respondent had ever been told by a doctor, nurse or health care worker at a clinic or hospital that the respondent had any of these conditions.

Results

The rates of the five conditions among males (Table 3.3.2.1) and females (Table 3.3.2.2) is presented by age, locality, province and race. Females had a significantly higher self-reported rate than males for high blood pressure (20.6% and 12.0%), heart disease (2.9% and 1.5%) and high blood sugar (6% and 4%) respectively. Among both males and females, the reported rate of all NCDs tended to increase with age. The age groups with the highest rate were 65 years of age and older, 55–64 years of age and 45–54 years of age. In males, there was a significant difference between all three age groups for high blood pressure (46.9%, 30.9% and 21.7%); the 55–64 years of age group had a significantly higher rate (6.1%) when compared with those 45–54 years of age (1.9%) for heart disease;

the 45–54 years of age group had a significantly lower rate (1.9%) than both the 55–64 and 65years of age and older age groups for stroke (6.1% and 9.1% respectively). For both high blood cholesterol and high blood sugar, there were no significant differences between the three highest ranking age groups. Similar results were seen in females. For high blood pressure, those 45–54 years of age had a significantly lower rate (35.7%) than both the 55–64 and 65 years of age and older age groups (46.5% and 52.9% respectively). For heart disease, the 45–54 years of age group had a significantly lower rate (3.5%) than the 55–64 years of age group (9.5%). For stroke, high blood cholesterol and high blood sugar, there were no significant differences between the three highest ranking age groups.

There were no significant differences between the rates of self-reported personal history of high blood pressure, heart disease and stroke among both males and females in different localities. Rates of self-reported personal history of both high blood cholesterol and high blood sugar was significantly higher among males in urban formal settings (5.7% and 5.1% respectively) compared with urban informal (0.6% and 1.8% respectively) and rural informal (1.2% and 2.5% respectively) settings. Females residing in urban formal settings had a significantly higher rate of self-reported personal history of high blood cholesterol (6.4%) compared to females in all other settings (1.6%–2.3%), while females residing in urban formal settings had a significantly higher rate of self-reported personal history of high blood sugar (6.9%) than in females in urban informal settings (3.7%).

Provincially, for males, the highest rate for each self-reported NCD was recorded in a different province. For high blood pressure, males in the Free State (16.3%), KwaZulu-Natal (15.8%) and Western Cape (15.3%) had the highest rate; however, there were no significant differences between these provinces. For those who self-reported personal history of stroke, males in the Western Cape (4.4%), Mpumalanga (3.5%) and Northern Cape (2.7%) had the highest rate. There were also no significant differences between these provinces. For high blood cholesterol, there were also no significant differences between the three highest ranking provinces: Eastern Cape (7%), Western Cape (6.7%) and Free State (5.2%). There were no significant differences in the rates for both self-reported personal history of heart disease and high blood sugar in the different provinces.

For females, provincially, Free State had the highest rate of self-reported existing conditions for high blood pressure and heart disease, while KwaZulu-Natal had the highest rate for self-reported stroke and high blood sugar, and Western Cape had the highest rate of self-reported personal history of high blood cholesterol. There were no significant differences between the three highest ranking provinces for high blood pressure: Free State (28.7%), Northern Cape (27.8%) and Western Cape (26.5%). Similarly, there were no significant differences between the three highest ranking provinces for heart disease: Free State (7.2%), KwaZulu-Natal (5.6%) and Mpumalanga (3.7%); stroke: KwaZulu-Natal (4%), Mpumalanga (3.3%) and Western Cape (2.6%); high blood cholesterol: Western Cape (7.3%), Free State (5.2%) and Gauteng (5.2%); and high blood sugar: KwaZulu-Natal (9.6%), Northern Cape (7.9%) and Western Cape (7.6%).

Among males, the white race group had the highest rate of self-reported personal history of high blood pressure, stroke and high blood cholesterol, while Indians, had the highest rate of self-reported personal history of heart disease and high blood sugar. Black African males had the lowest rate of high blood pressure, heart diseases, high blood cholesterol and high blood sugar 10.4%, 1.1%, 1.7% and 3%, respectively. For high blood pressure and high blood cholesterol, the rate among black African males was significantly lower than for males of all races (15.9% to 18.9%) and (5.5% to 15.5%) respectively; for heart diseases it was significantly lower than the rate among Indian males (5.5%); and for high blood sugar it was significantly lower than among coloured (5.7%) and Indian (13.6%) males.

Table 3.3.2.1: Rates of self-reported personal history of non-communicable diseases among male participants by age, locality, province and race, South Africa 2012

Males															
Background characteristics	High blood pressure			Heart disease			Stroke			High blood cholesterol			High blood sugar/diabetes		
	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI
Age															
15 to 24	2 012	2.0	[1.3–3.0]	2 004	0.2	[0.1–0.5]	2 003	0.3	[0.2–0.7]	1 915	0.4	[0.2–1.3]	1 992	0.3	[0.1–0.7]
25–34	1 284	5.0	[3.5–7.0]	1 280	0.8	[0.4–1.5]	1 284	0.4	[0.2–0.8]	1 239	0.6	[0.2–1.7]	1 273	0.8	[0.4–1.8]
35–44	981	11.5	[8.9–14.7]	980	1.2	[0.6–2.7]	978	1.2	[0.6–2.2]	957	2.4	[1.5–3.7]	975	2.5	[1.5–4.2]
45–54	915	21.7	[17.6–26.4]	911	1.9	[1.1–3.2]	911	1.9	[1.1–3.2]	888	8.7	[5.2–14.2]	910	9.8	[6.9–13.8]
55–64	728	30.9	[25.9–36.5]	724	6.1	[3.9–9.3]	728	6.1	[4.0–9.3]	707	13.2	[7.3–22.6]	721	12.7	[9.6–16.5]
65+	485	46.9	[39.2–54.8]	482	4.4	[2.6–7.1]	483	9.1	[5.2–15.5]	469	15.5	[9.4–24.5]	479	15.7	[10.9–22.0]
Total	6 405	12.0	[10.7–13.4]	6 381	1.5	[1.1–1.9]	6 387	1.7	[1.3–2.2]	6 175	3.9	[2.9–5.2]	6 350	4.0	[3.3–4.8]
Locality															
Urban formal	3 518	12.8	[10.8–15.1]	3 504	1.5	[1.0–2.2]	3 502	1.7	[1.1–2.4]	3 389	5.7	[4.0–8.0]	3 485	5.1	[4.0–6.5]
Urban informal	762	9.1	[6.2–13.2]	762	1.7	[0.9–3.0]	762	1.4	[0.7–2.9]	728	0.6	[0.2–1.6]	755	1.8	[1.0–3.1]
Rural formal	854	11.2	[8.5–14.6]	853	1.5	[0.7–3.2]	853	1.7	[0.9–3.1]	828	2.0	[1.0–4.0]	850	2.8	[1.7–4.6]
Rural informal	1 276	11.4	[9.5–13.5]	1 266	1.4	[0.9–2.3]	1 275	1.8	[1.2–2.7]	1 235	1.2	[0.8–1.9]	1 265	2.5	[1.8–3.3]
Total	6 410	12	[10.7–13.4]	6 385	1.5	[1.1–1.9]	6 392	1.7	[1.3–2.2]	6 180	3.9	[2.9–5.2]	6 355	4.0	[3.3–4.8]
Province															
Western Cape	920	15.3	[11.8–19.6]	918	1.8	[1.0–3.1]	918	4.4	[2.5–7.8]	889	6.7	[3.9–11.4]	916	5.7	[3.9–8.2]
Eastern Cape	698	12.3	[9.2–16.3]	696	1.4	[0.6–3.2]	697	1.4	[0.7–2.9]	680	7.0	[4.0–11.9]	692	3.2	[2.0–5.3]
Northern Cape	415	15.0	[11.1–19.9]	415	2.3	[0.9–5.4]	415	2.7	[1.1–6.1]	410	2.2	[0.9–5.5]	412	5.5	[3.0–9.8]
Free State	354	16.3	[10.6–24.2]	353	2.4	[1.0–5.8]	353	0.8	[0.3–1.9]	344	5.2	[2.2–11.9]	351	6.5	[3.2–12.8]
KwaZulu-Natal	1 080	15.8	[13.1–19.0]	1 069	2.3	[1.4–3.8]	1 072	1.9	[1.1–3.1]	1 033	5.1	[1.9–12.9]	1 067	4.6	[3.2–6.6]
North West	763	12.0	[8.5–16.7]	757	1.2	[0.5–2.5]	759	1.8	[0.9–3.3]	725	1.5	[0.8–2.7]	745	2.7	[1.8–4.1]
Gauteng	1 139	9.7	[7.2–13.0]	1 141	0.6	[0.2–1.5]	1 138	0.6	[0.3–1.4]	1 091	2.4	[1.2–5.0]	1 135	3.6	[2.2–5.7]
Mpumalanga	542	10.9	[8.0–14.8]	539	2.2	[1.0–5.1]	540	3.5	[2.0–6.1]	526	1.8	[1.0–3.4]	540	3.7	[2.2–6.1]
Limpopo	499	7.4	[5.5–10.0]	497	2.3	[1.0–5.3]	500	1.4	[0.7–3.0]	482	2.7	[1.2–6.2]	497	2.8	[1.7–4.5]
Total	6 410	12.0	[10.7–13.4]	6 385	1.5	[1.1–1.9]	6 392	1.7	[1.3–2.2]	6 180	3.9	[2.9–5.2]	6 355	4.0	[3.3–4.8]
Race															
African	4 174	10.4	[9.1–12.0]	4 158	1.1	[0.8–1.6]	4 163	1.3	[1.0–1.8]	4 018	1.7	[1.1–2.6]	4 136	3.0	[2.4–3.8]
White	330	18.9	[13.4–26.0]	330	2.7	[1.3–5.5]	329	3.8	[1.8–7.5]	326	15.5	[9.1–25.2]	326	6.9	[3.6–12.9]
Coloured	1279	15.9	[12.9–19.4]	1 276	2.0	[1.3–3.2]	1 277	2.5	[1.7–3.7]	1 235	5.5	[2.9–10.0]	1 272	5.7	[4.2–7.6]
Asian/Indian	597	16.9	[12.8–22.0]	591	5.5	[2.8–10.7]	593	1.3	[0.7–2.6]	572	13.7	[8.0–22.7]	593	13.6	[9.6–19.1]
Total	6 380	12	[10.7–13.4]	6 355	1.5	[1.1–1.9]	6 362	1.7	[1.3–2.2]	6 151	3.9	[2.9–5.2]	6 327	4.0	[3.3–4.8]
Total	6 410	12	[10.7–13.4]	6 385	1.5	[1.1–1.9]	6 392	1.7	[1.3–2.2]	6 180	3.9	[2.9–5.2]	6 355	4.0	[3.3–4.8]

95% CI: 95% confidence interval

There was no significant difference in race for self-reported personal history of stroke. Among females the white race group had the highest rate of self-reported personal history of heart disease; however, the rates among whites are based on a small sample size and therefore are unreliable. Coloureds had the highest of self-reported high blood pressure and stroke and Indians had the highest rate of self-reported personal history of high blood cholesterol and high blood sugar. There were no significant differences in race groups for the rate of self-reported personal history of heart disease and stroke. Black African females had a significantly lower rate of high blood pressure (20%) than coloured females (27.2%). Furthermore, black African females had a significantly lower rate of high blood cholesterol (3.7%) and high blood sugar (5.3%) than both coloureds (7.5% and 8% respectively) and Indians (11.7% and 15.6% respectively).

Figure 3.3.2.1: Rates of self-reported personal history of NCDs among male participants, by age, South Africa 2012

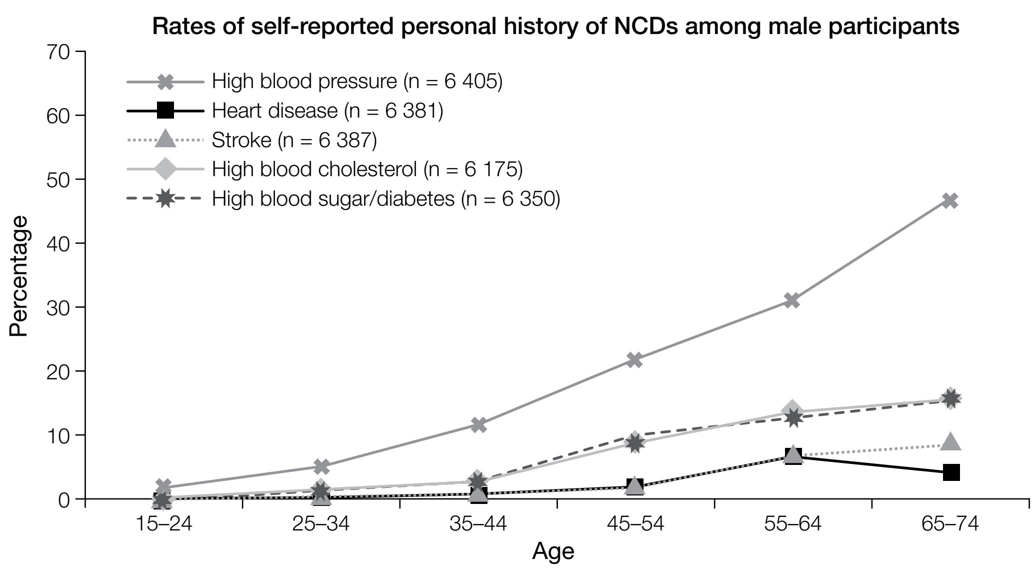


Figure 3.3.2.2: Rates of self-reported personal history of NCDs among female participants, by age, South Africa 2012

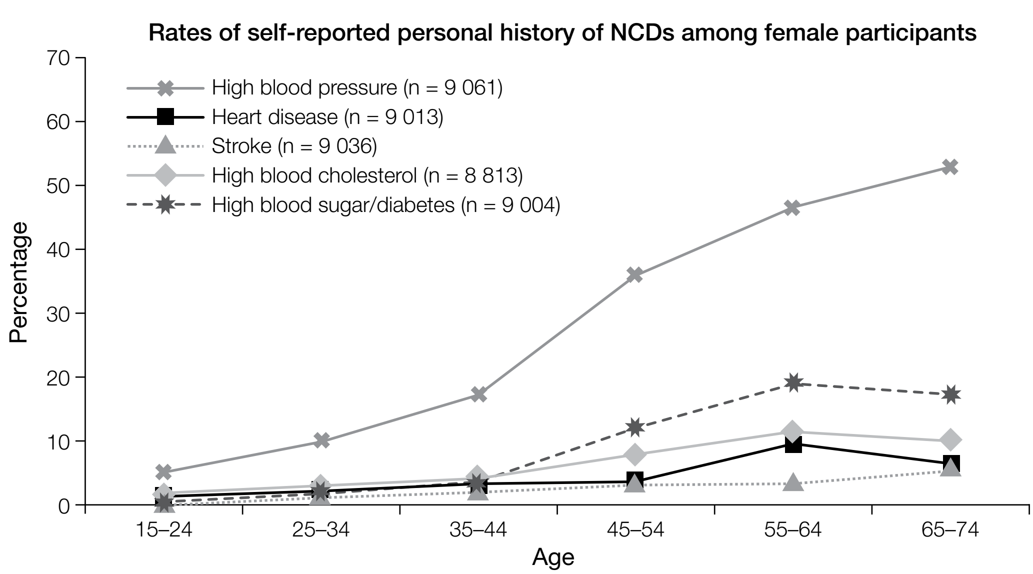


Table 3.3.2.2: Rates of self-reported personal history of non-communicable diseases among female participants by age, sex, locality, province and race, South Africa 2012

Females															
Background characteristics	High blood pressure			Heart disease			Stroke			High blood cholesterol			High blood sugar/diabetes		
	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI
Age															
15–24	2 342	5.1	[4.0–6.5]	2 333	0.3	[0.1–0.8]	2 339	0.5	[0.2–0.9]	2 275	1.3	[0.8–2.1]	2 334	1.0	[0.5–1.8]
25–34	1 771	9.8	[8.2–11.8]	1 765	1.4	[0.9–2.2]	1 765	1.1	[0.7–1.9]	1 724	2.5	[1.5–3.9]	1 761	1.4	[0.9–2.2]
35–44	1 548	17.0	[14.7–19.5]	1 545	3.0	[2.1–4.3]	1 544	1.8	[1.2–2.7]	1 504	3.9	[2.5–6.0]	1 543	3.2	[2.3–4.6]
45–54	1 401	35.7	[31.7–39.9]	1 386	3.5	[2.4–5.0]	1 397	2.8	[2.0–4.1]	1 354	7.6	[5.7–10.0]	1 394	12	[9.2–15.3]
55–64	1 040	46.5	[41.0–52.0]	1 032	9.5	[5.1–17.2]	1 034	3.2	[2.2–4.6]	1 019	11.1	[8.5–14.4]	1 026	19	[13.8–25.4]
65+	952	52.9	[47.3–58.5]	946	6.4	[4.5–9.1]	950	5.4	[3.5–8.2]	931	9.4	[6.7–12.9]	940	17.1	[13.5–21.3]
Total	9 054	20.6	[19.2–22.1]	9 007	2.9	[2.3–3.7]	9 029	1.9	[1.5–2.3]	8 807	4.5	[3.9–5.3]	8 998	6.0	[5.2–7.0]
Locality															
Urban formal	4 862	21.2	[19.1–23.6]	4 832	2.4	[1.5–3.8]	4 846	1.6	[1.2–2.1]	4 726	6.4	[5.4–7.7]	4 832	6.9	[5.6–8.4]
Urban informal	1 158	19.4	[16.2–23.0]	1 153	3.8	[2.6–5.5]	1 155	1.8	[1.0–3.0]	1 126	1.6	[0.9–2.6]	1 152	3.7	[2.6–5.2]
Rural formal	1 020	20.8	[16.3–26.2]	1 018	2.7	[1.8–4.0]	1 021	1.6	[0.8–3.2]	1 005	2.0	[1.2–3.3]	1 016	3.8	[2.6–5.6]
Rural informal	2 021	19.7	[17.4–22.1]	2 010	3.6	[2.7–4.7]	2 014	2.6	[1.9–3.6]	1 956	2.3	[1.6–3.3]	2 004	5.7	[4.6–7.1]
Total	9 061	20.6	[19.2–22.1]	9 013	2.9	[2.3–3.7]	9 036	1.9	[1.5–2.3]	8 813	4.5	[3.9–5.3]	9 004	6.0	[5.2–7.0]
Province															
Western Cape	1 248	26.5	[22.0–31.4]	1 238	1.9	[1.2–2.9]	1 247	2.6	[1.6–4.1]	1 222	7.3	[5.3–9.9]	1 243	7.6	[5.5–10.5]
Eastern Cape	958	24.2	[20.8–27.9]	951	3.4	[2.2–5.4]	955	1.7	[1.0–2.6]	927	4.5	[3.0–6.7]	949	6.8	[5.0–9.3]
Northern Cape	587	27.8	[22.0–34.4]	587	2.7	[1.4–5.0]	588	2.1	[1.1–4.0]	587	2.9	[1.7–4.9]	586	7.9	[5.3–11.6]
Free State	483	28.7	[23.4–34.8]	478	7.2	[4.8–10.6]	482	1.7	[0.7–3.8]	473	5.2	[2.8–9.3]	480	6.3	[4.6–8.5]
KwaZulu-Natal	1 488	24.9	[21.8–28.3]	1 470	5.6	[3.0–10.3]	1 477	4.0	[2.9–5.5]	1 444	4.3	[2.9–6.3]	1 480	9.6	[6.4–14.1]
North West	1 196	23.1	[19.5–27.1]	1 193	2.1	[1.3–3.4]	1 195	2.0	[1.2–3.4]	1 155	2.4	[1.4–4.1]	1 176	5.4	[3.5–8.1]
Gauteng	1 511	15.6	[12.9–18.8]	1 513	1.4	[0.8–2.3]	1 507	0.6	[0.3–1.1]	1 464	5.2	[3.8–7.1]	1 501	4.0	[2.9–5.3]
Mpumalanga	813	14.9	[11.4–19.3]	810	3.7	[2.0–6.9]	808	3.3	[1.6–6.4]	782	3.6	[2.1–6.2]	813	4.7	[3.0–7.2]
Limpopo	777	14.5	[11.7–17.7]	773	2.0	[1.3–3.1]	777	1	[0.5–2.0]	759	2.5	[1.5–4.1]	776	5.0	[3.5–7.0]
Total	9 061	20.6	[19.2–22.1]	9 013	2.9	[2.3–3.7]	9 036	1.9	[1.5–2.3]	8 813	4.5	[3.9–5.3]	9 004	6.0	[5.2–7.0]
Race															
African	6 112	20	[18.4–21.6]	6 081	2.8	[2.3–3.4]	6 090	1.9	[1.5–2.4]	5943	3.7	[3.0–4.5]	6 070	5.3	[4.6–6.1]
White	391	19.5	[13.7–27.0]	390	3.9	[1.1–13.6]	389	0.9	[0.4–2.3]	382	6.5	[3.8–10.7]	388	7.3	[3.4–15.3]
Coloured	1 803	27.2	[24.7–29.9]	1 792	2.2	[1.6–3.1]	1 804	2.7	[2.0–3.8]	1767	7.5	[6.0–9.4]	1 798	8.0	[6.6–9.7]
Asian/Indian	734	20.8	[16.6–25.9]	729	3.0	[1.8–4.9]	732	2.0	[1.0–4.0]	701	11.7	[8.5–16.0]	727	15.6	[10.3–22.9]
Total	9 040	20.6	[19.2–22.1]	8 992	2.9	[2.3–3.7]	9 015	1.9	[1.5–2.3]	8793	4.5	[3.9–5.3]	8 983	6.0	[5.2–7.0]
Total	9 061	20.6	[19.2–22.1]	9 013	2.9	[2.3–3.7]	9 036	1.9	[1.5–2.3]	8813	4.5	[3.9–5.3]	9 004	6.0	[5.2–7.0]

95% CI: 95% confidence interval

Discussion

Key aspects of the findings on NCDs are discussed next.

Self-reported rates of family history of NCDs

Heredity or genetic factors play an important role in the predisposition of certain individuals to developing NCDs. Genetic factors cannot be changed by awareness therefore frequent screening is critical for individuals who are at risk of developing some of these conditions. Family history is an affordable source of information that is used to assess the risk for NCDs and it can be used to guide screening, clinical examination and diagnosis. In this study, it was therefore important to assess participants' family histories of NCDs and rates of previously diagnosed conditions.

Comparisons of the findings of the SANHANES-1 study and the 2003 Demographic and Health Survey – SAHDS (DOH 2008) show similar levels of individuals reporting family histories of high blood pressure (33% in 2003; 31% in 2012). There were no major differences found between female and male respondents between the two studies.

The rate of a reported family history of heart disease is in line with but lower than the 2003 SADHS. This is most likely due to under-reporting. There was no change in overall reported family history of stroke with a rate of 9% reported in both studies. A family history of high blood sugar was not assessed in the SADHS, 2003 but the 20.6% rate among adults in documented in SANHANES-1 provides a baseline for future comparisons.

A high rate of self-reported family histories of all four NCDs was predominant in five of the nine provinces – Western Cape, Eastern Cape, Northern Cape, Free State and KwaZulu-Natal. In addition, a high rate of family history of high blood sugar was reported in Gauteng.

However, between 2003 and 2012, the rate of self-reported family history of high blood pressure decreased in six of the nine provinces: Western Cape, Northern Cape, North West, Gauteng, Mpumalanga and Limpopo. Similarly, the rate of self-reported family history of stroke decreased in these provinces. For the same period, an increased rate of self-reported history of high blood pressure and stroke was observed in the Eastern Cape, Free State and KwaZulu-Natal. The rate of self-reported history of heart disease substantially decreased in all provinces, however, KwaZulu-Natal showed the lowest rate of decline between 2003 and 2012. The observed decrease in the rate of biological risk factors such as family history of high blood pressure and heart disease in the majority of provinces, if true, would be a positive development in the health status of South Africans. However, a limitation to these findings is recall bias and inaccuracies due to poor awareness of health-related matters between generations where respondents might not have had a prior need to note such issues. Due to the fact that variations do exist when it comes to physicians' practices in obtaining adult family histories in primary health care, general awareness of such might be poor among some communities. Also systemic barriers such as poor access to health services could lead to under-detection of NCDs until a late stage, and this may contribute to underestimates of the rate of reported NCDs.

With regard to race, a higher rate of self-reported family history of high blood pressure, heart disease, stroke and high blood sugar was found among coloureds and Indians. In addition, a high rate of family history of heart disease was reported among white respondents. Rates of family history of high blood pressure are similar to the rates reported in the SADHS (2003) – 31%, 34%, 44% and 42% among African, white, Indian and coloured, respectively. SANHANES-1 found lower rates among African and white and a higher rate of family history of high blood pressure among Indian and Coloured races. The high rate of reported family history of all four NCDs among both males and females, in the majority of provinces and race groups suggest that the risk is widespread. There should be more interventions that use this tool to assess risk in the adult population so that individuals who can benefit from further clinical assessments are identified. Screening procedures and counselling services that are currently used among populations that are considered to be at high risk (Puoane, Tsolekile, Caldbick et al. 2012) are inadequate. There is a high rate of people with a biological risk factor for NCDs, therefore there is a need for increased use of cost-effective screening measures such as family history. Health promotion interventions to encourage families to communicate with each other about diagnosis of these risk conditions might also be of benefit.

Self-reported rates of personal history of NCDs

Assessment of the rate of self-reported personal NCDs indicated that the rates of all NCDs increased with age among both males and females. There was a high rate of reported high blood pressure and a high rate among males was found in most races and provinces. Among females, the rate of high blood pressure was highest among coloured females.

A high rate of heart diseases in the 55 years of age and older age groups was only significantly different in comparison to younger people but not to middle-aged adults. It was high among Indian males. There were no race differences in the rate of heart diseases among females.

Stroke mostly affected the 55 years of age and older males and females, and Indian males. But there were no differences in relation to locality of both males and females, race among females and province among males. However, stroke mostly affected females in the Western Cape, KwaZulu-Natal, North West and Mpumalanga.

High blood cholesterol rate among males and females was high in the oldest age groups even though among males there were no significant differences when compared with other adults above 45 years of age. It was also high in urban formal settings. For males, it was also high in the majority of provinces except North West and Mpumalanga, and in all races except black Africans. Among females it was highest among those 55 to 64 years of age and the differences were only significant for those 44 years of age and younger.

Similar to high blood cholesterol, high blood sugar rate among males and females was high in urban formal settings. However, in terms of race, high blood cholesterol mostly affected coloured and Indians males while among females it affected all races except black Africans.

The generally high rates of high blood pressure particularly among females and among the older generation were also reported in SADHS 2003. The lack of significant differences in the rate of self-reported personal high blood pressure, heart diseases and stroke (for males only) among adults supports the growing scientific literature that shows rapid changing patterns of risk for NCDs in developing countries whereby the conditions are found in both affluent and poorer settings (Popkin 2006). On the other hand, the high rate of high blood cholesterol and high blood sugar among both males and females in urban formal settings is similar to the pattern observed in SADHS 1998 and 2003 in relation to the rate of high blood pressure and heart disease. With increasing urbanisation and merging of lifestyles between urban and rural populations the loss of distinctiveness is possible.

It is expected that the intensified measures by government and its partners to respond to NCDs through policies that modify behaviour, early detection and treatment will effect change in the health status of South Africans (Puoane, Tsolekile, Caldbick et al. 2012).

3.3.3 Clinical examination: measured blood pressure

High blood pressure is an important risk factor that contributes significantly to the burden of the cardiovascular diseases stroke and ischaemic heart disease (Ostchega, Dillon et al. 2007). With each 2 mmHg rise in systolic blood pressure, there is an associated 7% increase in risk of death from ischaemic heart disease and a 10% increased risk of death from stroke (NICE 2011). Raised blood pressure is the cause of over 10% of global deaths that are preventable if good control of high blood pressure is achieved. High blood pressure is responsible for a high burden of disease in South Africa (including morbidity and mortality) (Phaswana-Mafuya, Peltzer et al. 2012, Mayosi, Bongani 2009).

High blood pressure is defined as a systolic blood pressure (SBP) ≥ 140 mmHg and/or diastolic blood pressure (DBP) ≥ 90 mmHg (140/90 mmHg). Two or more elevated readings taken over a minimum period of a week are required to diagnose hypertension. The following categories for blood pressure measurements were used in this survey: normal (< 120 mmHg), prehypertension (SBP 120–139 mmHg; DBP 80–89 mmHg) and high blood pressure or hypertension (SBP ≥ 140 mmHg; DBP ≥ 90 mmHg) US Department of Health 2004).

It is important to screen people regularly for high blood pressure as it increases with age, has no specific symptoms, and it can only be detected by being measured. It is recommended that screenings for high blood pressure (as with other cardiovascular diseases) begin at 20 years of age, with a frequency that should be determined at an individual clinical level and by the level of risk. As with other NCDs, there are important lifestyle and behavioural precursors or risk factors for high blood pressure. Risk factors for high blood pressure are shared by other NCDs to a large extent and they include obesity and overweight, tobacco use, unhealthy diet and physical inactivity. The existence of these risk factors has become more prominent over the last century as a consequence of the effects of economic transition and urbanisation. Currently up to 25% of the global burden of disease is linked to behaviour and lifestyle and poorer countries are the most vulnerable, with further disparities within countries according to socio-economic status (WHO 2012).

The pulse rate is a measure of the number of times the heart beats per unit time, usually per one minute. The pulse rate is an indicator of overall health and fitness. The pulse rate for a healthy adult generally ranges between 60 and 100 beats per minute at rest (NICE 2011, ESH guidelines 2003, WHO 2003).

Box 3.1: Classification of hypertension (JNC–7) (US Department of Health 2004)

Blood pressure classification	Systolic blood pressure (mmHg)	Diastolic blood pressure (mmHg)
Normal	< 120	< 80
Prehypertensive	120–139	80–89
Hypertension	> 140	> 90

Results

Mean systolic blood pressure for males (130 mmHg) was significantly higher than for females (127.5 mmHg) but diastolic blood pressure did not differ significantly by gender (Table 3.3.3.1). In this report, the means and prevalence of high blood pressure are reported for the total number of participants. Mean systolic blood pressure increased progressively with increasing age from a mean of 118.1 mmHg (15–24 years of age) to over 149.3 mmHg in the group 65 years of age and older. The mean systolic blood pressure reached prehypertension levels at the group of 25–34 years of age. Mean diastolic blood pressure increased with increasing age for age groups 15–24 (66.4 mmHg) to 45–54 (80.6 mmHg) years of age, plateaued between 54 and 64 years of age, and declined in the older age groups with a mean of 77.6 mmHg in the group 65 years of age and older. Across localities, urban informal (124 mmHg) and rural informal (127.9 mmHg) had the lowest mean systolic blood pressure, while across provinces the highest systolic blood pressures were recorded in the Western Cape (131.8 mmHg), the Free State (133.9 mmHg) and North West (131 mmHg). The white (130.8 mmHg) and coloured race (132.1 mmHg) groups had the highest mean systolic blood pressure. A similar pattern was seen overall for the mean diastolic blood pressure.

The mean pulse rate, beats per minute (bpm) was significantly higher in females (77 bmp) when compared with males (70 bmp) but was similar across all age groups and it ranged between 73 bpm to 75 bpm. Similarly, differences in mean pulse rate by locality, province and race were of no meaningful clinical significance.

Overall 38.2% of participants aged 15 years and older had prehypertensive systolic blood pressures and 20.0% had prehypertensive diastolic blood pressures. More than one third (38.3%) of participants (5% of the participants in the group 15–24 years of age), had systolic blood pressure levels in the prehypertensive and hypertensive ranges (120 mmHg–139 mmHg and ≥ 140 mmHg respectively). There was an age-trend in the prevalence of prehypertensive that increased up to the group 35–44 years of age (45%), thereafter declining to 24.1% in the group 65 years of age and older (Table 3.3.3.2).

An increasing percentage of the population had systolic blood pressures that were high (≥ 140 mmHg) from the group 15–25 years of age (5.3%) to those 65 years of age and older (63.7%). Half (50.5%) of participants 55–64 years of age had a high systolic blood pressure. There were increases in the rates of prehypertensive and hypertensive diastolic blood pressure (80 mmHg–89 mmHg and ≥ 90 mmHg) between the groups 15–24 years of age (8.4% and 2.1% respectively) and 25–34 years of age (17.8% and 6.6%) where the rates of diastolic prehypertension and of diastolic hypertension more than doubled. Almost a third (31.0%) and a quarter (22.7%) of participants in the group 45–54 years of age had prehypertensive and hypertensive diastolic blood pressure levels respectively.

The rural formal areas overall consistently had the highest prehypertensive and hypertensive systolic and diastolic blood pressures when compared with other areas of residence. The provincial rates of systolic prehypertension ranged between 32.4% and 46.1%; the provincial diastolic prehypertensive rates ranged from 14.5% to 27.3%. The systolic hypertensive rates ranged from 19.0% to 29.4% and diastolic hypertensive blood pressures ranged from 8.3% to 19.4% across the provinces. By race, the black African and Indian race groups had the lowest rates of prehypertensive and hypertensive blood pressures.

Table 3.3.3.1: Mean systolic and diastolic blood pressure and mean pulse rate among all participants 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	Systolic blood pressure (mmHg)			Diastolic blood pressure (mmHg)			Pulse rate (bpm**)		
	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI	n
Sex									
Male	130.09	[128.96–131.23]	2 474	73.27	[72.44–74.10]	2 474	69.9	[69.13–70.63]	2 472
Female	127.55	[126.46–128.64]	4 556	74.54	[73.92–75.17]	4 555	77.2	[76.43–77.93]	4 552
Age									
15–24	118.11	[117.35–118.88]	1 886	66.44	[65.71–67.17]	1 886	73.6	[72.73–74.42]	1 885
25–34	121.72	[120.26–123.18]	1 166	72.47	[71.47–73.46]	1 165	75.0	[74.00–76.08]	1 165
35–44	128.12	[126.56–129.67]	1 069	77.03	[75.78–78.29]	1 069	74.2	[72.86–75.46]	1 066
45–54	135.39	[133.76–137.01]	1 126	80.59	[79.60–81.58]	1 127	75.0	[73.86–76.15]	1 127
55–64	141.47	[138.83–144.12]	946	79.99	[78.72–81.27]	945	74.4	[71.85–76.86]	944
65+	149.33	[146.57–152.08]	829	77.65	[76.24–79.06]	829	73.7	[72.22–75.23]	829
Locality									
Urban formal	129.58	[128.04–131.12]	3 424	74.95	[74.06–75.84]	3 422	73.9	[72.83–74.90]	3 419
Urban informal	123.98	[122.01–125.94]	805	72.47	[70.90–74.04]	805	73.5	[72.16–74.87]	804
Rural formal	130.07	[127.83–132.31]	941	75.59	[73.97–77.22]	942	75.0	[73.69–76.25]	942
Rural informal	127.90	[126.55–129.25]	1 860	72.72	[71.76–73.68]	1 860	74.9	[73.90–75.83]	1 859
Province									
Western Cape	131.79	[129.10–134.48]	1 189	74.61	[73.36–75.87]	1 190	71.2	[69.73–72.71]	1 190
Eastern Cape	129.12	[126.95–131.28]	991	73.17	[71.77–74.58]	991	73.7	[72.39–75.09]	990
Northern Cape	127.13	[123.75–130.50]	453	74.32	[72.25–76.39]	453	78.0	[76.08–79.86]	453
Free State	133.94	[131.59–136.30]	382	78.33	[75.93–80.74]	382	76.8	[71.76–81.87]	381
KwaZulu-Natal	127.30	[125.40–129.19]	1 111	73.08	[71.55–74.61]	1 111	74.1	[72.76–75.38]	1 111
North West	130.98	[128.38–133.58]	679	73.48	[71.83–75.13]	679	76.8	[74.93–78.72]	678
Gauteng	128.05	[125.37–130.72]	795	76.25	[74.79–77.71]	794	74.0	[72.54–75.51]	793
Mpumalanga	124.37	[122.67–126.06]	828	70.78	[69.09–72.47]	828	75.4	[74.01–76.80]	828
Limpopo	126.18	[124.09–128.27]	602	71.99	[70.68–73.30]	601	75.2	[73.42–76.87]	600
Race									
African	128.07	[127.06–129.07]	4 826	73.82	[73.17–74.48]	4 825	74.5	[73.80–75.20]	4 821
White	130.81	[124.28–137.33]	134	74.04	[71.29–76.79]	133	71.7	[69.28–74.11]	132
Coloured	132.14	[130.37–133.92]	1 563	75.60	[74.69–76.51]	1 564	72.9	[71.27–74.57]	1 564
Indian	124.34	[121.46–127.22]	352	74.53	[69.46–79.60]	352	77.8	[75.92–79.69]	352
Total	128.56	[127.65–129.48]	7 030	74.04	[73.46–74.61]	7 029	74.3	[73.65–74.89]	7 024

95% CI: 95% confidence interval
**bmp, beats per minute

Hypertension was present in 10.2% of the participants in the survey with no gender differences. Overall, one out five participants older than 45 years of age had hypertension, a prevalence that was highest (14.2%) among residents in the rural formal areas, in the Free State (17.3%) and the white race group (12.2%) (Table 3.3.3.2).

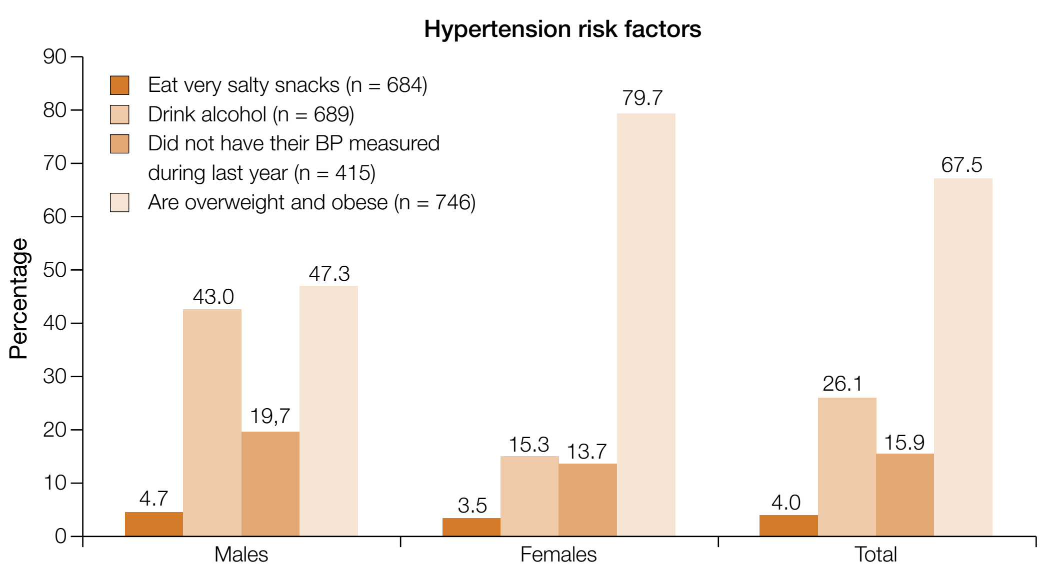
Hypertension risk factors for males and females

There are a number of risk factors that contribute to hypertension and to its control (NICE 2011). Reduction of these risk factors is targeted through lifestyle modifications in order to reduce high blood pressure and the rate at which it progresses with age (NICE 2011). The adoption of healthy lifestyles is generally accepted to be the cornerstone in the management of hypertension. The early initiation of healthy lifestyle promoting behaviours can ameliorate most risk factors for hypertension and cardiovascular diseases. Interventions that have been shown to reduce high blood pressure include weight loss (alternately, and preferably, maintaining optimal BMI); adoption of the DASH (Dietary Approaches to Stop Hypertension diet (Hajjar, Kotchen et al. 2006)[1], regular physical activity and limited alcohol intake (US Department of Health 2004).

Results

Of those respondents who were volunteered to undergo clinical examination and were found to have high blood pressure, most had measured their blood pressures in the past year (84.1%), more than two-thirds were overweight or obese, and less than a third drank alcohol. There was a significant difference between the percentages of males (43.0%) and females who drank alcohol (15%). Females also had a significantly higher prevalence of hypertension (79.7%) and of being overweight and obese than men (47.3%) (Figure 3.3.3.1).

Figure 3.3.3.1 Presence of risk factors for hypertension among all participants with measured high blood pressure by sex, South Africa 2012[2]



1 DASH diet is an eating plan that is rich in fruits and vegetables and advocates for the use of low fat dairy products, reduced dietary cholesterol, saturated and total fats. This diet is high in calcium and potassium and advises the reduction of dietary sodium less than 100 mmol/day (2.4 g of sodium).

2 Not having one's blood pressure measured is a risk factor (American Hearth Association 2012).

Table 3.3.3.2 Prehypertension and hypertension among all participants 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	Prehypertensive blood pressure						Hypertensive blood pressure								
	Systolic blood pressure 120–139			Diastolic blood pressure 80–89			Systolic blood pressure ≥ 140 (mmHg)			Diastolic blood pressure ≥ 90 (mmHg)			Hypertension BP ≥ 140/90 mmHg		
	%	95% CI	n	%	95% CI	n	%	95% CI	N	%	95% CI	n	%	95% CI	n
Sex															
Male	43.9	[41.1–46.8]	2 474	19.3	[17.3–21.5]	2 474	25.4	[22.8–28.2]	2 474	11.7	[9.9–13.7]	2 474	10.2	[8.3–12.3]	2 475
Female	34.5	[32.6–36.4]	4 556	20.5	[18.9–22.1]	4 555	24.0	[22.2–26.0]	4 556	12.6	[11.1–14.1]	4 555	10.2	[9.0–11.6]	4 556
Age															
15–24	38.3	[35.2–41.5]	1 886	8.4	[6.8–10.3]	1 886	5.3	[4.2–6.7]	1 886	2.1	[1.4–3.2]	1 886	1.0	[0.6–1.7]	1 886
25–34	43.0	[38.8–47.2]	1 166	17.8	[15.2–20.8]	1 165	10.7	[7.6–14.7]	1 166	6.6	[4.7–9.4]	1 165	4.4	[2.8–6.9]	1 166
35–44	45.2	[40.8–49.6]	1 069	25.6	[22.1–29.3]	1 069	21.9	[18.4–25.9]	1 069	16.0	[12.9–19.7]	1 069	12.2	[9.3–16.0]	1 069
45–54	37.1	[33.4–41.0]	1 126	31.0	[27.2–35.0]	1 127	39.2	[35.5–43.0]	1 126	22.7	[19.5–26.2]	1 127	19.5	[16.7–22.6]	1 127
55–64	31.7	[28.2–35.6]	946	27.4	[23.2–31.9]	945	50.5	[45.5–55.5]	946	22.3	[18.4–26.6]	945	21.5	[17.7–25.8]	946
65+	24.3	[20.0–29.1]	829	23.8	[19.5–28.8]	829	63.7	[58.0–69.0]	829	19.6	[15.6–24.2]	829	18.9	[15.0–23.6]	829
Locality															
Urban formal	38.4	[35.5–41.5]	3 424	22.1	[20.1–24.3]	3 422	26.5	[23.5–29.7]	3 424	13.4	[11.3–15.8]	3 422	11.1	[9.2–13.4]	3 424
Urban informal	38.1	[33.8–42.6]	805	16.9	[13.4–21.0]	805	15.9	[12.8–19.7]	805	10.2	[7.8–13.1]	805	7.8	[5.7–10.6]	805
Rural formal	39.9	[36.3–43.6]	941	22.2	[18.6–26.3]	942	27.2	[23.5–31.2]	941	15.4	[12.0–19.6]	942	14.2	[10.7–18.4]	942
Rural informal	37.5	[34.8–40.4]	1 860	17.2	[15.4–19.2]	1 860	23.4	[20.8–26.2]	1 860	10.2	[8.5–12.1]	1 860	8.4	[7.0–10.2]	1 860
Province															
Western Cape	40.2	[36.3–44.2]	1 189	27.3	[23.4–31.6]	1 190	29.4	[24.8–34.4]	1 189	10.7	[8.4–13.4]	1 190	9.4	[7.3–12.1]	1 190
Eastern Cape	36.7	[32.5–41.2]	991	18.7	[15.7–22.2]	991	25.8	[21.4–30.7]	991	11.7	[9.6–14.2]	991	10.4	[8.3–13.0]	991
Northern Cape	38.8	[33.8–44.1]	453	19.0	[13.8–25.4]	453	22.2	[17.3–27.9]	453	12.1	[8.7–16.6]	453	10.8	[7.7–15.0]	453
Free State	46.1	[34.8–57.8]	382	23.4	[18.4–29.4]	382	28.4	[23.1–34.3]	382	19.4	[14.0–26.2]	382	17.3	[12.2–24.1]	382
KwaZulu-Natal	32.4	[28.9–36.0]	1 111	17.9	[15.4–20.7]	1 111	24.3	[20.7–28.2]	1 111	10.5	[7.8–14.0]	1 111	8.4	[6.1–11.6]	1 111
North West	36.8	[32.3–41.5]	679	18.6	[15.5–22.1]	679	28.2	[23.5–33.4]	679	14.7	[11.2–19.0]	679	13.0	[9.9–16.9]	679
Gauteng	40.0	[35.5–44.7]	795	21.8	[18.7–25.2]	794	23.9	[18.9–29.7]	795	14.8	[11.1–19.5]	794	11.4	[8.1–15.9]	795
Mpumalanga	36.5	[33.0–40.3]	828	16.5	[14.3–19.0]	828	19.7	[16.2–23.7]	828	10.3	[6.9–15.1]	828	9.1	[5.9–13.8]	828
Limpopo	41.7	[35.7–47.8]	602	14.5	[11.2–18.6]	601	19.0	[15.6–23.0]	602	8.3	[6.1–11.2]	601	6.6	[4.7–9.1]	602
Race															
African	38.2	[36.1–40.2]	4 826	18.8	[17.4–20.2]	4 825	23.4	[21.5–25.5]	4 826	12.1	[10.7–13.7]	4 825	9.9	[8.7–11.4]	4 826
White	41.6	[31.3–52.7]	134	26.7	[18.6–36.9]	133	28.5	[17.5–42.7]	134	13.0	[7.1–22.5]	133	12.2	[6.5–22.0]	134
Coloured	39.1	[35.7–42.6]	1 563	26.8	[24.0–29.9]	1 564	32.0	[28.8–35.5]	1 563	13.0	[10.8–15.5]	1 564	11.8	[9.7–14.1]	1 564
Asian/Indian	27.5	[16.9–41.5]	352	21.7	[16.5–28.1]	352	24.1	[19.1–29.9]	352	9.1	[6.3–13.0]	352	7.3	[4.8–10.9]	352
Total	38.2	[36.4–40.1]	7 030	20.0	[18.8–21.3]	7 029	24.6	[22.8–26.4]	7 030	12.2	[10.9–13.6]	7,029	10.2	[9.0–11.5]	7 031

95% CI: 95% confidence interval

Discussion

Despite the presence of highly effective and cost effective blood pressure lowering interventions, we still continue to see high levels of hypertension in South Africa. This has compounded the South African health landscape as a result of its health transitions which are characterised by an increase in NCDs that affect the causes of death.

Mean systolic blood pressure levels of 135.39 mmHg and above in people over 45 years of age are possibly an indication of a high prevalence systolic hypertension. These findings are consistent with other studies, though the mean systolic blood pressure has been found to range between 127 mmHg and 146 mmHg in adults over 45 years. (Phaswana-Mafuya, Peltzer et al. 2012; MRC DOH 2007). Mean diastolic blood pressures were generally within normal ranges and, similar to other studies, increased with age only up to midlife (MRC DOH 2007) (Phaswana-Mafuya, Peltzer et al. 2012). Mean blood pressure has decreased in most high income countries and conversely mean blood pressure has remained constant or increased in many African countries where historically the lowest blood pressure levels have been found (Erdine & Aran 2004; WHO 2010; WHO 2012).

The increase in the rate of prehypertensive blood pressures is cause for concern as these individuals may go on to develop hypertension, and prehypertension is correlated with other cardiovascular risk factors such as diabetes mellitus and obesity (Vasan, Larson et al. 2001; Zhang & Li 2011). Over a third of adults in the group 15–24 years of age had blood pressures in the prehypertensive range and this did not change significantly across the age groups. The rate of prehypertension in adults is comparable to that found in countries such as 45% in India, 31.6% in North Korea (North Korean Health and Nutrition Survey 2001); 31% among American adults and over 31.8% in Japan (Jichi Medical School Cohort Study) (Wang & May 2004; Zhang & Li 2011). Globally approximately one quarter of adults could be considered to be hypertensive (Kearney, Whelton et al. 2005; Pickering, Hall et al. 2005). Over 10% of deaths from coronary heart disease related to high blood pressure occur in individuals who are prehypertensive (Pickering, Hall et al. 2005).

Both females and males were found to have similar levels of high systolic and diastolic blood pressures. Other studies overall have shown that significant differences between rates of hypertension between men and women often are not present (Ostchega, Dillon et al. 2007), however females have been shown to experience higher cardiovascular disease related mortality than males (Bradshaw, Groenewald et al. 2003; Perk, De Backer et al. 2012). These findings are reflective of findings from other studies. Rising systolic blood pressures and falling diastolic blood pressures with age are consistent with findings from other studies (US Department of Health 2004). The risk of hypertension increases significantly with age for both males and females (Ardington & Case 2009). Systolic blood pressure rises with increasing age and is largely responsible for increasing incidence and prevalence of hypertension (US Department of Health 2004).

More than half of adults over 55 years of age had high systolic blood pressures. It has been reported that up to 50% of adults in some countries have raised blood pressures (WHO 2012) and in South Africa almost three quarters of adults over 50 were found to have high blood pressure (Phaswana-Mafuya, Peltzer et al. 2012) which is consistent with findings from the United States of America (Pickering, Hall et al. 2005).

The rates of hypertension have increased among both males and females over the past 15 years (Mayosi, Flisher, Calloo 2009). While the prevalence of hypertension has increased, levels of knowledge about their condition have not increased among hypertensive males and females; this significantly increases the risk of complications as those with hypertension are frequently undiagnosed and as a result untreated (Mayosi, Lawn, Van Niekerk et al. 2012). Rates of high blood pressure are paradoxically almost equal across informal areas (urban and rural), where the prevalence of high blood pressure tends to be lower, and across formal areas (urban and rural), where the prevalence of high blood pressure tends to be higher as opposed to generally higher rates in urban than rural areas (Erdine & Aran 2004; Ibrahim & Damasceno 2012).

Overweight and obesity were highly prevalent among those who had high blood pressures. Obesity and overweight are a growing epidemic around the world, particularly among women, and can exert significant financial strain on economies as a result of obesityrelated diseases (OECD 2012). In South Africa. the prevalence of obesity in women from different race groups has been found to range between 48.9% and 58.5% (Goedecke, Jennings et al. 2006).

Several studies have indicated that high BMI and high salt intake can account for most of the variation in the prevalence of hypertension (Lee & Cooper 2009) and this was also found in this study in the case of BMI. However, while studies (Charlton, Steyn, Levitt. 2007; Bertram, Steyn, Wentzel-Viljoen et al. 2012) showed that all South African races consume more than the recommended daily allowance of salt (sodium), the consumption of salty snacks did not appear to have been a common practice among the South African population with high blood pressure (< 5% of participants).

3.3.4 Clinical examination: measured cholesterol

Cholesterol is required by the body in the synthesis of hormones and also for bile production, which is necessary for the digestion of fats. However, excess dietary intake of animal products can lead to high blood levels of low density lipoprotein (LDL) thereby increasing an individual's risk of developing cardiovascular disease (CVD). There are two sources of blood cholesterol: endogenous production in the liver and dietary intake from animal products. Endogenous production is genetically determined and is constant. Dietary intake of cholesterol varies with the food choices of an individual and is therefore a modifiable risk factor in the development of cardiovascular disease. There are two types of cholesterol – high-density lipoprotein (HDL), the so-called good cholesterol, and LDL, the so-called bad cholesterol. LDL is responsible for the development of CVD, whereas HDL provides protection against this disease process. Low levels of HDL are in fact associated with an increased risk of developing CVD. It is, therefore, important to track this dietary risk factor in order to measure changes in blood levels of cholesterol over time and design appropriate interventions. Debates about the role of triglycerides in the atherogenic process over the years have been inconclusive. A statement from the American Heart Association concludes: 'This scientific statement reviews the pivotal role of triglycerides in lipid metabolism and reaffirms that triglyceride is not directly atherogenic but represents an important biomarker of CVD risk because of its association with atherogenic remnant particles and apo CIII' (Miller, Stone, Ballantyne et al. 2011), hence the inclusion of serum triglycerides among the lipid biomarkers in SANHANES-1.

Results

In this survey, the mean serum total-, HDL-, and LDL-cholesterol concentrations for males was, respectively, 4.21, 1.22 and 2.44 mmol/L. The mean serum triglycerides concentration was 1.44 mmol/L (Table 3.3.4.1). Serum total cholesterol, LDL–cholesterol and triglycerides progressively increased with age and peaked in the older age groups with an overall consistent decline in the group 65 years of age and older. Mean HDL-cholesterol remained over all constant with age.

Participants in the formal urban and formal rural areas had overall significantly higher serum total- and LDL cholesterol as well as triglycerides. Provincially, the Western Cape had the highest and significantly higher, serum total and LDL-cholesterol and the Northern Cape the highest triglyceride concentrations. By race, the black African group had the lowest, and significantly lower, mean concentrations in all the lipid parameters measured (Table 3.3.4.1). An overall very similar pattern was documented for female participants (Table 3.3.4.2)

At the national level, one out of five males 15–65 years of age and older had an abnormally high serum total- and LDL-cholesterol, and one out of two an abnormal HDL-cholesterol (Table 3.3.4.3). Participants residing in the formal urban or formal rural areas had the highest prevalence of such abnormal concentrations. At the provincial level, the highest recorded prevalence of abnormal serum total cholesterol concentrations was in the Western Cape (34.8%) and the lowest in Limpopo (10.9%). The black African race group had the lowest prevalence of abnormal serum total- and LDL-cholesterol but one out of two such participants (53.3%) had an abnormal HDL-cholesterol concentration. The pattern of abnormally elevated triglycerides was similar in extent to that of other lipids, with one out of four respondents having elevated serum triglyceride values.

In female participants at the national level, the prevalence of abnormal lipid concentrations was even higher with almost one out of three females 15–65 years of age and older having an abnormally high serum total- (28.1%) and LDL-cholesterol (34.7%), and one out of two (44.1%) an abnormal HDL-cholesterol (Table 3.3.4.4). Participants residing in the formal urban or formal rural areas had the highest prevalence of such abnormal concentrations. At the provincial level, the highest recorded prevalence of abnormal serum total cholesterol concentrations was in the Western Cape (39.3%) and the lowest in Limpopo (15.9%). The black African race group had the lowest prevalence of abnormal serum total- (24.9) and LDL-cholesterol (29.5%) but one out of two (45.4%) such participants had an abnormal HDL-cholesterol concentration. The pattern of abnormally elevated triglycerides was similar in extent to that of other lipids.

Discussion

While the other cardiovascular risk factors are more easily detected on routine examination, screening for dyslipidaemia and its subsequent management on diagnosis remains a South African dyslipidaemia consensus statement challenge within the South African health care system (Steyn, Fourie & Temple 2006).

Mean total serum cholesterol levels increased progressively with age. Females had significantly higher mean total serum and LDL-cholesterol levels. The overall mean for both males and females total cholesterol was lower than the age standardised rates reported by WHO in 2011 (4.64 mmol/L and 4.76 mmol/L for males and females respectively (WHO 2011). Overall the black African population had the lowest levels total serum (and LDL) cholesterol levels compared to the other race groups a finding that confirms those reported in a technical report in 2006 (Steyn, Fourie & Temple 2006). Mean total serum cholesterol levels in whites and Indians and among those in urban formal areas were comparable to lipid levels found in the North American population (Cohen et al. 2010) (200.3 mg/dl converted to 5.18 mmol/L) (Anonymous) and this is probably also indicative of generally higher socio-economic status.

Table 3.3.4.1: Mean lipid profiles among male participants by age, locality, province and race, South Africa 2012

Background characteristics	Serum Cholesterol mmol/L			HDL–Cholesterol mmol/L			LDL–Cholesterol mmol/L			Triglycerides mmol/L		
	Mean	95% CI	Sample	Mean	95% CI	Sample	Mean	95% CI	sample	Mean	95% CI	Sample
Age group												
15–24	3.58	[3.50–3.66]	580	1.21	[1.17–1.25]	576	2.00	[1.90–2.09]	353	0.97	[0.88–1.06]	579
25–34	4.10	[3.98–4.22]	294	1.19	[1.08–1.30]	293	2.28	[2.16–2.41]	187	1.36	[1.19–1.54]	291
35–44	4.33	[4.16–4.50]	264	1.22	[1.14–1.30]	262	2.47	[2.27–2.66]	167	1.56	[1.38–1.74]	264
45–54	4.84	[4.63–5.05]	297	1.24	[1.16–1.31]	296	2.76	[2.47–3.06]	194	1.88	[1.72–2.03]	295
55–64	4.57	[4.37–4.78]	272	1.24	[1.17–1.31]	270	2.83	[2.52–3.14]	170	1.78	[1.56–2.00]	272
65+	4.55	[4.37–4.74]	250	1.22	[1.14–1.30]	250	2.66	[2.46–2.86]	165	1.67	[1.50–1.85]	249
Total	4.21	[4.13–4.29]	1 957	1.22	[1.18–1.25]	1 947	2.44	[2.35–2.54]	1 236	1.44	[1.37–1.52]	1 950
Locality												
Urban formal	4.37	[4.24–4.49]	969	1.21	[1.16–1.26]	966	2.65	[2.49–2.81]	597	1.57	[1.46–1.67]	967
Urban informal	3.90	[3.67–4.14]	204	1.22	[1.12–1.31]	205	2.21	[2.05–2.37]	128	1.04	[0.95–1.14]	203
Rural formal	4.20	[4.05–4.34]	374	1.29	[1.22–1.37]	374	2.26	[2.14–2.38]	288	1.37	[1.22–1.51]	371
Rural informal	3.99	[3.86–4.12]	434	1.22	[1.16–1.27]	427	2.18	[2.06–2.31]	218	1.33	[1.20–1.46]	434
Total	4.21	[4.13–4.29]	1 981	1.22	[1.19–1.25]	1 972	2.44	[2.35–2.54]	1 231	1.44	[1.37–1.51]	1 975
Province												
Western Cape	4.68	[4.41–4.94]	364	1.31	[1.25–1.37]	364	2.75	[2.51–2.98]	364	1.55	[1.37–1.72]	363
Eastern Cape	4.17	[3.99–4.34]	326	1.26	[1.19–1.34]	326	2.30	[2.18–2.43]	317	1.28	[1.17–1.40]	326
Northern Cape	4.23	[3.89–4.58]	132	1.23	[1.11–1.34]	133	2.31	[2.03–2.60]	133	1.62	[1.20–2.03]	133
Free State	4.27	[4.04–4.50]	186	1.24	[1.18–1.31]	185	2.43	[2.22–2.63]	182	1.44	[1.24–1.64]	185
KwaZulu-Natal	4.12	[3.92–4.33]	268	1.11	[1.05–1.17]	263	*	*	*	1.40	[1.23–1.58]	267
North West	4.08	[3.88–4.29]	237	1.31	[1.22–1.39]	237	2.20	[2.08–2.33]	234	1.20	[1.09–1.32]	237
Gauteng	4.24	[4.07–4.41]	204	1.22	[1.13–1.31]	202	*	*	*	1.56	[1.40–1.72]	201
Mpumalanga	4.03	[3.72–4.34]	165	1.25	[1.18–1.32]	165	*	*	*	1.25	[1.12–1.38]	164
Limpopo	3.78	[3.54–4.03]	103	1.16	[1.07–1.25]	100	*	*	*	1.40	[1.12–1.67]	103
Total	4.21	[4.13–4.29]	1 985	1.22	[1.19–1.25]	1 975	2.44	[2.35–2.54]	1 233	1.44	[1.37–1.51]	1 979
Race												
African	4.09	[4.00–4.19]	1 330	1.21	[1.17–1.25]	1,322	2.28	[2.20–2.36]	720	1.37	[1.29–1.46]	1 325
White	*	*	*	*	*	*	*	*	*	*	*	58
Coloured	4.49	[4.28–4.71]	495	1.27	[1.22–1.33]	495	2.58	[2.37–2.80]	471	1.53	[1.35–1.70]	493
Asian/Indian	5.11	[4.84–5.37]	101	1.08	[1.03–1.14]	100	3.15	[2.30–4.00]	*	2.10	[1.65–2.55]	101
Total	4.21	[4.13–4.29]	1 984	1.22	[1.19–1.25]	1,974	2.44	[2.35–2.54]	1 232	1.44	[1.37–1.51]	1 977

95% CI: 95% confidence interval

** Too few observations to report reliably*

Table 3.3.4.2: Mean lipid profiles among female participants by age, locality, province and race, South Africa 2012

Background characteristics	Serum cholesterol mmol/L			HDL–Cholesterol mmol/L			LDL–Cholesterol mmol/L			Triglycerides mmol/L		
Age group	Mean	95% CI	Sample	Mean	95% CI	Sample	Mean	95% CI	Sample	Mean	95% CI	Sample
15–24	3.95	[3.87–4.04]	881	1.28	[1.24–1.33]	878	2.30	[2.23–2.38]	524	0.83	[0.79–0.87]	875
25–34	4.20	[4.09–4.32]	586	1.22	[1.18–1.27]	584	2.54	[2.43–2.66]	350	1.10	[1.03–1.18]	583
35–44	4.46	[4.29–4.63]	519	1.28	[1.21–1.36]	518	2.60	[2.49–2.71]	326	1.14	[1.06–1.22]	513
45–54	4.88	[4.76–5.00]	587	1.27	[1.22–1.32]	585	3.05	[2.93–3.17]	374	1.57	[1.47–1.66]	585
55–64	5.07	[4.92–5.22]	435	1.30	[1.24–1.36]	435	3.08	[2.88–3.27]	272	1.64	[1.52–1.76]	433
65+	5.17	[5.02–5.32]	441	1.32	[1.26–1.39]	437	3.18	[3.02–3.35]	301	1.70	[1.58–1.82]	438
Total	4.53	[4.47–4.60]	3 449	1.28	[1.25–1.30]	3 437	2.76	[2.70–2.83]	2 147	1.26	[1.22–1.31]	3 427
Locality												
Urban formal	4.69	[4.60–4.78]	1 711	1.32	[1.28–1.35]	1 708	2.90	[2.80–3.01]	1 098	1.30	[1.24–1.37]	1 696
Urban informal	4.21	[4.10–4.31]	411	1.24	[1.19–1.29]	411	2.56	[2.47–2.66]	227	1.11	[1.01–1.22]	408
Rural formal	4.49	[4.36–4.61]	558	1.30	[1.24–1.36]	558	2.63	[2.51–2.75]	426	1.26	[1.18–1.35]	557
Rural informal	4.38	[4.27–4.50]	825	1.21	[1.17–1.25]	816	2.63	[2.53–2.74]	388	1.25	[1.18–1.32]	822
Total	4.53	[4.47–4.59]	3 505	1.28	[1.25–1.30]	3 493	2.76	[2.70–2.83]	2 139	1.26	[1.22–1.31]	3 483
Province												
Western Cape	4.84	[4.67–5.01]	632	1.33	[1.28–1.38]	631	2.96	[2.82–3.10]	630	1.31	[1.22–1.40]	624
Eastern Cape	4.55	[4.42–4.69]	531	1.23	[1.18–1.28]	528	2.65	[2.53–2.76]	516	1.35	[1.24–1.46]	528
Northern Cape	4.66	[4.38–4.94]	234	1.32	[1.25–1.38]	234	2.71	[2.47–2.94]	232	1.48	[1.29–1.66]	234
Free State	4.52	[4.39–4.65]	279	1.32	[1.25–1.38]	279	2.67	[2.57–2.78]	274	1.23	[1.15–1.30]	278
KwaZulu-Natal	4.47	[4.30–4.63]	452	1.13	[1.08–1.17]	450	*	*	*	1.33	[1.21–1.46]	447
North West	4.75	[4.54–4.96]	472	1.37	[1.30–1.44]	472	2.73	[2.59–2.87]	468	1.34	[1.20–1.47]	472
Gauteng	4.52	[4.40–4.63]	362	1.36	[1.31–1.42]	361	*	*	*	1.21	[1.11–1.31]	359
Mpumalanga	4.32	[4.17–4.47]	310	1.28	[1.21–1.35]	310	*	*	*	1.16	[1.04–1.27]	310
Limpopo	4.16	[3.99–4.33]	222	1.21	[1.16–1.27]	217	*	*	*	1.10	[0.94–1.26]	220
Total	4.53	[4.47–4.59]	3 494	1.28	[1.25–1.30]	3 482	2.76	[2.70–2.83]	2 127	1.26	[1.22–1.31]	3 472
Race												
African	4.43	[4.36–4.49]	2 408	1.26	[1.24–1.29]	2 398	2.64	[2.58–2.71]	1,287	1.21	[1.17–1.26]	2 394
White	*	*	*	*	*	*	*	*	*	*	*	55
Coloured	4.91	[4.78–5.04]	874	1.33	[1.29–1.37]	873	3.02	[2.89–3.15]	811	1.37	[1.29–1.46]	866
Asian/Indian	5.08	[4.81–5.35]	174	1.20	[1.11–1.29]	173	2.75	[1.78–3.71]	11	1.96	[1.61–2.31]	174
Total	4.53	[4.47–4.59]	3 511	1.28	[1.25–1.30]	3 499	2.76	[2.70–2.83]	2 145	1.27	[1.22–1.31]	3 489

95% CI: 95% confidence interval

** Too few observations to report reliably*

Table 3.3.4.3: Percentage among male participants with abnormal lipid profiles by age, locality, province and race, South Africa 2012

Background Characteristics	Abnormal serum cholesterol > 5 mmol/L			Abnormal HDL–cholesterol < 1.2 mmol/L			Abnormal LDL–cholestrerol > 3 mmol/L			Abnormal triglycerides > 1.7 mmol/L		
	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n
Age group												
15–24	2.9	[1.6–5.2]	577	47.6	[41.0–54.2]	573	3.8	[2.0–7.1]	353	7.9	[5.1–12.1]	576
25–34	8.9	[5.6–13.9]	292	59.6	[44.9–72.9]	292	15.7	[10.2–23.3]	187	28.5	[13.4–50.9]	290
35–44	23.6	[17.2–31.6]	263	55.8	[45.0–66.1]	261	23.2	[16.0–32.3]	166	32.5	[25.5–40.5]	263
45–54	36.7	[27.8–46.6]	294	55.9	[46.6–64.8]	293	28.9	[19.3–41.0]	191	51.8	[42.7–60.8]	292
55–64	30.3	[23.1–38.5]	269	48.0	[38.5–57.6]	267	35.1	[24.8–47.0]	168	37.3	[29.3–46.1]	269
65+	34.1	[25.9–43.5]	246	54.5	[44.7–63.9]	246	36.1	[25.9–47.7]	163	35.1	[27.6–43.4]	246
Total	19.2	[16.6–22.2]	1 941	52.8	[48.3–57.2]	1 932	21.4	[17.6–25.7]	1 228	28.5	[24.1–33.4]	1 936
Locality												
Urban formal	21.2	[17.2–25.9]	966	52.8	[46.1–59.4]	963	28.3	[21.9–35.6]	595	34.8	[27.9–42.5]	965
Urban informal	13.1	[8.2–20.4]	204	50.1	[37.6–62.6]	205	11.6	[6.8–19.0]	128	14.2	[9.6–20.4]	203
Rural formal	19.5	[15.2–24.7]	372	43.2	[32.3–54.8]	372	15.4	[10.2–22.5]	287	21.4	[16.4–27.5]	369
Rural informal	15.7	[11.6–21.0]	433	56.1	[49.6–62.4]	426	13.2	[8.6–19.9]	218	22.1	[17.8–27.0]	433
Total	18.9	[16.3–21.8]	1 975	52.5	[48.1–56.9]	1 966	21.4	[17.6–25.7]	1 228	28.3	[24.1–33.0]	1 970
Province												
Western Cape	34.8	[26.2–44.4]	363	49.1	[42.8–55.5]	363	32.1	[22.9–42.9]	363	35.5	[28.4–43.3]	362
Eastern Cape	20.8	[14.7–28.6]	323	49.4	[41.0–57.8]	323	16.3	[11.6–22.4]	315	20.5	[15.4–26.9]	323
Northern Cape	15.4	[7.3–29.6]	131	53.0	[26.4–78.0]	132	9.1	[4.4–17.7]	132	43.7	[20.0–70.6]	132
Free State	20.3	[13.1–29.9]	186	44.5	[36.9–52.3]	185	23.9	[15.9–34.3]	182	22.5	[16.3–30.3]	185
KwaZulu-Natal	18.7	[12.4–27.2]	267	62.4	[53.8–70.3]	262	*		*	27.5	[20.7–35.6]	266
North West	17.5	[11.3–26.2]	236	46.7	[36.3–57.4]	236	14.1	[9.2–20.9]	233	17.8	[12.6–24.6]	236
Gauteng	14.7	[10.5–20.2]	201	50.9	[38.8–62.9]	200	*		*	34.6	[23.1–48.3]	199
Mpumalanga	14.6	[8.2–24.7]	165	44.3	[35.3–53.7]	165	*		*	18.8	[13.1–26.4]	164
Limpopo	10.9	[5.7–19.7]	103	62.6	[50.9–73.0]	100	*		*	21.7	[14.2–31.6]	103
Total	18.9	[16.3–21.8]	1 975	52.5	[48.1–56.9]	1 966	21.4	[17.6–25.7]	1 228	28.3	[24.1–33.0]	1 970
Race												
African	15.3	[12.7–18.4]	1 318	53.3	[48.1–58.4]	1 311	15.0	[11.6–19.0]	716	25.1	[20.2–30.8]	1 314
White	*	*	*	*	*	*	*	*	*	*	*	58
Coloured	27.2	[20.7–34.9]	491	49.8	[41.1–58.5]	491	24.8	[17.9–33.4]	467	35.2	[26.4–45.2]	490
Asian/Indian	41.2	[30.5–52.9]	101	58.8	[44.8–71.5]	*	*	*	*	45.5	[31.5–60.3]	101
Total	18.9	[16.3–21.8]	1 968	52.6	[48.2–57.0]	1 959	21.3	[17.5–25.6]	1 224	28.3	[24.1–33.0]	1 963

95% CI: 95% confidence interval

** Too few observations to report reliably*

Table 3.3.4.4: Percentage of female participants with abnormal lipid profiles by age, locality, province and race, South Africa 2012

Background characteristics	Abnormal serum cholesterol > 5 mol/L			Abnormal HDL-cholesterol < 1.2 mmol/L			Abnormal LDL-cholesterol > 3 mmol/L			Abnormal triglycerides > 1.7 mmol/L		
	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n
Age group												
15–24	9.3	[6.6–13.0]	871	44.3	[38.4–50.4]	868	15.2	[11.9–19.1]	516	4.3	[3.0–6.2]	865
25–34	18.0	[14.6–22.0]	582	49.6	[44.2–55.1]	580	21.7	[16.8–27.7]	347	17.0	[13.0–21.9]	579
35–44	22.2	[16.7–28.9]	515	46.7	[37.2–56.4]	514	25.3	[19.7–31.8]	322	14.4	[10.1–20.2]	509
45–54	38.2	[32.9–43.9]	582	43.8	[36.5–51.4]	580	48.0	[42.1–54.0]	370	32.3	[26.3–38.8]	580
55–64	50.3	[42.6–57.9]	429	38.0	[31.2–45.3]	429	53.4	[41.7–64.7]	266	36.2	[27.9–45.6]	427
65+	50.3	[44.3–56.4]	437	39.0	[32.7–45.8]	433	50.7	[43.5–57.9]	298	39.2	[33.6–45.2]	434
Total	28.3	[25.8–30.9]	3 416	43.9	[40.8–47.1]	3 404	34.7	[31.5–38.0]	2 119	21.3	[19.1–23.7]	3 394
Locality												
Urban formal	33.5	[29.8–37.3]	1 694	39.3	[34.6–44.2]	1,691	39.6	[35.1–44.4]	1,083	22.5	[19.0–26.4]	1 679
Urban informal	16.5	[12.4–21.6]	410	47.7	[41.5–53.9]	410	26.3	[20.6–33.0]	226	13.7	[9.5–19.3]	407
Rural formal	27.7	[23.6–32.2]	558	41.3	[34.6–48.4]	558	27.9	[23.1–33.4]	426	22.3	[18.8–26.2]	557
Rural informal	23.4	[19.2–28.2]	821	51.3	[46.7–55.9]	812	30.9	[23.8–39.1]	384	21.6	[17.7–26.2]	818
Total	28.1	[25.7–30.6]	3 483	44.1	[41.1–47.1]	3 471	34.7	[31.5–38.0]	2 119	21.3	[19.1–23.8]	3 461
Province												
Western Cape	39.3	[32.5–46.5]	632	38.8	[32.9–45.0]	631	43.6	[37.5–49.9]	630	20.5	[16.8–24.7]	624
Eastern Cape	30.8	[25.9–36.3]	527	51.2	[45.4–57.0]	524	28.9	[24.5–33.7]	512	24.9	[19.6–31.0]	524
Northern Cape	32.4	[24.1–41.9]	234	44.2	[36.0–52.7]	234	35.0	[26.5–44.5]	232	31.4	[23.1–41.0]	234
Free State	29.0	[23.4–35.4]	277	47.3	[40.6–54.0]	277	28.3	[22.3–35.2]	272	17.0	[13.0–21.9]	276
KwaZulu-Natal	22.9	[18.3–28.3]	451	55.9	[49.9–61.6]	449	*	*	*	25.4	[19.6–32.2]	446
North West	38.2	[29.3–47.9]	470	39.3	[31.4–47.7]	470	35.1	[26.0–45.5]	466	27.0	[17.1–39.8]	470
Gauteng	27.1	[21.7–33.3]	361	35.6	[27.6–44.4]	360	*	*	*	19.6	[14.1–26.4]	358
Mpumalanga	22.9	[18.6–27.8]	310	34.4	[25.6–44.4]	310	*	*	*	14.9	[11.8–18.5]	310
Limpopo	15.9	[10.6–23.1]	221	48.0	[40.0–56.1]	216	*	*	*	15.1	[10.2–21.7]	219
Total	28.1	[25.7–30.6]	3 483	44.1	[41.1–47.1]	3 471	34.7	[31.5–38.0]	2 119	21.3	[19.1–23.8]	3 461
Race												
African	24.9	[22.4–27.6]	2 381	45.4	[41.9–49.0]	2 371	29.5	[25.8–33.5]	1 265	19.4	[16.9–22.2]	2 367
White*	*	*	*	*	*	*	*	*	*	*	*	55
Coloured	40.6	[35.5–45.9]	868	40.1	[35.1–45.3]	867	44.3	[38.8–49.9]	805	24.5	[21.3–28.1]	860
Asian/Indian	45.3	[33.7–57.5]	174	47.6	[34.0–61.5]	173	*	*	*	45.9	[32.7–59.8]	174
Total	28.1	[25.8–30.6]	3 478	44.1	[41.1–47.2]	3 466	34.6	[31.4–37.9]	2 117	21.4	[19.1–23.9]	3 456

95% CI: 95% confidence interval

** Too few observations to report reliably*

The management of high cholesterol is challenging, despite the existence of guidelines, as it involves medical treatment and lifestyle modification and cost effectiveness of care is an important consideration at both clinical and policy levels (Steyn, Fourie & Temple 2006; Klug 2012) . The HIV epidemic in South Africa has also had profound effects on health and health care and some antiretroviral agents have been shown to cause and exacerbate abnormal lipid metabolism (Calza, Manfredi & Chiodo 2004; Koutkia & Grinspoon 2004). Translating the dyslipidaemia guidelines into practice in terms of screening and care despite its challenges, is an important aspect of the effective management of lipid related risk factors and in addressing NCDs, particularly as societies become more affluent (WHO 2011).

3.3.5 Clinical examination: Measured blood sugar

In 2008, it was estimated that 347 million people worldwide had diabetes, which was an increase from the estimated 153 million people in 1980. The 2008 diabetes prevalence rate among adults 25 years of age and older was 9.8% and 9.2% for males and females respectively whereas in 1980 the prevalence rate was 8.3% in males and 7.5% in females (Danaei, Finucane, Lu et al. 2011). High blood glucose was established as the third highest risk factor for mortality in 2004 with 6% of deaths been attributed to the condition and 83% of those deaths being in low and middle income countries. Furthermore, high blood glucose was the cause of all diabetes deaths, 22% of ischaemic heart disease and 16% of stroke deaths in 2004 (WHO 2009).

Diabetes is a disease condition that occurs when the pancreas does not produce enough insulin, or when the body cannot effectively use the insulin it produces (WHO 2013). This leads to an increased concentration of glucose in the blood or hyperglycaemia. Type 1 diabetes is characterised by a lack of insulin production. Type 2 diabetes is caused by the body's ineffective use of insulin which often results from excess body weight and physical inactivity. Globally, as a result of population growth and ageing, the absolute number of people with diabetes has increased and so has its prevalence (Danaei, Funicane, Lu et al. 2011).

Diabetes is routinely diagnosed by testing an individual's blood for glucose (sugar) after an overnight fast or after performing a glucose tolerance test under the same conditions. Glycated haemoglobin (HbA1c) is the current gold standard test to monitor long-term blood sugar control in people already diagnosed with diabetes. HbA1c has recently been proposed by WHO as another test to detect diabetes in undiagnosed people (WHO 2011).

WHO recommends that 'an HbA1c of 6.5% is the cut point for diagnosing diabetes. A value of less than 6.5% does not exclude diabetes diagnosed using glucose tests'. With regard to the later part of the recommendation, the use of a lower cut off of 6.1% has been recommended as being appropriate in the screening and diagnosis of diabetes. The latter has been reported to be optimal in the screening and diagnosis of diabetes among coloured South Africans because secondary organ dysfunction can occur at or below the recommended diagnostic screening cut-off of 6.5% (Zemlin, Matsha, Hassan et al. 2011).

Results

At the national level, the mean HbA1c of combined male and female respondents was 5.9%, no significant differences in sex were observed. Mean HbA1c increased significantly with age reaching its highest value (6.4%) in the group 55–64 years of age (Table 3.3.5.1). Urban informal residents had the lowest HbA1c value (5.6%). The four provinces with

Table 3.3.5.1: Mean HbA1c and percentage of concentrations among all participants aged 15 years and older with elevated HbA1c levels by sex, age, locality, province and race, South Africa 2012

Background characteristics	Mean HbA1c (%)		HbA1c < 6.1%		HbA1c > 6.1% and < 6.5%		HbA1c > 6.5%		Sample
	mean	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex									
Male	5.8	[5.7–5.9]	84.4	[81.4–87.1]	7.7	[6.1–9.6]	7.9	[5.7–10.7]	1 730
Female	5.9	[5.8–6.0]	79.0	[76.2–81.5]	10.0	[8.6–11.6]	11.0	[9.1–13.2]	3 010
Total	**5.9**	**[5.8–5.9]**	**81.5**	**[79.4–83.5]**	**8.9**	**[7.8–10.2]**	**9.5**	**[8.1–11.2]**	**4 740**
Age group									
15–24	5.5	[5.4–5.5]	95.9	[94.1–97.2]	3.8	[2.5–5.6]	0.3	[0.1–1.0]	1 233
25–34	5.5	[5.5–5.6]	93.7	[90.9–95.7]	3.8	[2.4–6.0]	2.5	[1.4–4.4]	768
35–44	5.7	[5.7–5.8]	86.6	[83.1–89.5]	9.0	[6.6–12.3]	4.3	[2.9–6.4]	690
45–54	6.3	[6.1–6.5]	72.0	[65.5–77.8]	11.2	[8.6–14.6]	16.7	[11.2–24.1]	758
55–64	6.4	[6.2–6.6]	61.7	[55.1–68.0]	13.9	[10.6–18.0]	24.4	[18.6–31.2]	600
65+	6.3	[6.1–6.4]	61.1	[55.4–66.5]	19.9	[15.6–25.0]	19.0	[15.7–22.8]	617
Total	**5.9**	**[5.8–5.9]**	**81.3**	**[79.2–83.3]**	**9.1**	**[8.0–10.4]**	**9.6**	**[8.1–11.3]**	**4 666**
Locality									
Urban formal	5.9	[5.9–6.0]	80.2	[77.3–82.8]	8.5	[7.1–10.2]	11.3	[9.2–13.8]	2 442
Urban informal	5.6	[5.6–5.7]	90.0	[86.4–92.7]	5.4	[3.6–8.0]	4.6	[3.0–6.9]	580
Rural formal	5.8	[5.7–5.9]	87.5	[82.0–91.5]	7.8	[5.2–11.6]	4.7	[2.8–7.9]	807
Rural informal	5.9	[5.8–6.0]	79.0	[74.4–82.9]	11.9	[9.4–14.9]	9.2	[6.2–13.3]	921
Total	**5.9**	**[5.8–5.9]**	**81.5**	**[79.5–83.5]**	**8.9**	**[7.8–10.2]**	**9.5**	**[8.0–11.2]**	**4 750**

Province									
Western Cape	6.0	[5.9–6.1]	78.8	[74.0–82.9]	10.0	[7.9–12.6]	11.2	[8.3–15.0]	977
Eastern Cape	6.0	[5.9–6.1]	79.9	[75.7–83.6]	11.5	[8.9–14.8]	8.5	[6.1–11.8]	806
Northern Cape	6.1	[5.9–6.3]	66.4	[46.3–82.0]	11.9	[7.3–18.7]	21.7	[7.7–48.0]	333
Free State	5.9	[5.8–6.0]	78.5	[74.3–82.2]	11.4	[8.9–14.6]	10.1	[7.1–14.1]	438
KwaZulu-Natal	5.9	[5.7–6.0]	83.5	[77.6–88.1]	6.5	[4.3–9.8]	10.0	[6.6–14.7]	487
North West	6.0	[5.8–6.1]	71.7	[63.3–78.7]	15.8	[11.7–20.9]	12.5	[6.7–22.2]	681
Gauteng	5.8	[5.7–5.9]	86.3	[81.7–89.8]	5.8	[3.7–9.1]	7.9	[5.4–11.4]	529
Mpumalanga	5.6	[5.5–5.8]	86.8	[77.3–92.7]	7.6	[4.3–13.0]	5.6	[2.9–10.6]	337
Limpopo	5.6	[5.3–5.9]	90.0	[81.3–94.9]	5.4	[2.2–12.7]	4.6	[1.4–13.8]	162
Total	**5.9**	**[5.8–5.9]**	**81.5**	**[79.5–83.5]**	**8.9**	**[7.8–10.2]**	**9.5**	**[8.0–11.2]**	**4 750**
Race									
African	5.8	[5.8–5.9]	83.1	[80.8–85.2]	8.7	[7.4–10.2]	8.2	[6.7–10.0]	3 108
White	5.7	[5.6–5.9]	87.9	[77.8–93.7]	4.0	[1.6–9.7]	8.1	[4.0–15.9]	104
Coloured	6.0	[5.9–6.2]	75.4	[69.4–80.6]	11.2	[9.3–13.5]	13.4	[8.8–19.9]	1 294
Asian/Indian	6.5	[6.2–6.7]	58.2	[47.9–67.8]	11.1	[6.0–19.7]	30.7	[20.6–43.1]	234
Total	**5.9**	**[5.8–5.9]**	**81.5**	**[79.4–83.5]**	**8.9**	**[7.8–10.2]**	**9.5**	**[8.1–11.2]**	**4 740**

95% CI: 95% confidence interval

overall significantly higher values of 6% or greater were Western Cape, Eastern Cape, Northern Cape and North West. The two race groups with significantly higher HbA1c values were the coloured (6%) and Asian/Indian (6.5%) race groups. Almost one out of five participants (18.4%) had impaired glucose homeostasis (HbA1c > 6.1%). Diabetes (HbA1c > 6.5%) was diagnosed in 9.5%, and diabetes should be excluded (HbA1c > 6.1 and < 6.5%) in 8.9% of the participants. The prevalence of impaired glucose homeostasis (HbA1c > 6.1 and < 6.5%) and diabetes (HbA1c > 6.5%) increased with age, reached a peak in the groups 45–54 and 55–64 years of age and was the highest among rural informal (11.9%) and urban formal (11.3%) residents. The prevalence of impaired glucose homeostasis and diabetes was in excess of 10% (range 10–21.7%) in five of the nine provinces. The coloured (11.2 and 13.4%) and Asian/Indian (11.1 and 30.7%) race groups had the highest prevalence of impaired glucose homeostasis and diabetes, respectively.

Among male respondents, the mean HBA1c was significantly higher in the age groups older than the group 15–34 years of age, with 8% and 7.9% prevalence of impaired glucose homeostasis (HBA1c > 6.1 and < 6.5%) and diabetes (HBA1c > 6.5%) at the national level. The increase in the mean HBA1c values was associated with a significantly higher age related prevalence of impaired glucose homeostasis (HBA1c > 6.1 and < 6.5%) and diabetes (HBA1c > 6.5%), with the highest prevalence in the groups 65 years of age and older and 55–64 years of age (19.7 and 20.9% respectively). By locality, the respective significantly higher prevalence was seen in the rural informal (13.7%) and urban formal (10.6%) settings. The prevalence among the provinces was similar to the national picture with four and three of the nine provinces having respectively a prevalence ranging from 9.5–14.6% for impaired homeostatsis and 9.7–25.6% for diabetes. The coloured and Asian/Indian race groups had the highest prevalence for impaired glucose homeostasis 8.8 and 13.9%, and diabetes 15.6 and 21% respectively. The prevalence, in pattern, was very similar in females but its extent was significantly higher (data not shown).

Discussion

In 2008, it was estimated that 347 million people worldwide have diabetes and that the diabetes prevalence rate among adults 25 years of age and older was 9.8% and 9.2% for males and females respectively (Danaei, Funicane, Lu 2011). Although epidemiological studies have been conducted in selected communities and population groups throughout South Africa, national level diabetes prevalence has been mainly informed by self-reporting. The first South Africa demographic and health survey, which was conducted in 1998, established that for people 15 years of age and above the reported prevalence was 2.4% for males and 3.7% for females (Steyn, Fourie & Temple 2006). In the 2003 South Africa demographic and health survey, the reported diabetes prevalence was 2.6% for males and 3.9% for females (DOH 2007). Reported diabetes prevalence from the 2008 National Income Dynamics Study (NIDS) was higher among people who had a body mass index of more than 30 compared to those with a body mass index of less than 30. Among people with a body mass index of less than 30, the reported diabetes prevalence was 1.7% for males and 2.4% for females (Ardington & Case 2009). In 2000, the estimated prevalence of diabetes among South African adults 30 years of age and older was 5.5% (Bradshaw, Norman, Pieterse et al. 2007).

Diabetes prevalence also varied with age and sex. For both males and females, the prevalence increased with age although among adults 60 years and older, the prevalence was significantly higher in females. For the younger age groups, the prevalence did not differ significantly among males and females. Indians were the race group with the highest diabetes prevalence. Over 20 000 deaths were attributed to diabetes in 2000 which accounted for 4.3% of all deaths; this placed diabetes as the seventh commonest cause of death in South Africa. In 2010, three per cent of deaths were associated with diabetes (WHO 2011).

There is a paucity of epidemiological national studies in South Africa that measure diabetes prevalence using biomarkers. Overall analysis of the data on HbA1c levels according to sex, race, age and locality highlight some of the findings from the previous studies such as the higher prevalence among females, Indians, urban localities and older age groups. The use of HbA1c as a biomarker for confirming a diabetes diagnosis needs to be interpreted with caution. It is acknowledged, however, that a HbA1c value of 6.1% or higher correlates with a higher risk of developing diabetes (Elderman, Maren, Tara et al. 2011). Furthermore, the high HIV prevalence rate among South Africans may contribute to error in the interpretation of HbA1c levels since it is established that HbA1c cannot be used to diagnose diabetes in individuals with HIV.

3.4 Adult health risk profiles

In this section, various adult health risk factors are presented.

3.4.1 Tobacco use

Tobacco use is the leading cause of premature mortality globally (WHO 2009a). It is estimated that tobacco kills almost six million people a year. If current trends continue, by 2030 tobacco will kill more than eight million people each year, with 80% of these deaths occurring in low and middle income countries (WHO 2011). Globally, tobacco smoking causes about 71% of lung cancer, 42% of chronic respiratory disease and nearly 10% of cardiovascular disease (WHO 2009a). The US Centers for Disease Control (CDC) maintains that compared to non-smokers, smoking increases the risk of coronary heart disease by 2 to 4 times, stroke by 2 to 4 times, developing lung cancer for males by 23 times, developing lung cancer for females by 13 times, and dying from chronic obstructive lung diseases (such as chronic bronchitis and emphysema) by 12 to 13 times (CDC 2012).

Second-hand tobacco smoke is estimated to kill 600 000 people worldwide each year (WHO 2011). While the prevalence of smoking is considerably higher in men than in women, second-hand smoke disproportionately harms women. Worldwide, of the deaths attributable to second hand smoke, 47% occurred in women, 28% in children and 26% in men (Öberg et al. 2011).

Tobacco use is most often initiated and established during adolescence and young adulthood. Nearly 9 out of 10 smokers start by the age of 18 and 99% start by age 26 (CDC 2012). Although progress has been made in reducing tobacco use among youth, large numbers of young people are still using tobacco. The Global Youth Tobacco Survey, conducted in South Africa in 2011 was the fourth nationally representative study on tobacco use among grades 8–10 high school learners. It showed that significantly more boys (21.7%) reported being current cigarette smokers than girls (12.1%). Between the ages of 13 and 16 and older, the prevalence of current smoking increased with age (Reddy 2013).

To study the smoking behaviours of the South African population, questions were asked pertaining to the history of ever having smoked tobacco, the current use of other tobacco products, the frequency and duration of use, with respect to the history or current use of tobacco, the age of initiating tobacco or other tobacco product use, and attempts to cease the use of tobacco or other tobacco products. Other tobacco products were defined as hand-rolled cigarettes, pipes, cigars, cheroots and cigarillos, hookah, hubbly bubbly, a water pipe session, electronic cigarettes, snuff, chewing tobacco, and smokeless tobacco.

The data on the history and current use of tobacco were cross-tabulated by sex, age, locality, province, and race of the respondent.

Results

Key findings on tobacco use are presented in this section.

3.4.1.1 Prevalence of tobacco using behaviour

This section describes findings on tobacco using behaviour.

Prevalence of ever smoking tobacco
Overall, 20.8% of the population has a reported history of ever having smoked tobacco and 79.2% have never smoked tobacco.

'Ever smokers' are comprised of those who are daily smokers (16.2%), ex-smokers (2.6%), and fewer than daily smokers (2%).

Prevalence of ever using other tobacco products
Overall, 6.7% of the population reported having ever used other tobacco products and 93.3% having never used other tobacco products.

Figure 3.4.1.1.1 Prevalence of ever smoking tobacco, South Africa 2012

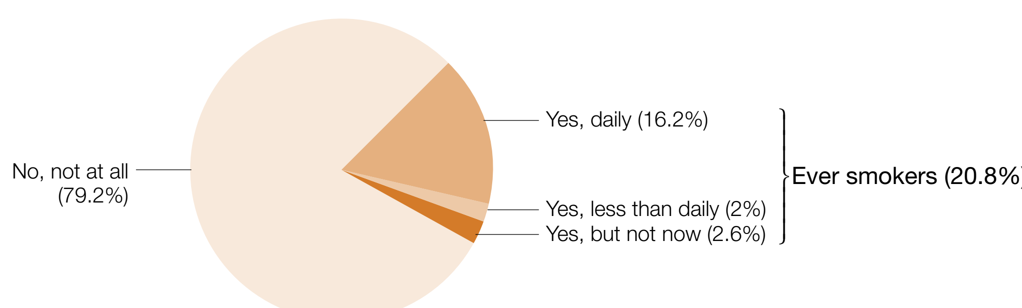
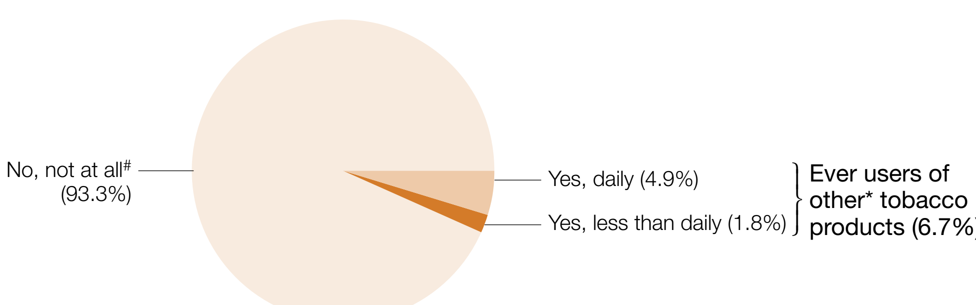


Figure 3.4.1.1.2 Prevalence of usage of other tobacco products, South Africa 2012



** Other tobacco products include hand-rolled cigarettes, pipes, cigars, cheroots and cigarillos, hookah, hubbly bubbly, water pipe sessions, electronic cigarettes, snuff, chewing tobacco and smokeless tobacco.*

 # The participants who answered 'No, not at all' to the question 'Do you currently smoke tobacco or use tobacco products?' were defined as never-smokers.

'Ever users of other tobacco products' comprised of those who are daily users (4.9%) and fewer than daily users (1.8%).

The prevalence of having ever smoking tobacco by sex, age, locality, province, and race is shown in Table 3.4.1.1.1. Males reported an having ever smoking tobacco rate of 32.8%, which is more than three times more than the female rate of 10.1%. The prevalence of having ever smoked tobacco increases with age up to the group 55–64 years of age, then decreases after age 65.

Individuals from rural formal localities reported the highest rate of having ever smoked tobacco (24.5%); however, this was not significantly different from the national rate (20.8%).

Western Cape residents reported the highest provincial rate of having ever smoked tobacco (38.5%), which is significantly higher than the national prevalence (20.8%). Limpopo residents reported lowest rates of having ever smoking (14.4%), which is significantly lower than the national average (20.8%).

Coloured individuals reported the highest rate of having ever smoking (44.9%), which is significantly higher than the national average.

The prevalence of males who reported having ever used other tobacco products (8.8%) was significantly higher than for females (4.8%). The prevalence of having ever used other tobacco products by age showed no significant difference between the different age groups and the national average (6.7%).

Free State residents reported the highest provincial rate of having ever used other tobacco products (21.6%), which is significantly higher than the national average. North West residents reported the lowest rate of individuals who had ever used other tobacco products (3.2%), which was significantly lower than the national average.

Significantly more coloured individuals (9.8%) reported having ever used other tobacco products than black African (6.6%) and Indian (3.4%) individuals.

The prevalence of having ever smoked tobacco and having ever used other tobacco products by age group, province, locality and race are presented for males (Table 3.4.1.1.2) and females (Table 3.4.1.1.3).

For males, the national prevalence of having ever smoked tobacco was 32.8%, which increased with age from group 15–24 years of age to the group 45–54 years of age. Males 15–24 years of age (19.7%) had a significantly lower prevalence of having ever smoked tobacco than the national average (32.8%) or than those in all the other age groups.

There was no significant variation in the prevalence of males who reported having ever smoked tobacco by locality. The Western Cape (46.0%) and Free State (50.4%) reported significantly higher rates of males who had ever smoked tobacco than the national average of (32.8%), while the North West (25.2%) and Gauteng (24.6%) reported significantly lower rates than the national average.

Coloured males (50.8%) reported significantly higher rates of having ever smoked tobacco than African (31.4%) and white (25.5%) males.

Table 3.4.1.1.1: Prevalence of having ever smoked tobacco and having ever used other tobacco products among all participants by sex, age, locality, province and race, South Africa 2012

Background characteristics	Have ever smoked tobacco					Ever used other tobacco product*				
	Have ever smoked		Have never smoked		Total	Have ever used		Have never used#		Total
	%	95% CI	%	95% CI	n	%	95% CI	%	95% CI	n
Sex										
Male	32.8	[30.5–35.2]	67.2	[64.8–69.5]	6 371	8.8	[7.8–10.0]	91.2	[90.0–92.2]	6 185
Female	10.1	[8.8–11.6]	89.9	[88.4–91.2]	9 006	4.8	[4.0–5.7]	95.2	[94.3–96.0]	8 763
Total	**20.8**	**[19.5–22.2]**	**79.2**	**[77.8–80.5]**	**15 377**	**6.7**	**[6.0–7.4]**	**93.3**	**[92.6–94.0]**	**14 948**
Age										
15–24	12.8	[11.2–14.6]	87.2	[85.4–88.8]	4 336	4.5	[3.4–6.0]	95.5	[94.0–96.6]	4 239
25–34	21.4	[19.0–24.1]	78.6	[75.9–81.0]	3 041	6.9	[5.6–8.5]	93.1	[91.5–94.4]	2 950
35–44	24.1	[21.7–26.6]	75.9	[73.4–78.3]	2 521	6.2	[5.0–7.8]	93.8	[92.2–95.0]	2 458
45–54	27.1	[24.4–29.9]	72.9	[70.1–75.6]	2 303	8.0	[6.3–10.1]	92.0	[89.9–93.7]	2 244
55–64	29.6	[26.3–33.1]	70.4	[66.9–73.7]	1 749	10.2	[8.0–12.9]	89.8	[87.1–92.0]	1 687
65+	18.8	[15.1–23.1]	81.2	[76.9–84.9]	1 422	8.6	[6.6–11.2]	91.4	[88.8–93.4]	1 365
Total	**20.8**	**[19.5–22.2]**	**79.2**	**[77.8–80.5]**	**15 372**	**6.7**	**[6.0–7.4]**	**93.3**	**[92.6–94.0]**	**14 943**
Locality										
Urban formal	23.1	[20.9–25.4]	76.9	[74.6–79.1]	8 324	6.6	[5.7–7.8]	93.4	[92.2–94.3]	8 061
Urban informal	19.8	[16.8–23.3]	80.2	[76.7–83.2]	1 911	7.3	[5.4–9.8]	92.7	[90.2–94.6]	1 874
Rural formal	24.5	[19.6–30.2]	75.5	[69.8–80.4]	1 868	8.1	[5.8–11.3]	91.9	[88.7–94.2]	1 826
Rural informal	14.8	[13.0–16.9]	85.2	[83.1–87.0]	3 280	6.0	[4.8–7.6]	94.0	[92.4–95.2]	3 193
Total	**20.8**	**[19.5–22.2]**	**79.2**	**[77.8–80.5]**	**15 383**	**6.7**	**[6.0–7.4]**	**93.3**	**[92.6–94.0]**	**14 954**

Table 3.4.1.1.1 (continued)

Province										
Western Cape	38.5	[33.6–43.6]	61.5	[56.4–66.4]	2 158	8.3	[6.1–11.1]	91.7	[88.9–93.9]	2 116
Eastern Cape	22.5	[19.1–26.3]	77.5	[73.7–80.9]	1 648	6.7	[5.1–8.7]	93.3	[91.3–94.9]	1 619
Northern Cape	33.2	[26.0–41.3]	66.8	[58.7–74.0]	1 001	11.1	[6.8–17.6]	88.9	[82.4–93.2]	994
Free State	32.2	[28.4–36.2]	67.8	[63.8–71.6]	831	21.6	[17.9–25.8]	78.4	[74.2–82.1]	811
KwaZulu-Natal	20.8	[18.3–23.6]	79.2	[76.4–81.7]	2 550	4.7	[3.5–6.2]	95.3	[93.8–96.5]	2 434
North West	14.9	[12.9–17.2]	85.1	[82.8–87.1]	1 935	3.2	[1.7–5.8]	96.8	[94.2–98.3]	1 838
Gauteng	16.0	[13.4–18.9]	84.0	[81.1–86.6]	2 644	5.3	[4.3–6.7]	94.7	[93.3–95.7]	2 587
Mpumalanga	17.6	[13.8–22.3]	82.4	[77.7–86.2]	1 342	5.6	[3.9–8.0]	94.4	[92.0–96.1]	1 311
Limpopo	14.4	[10.8–18.9]	85.6	[81.1–89.2]	1 274	7.5	[5.0–11.1]	92.5	[88.9–95.0]	1 244
Total	**20.8**	**[19.5–22.2]**	**79.2**	**[77.8–80.5]**	**15 383**	**6.7**	**[6.0–7.4]**	**93.3**	**[92.6–94.0]**	**14 954**
Race										
African	17.4	[16.1–18.8]	82.6	[81.2–83.9]	10225	6.6	[5.8–7.5]	93.4	[92.5–94.2]	9 945
White	24.5	[20.0–29.7]	75.5	[70.3–80.0]	714	5.2	[3.1–8.6]	94.8	[91.4–96.9]	686
Coloured	44.9	[41.4–48.4]	55.1	[51.6–58.6]	3075	9.8	[7.7–12.4]	90.2	[87.6–92.3]	3 016
Asian/Indian	25.2	[20.5–30.6]	74.8	[69.4–79.5]	1317	3.4	[1.6–7.1]	96.6	[92.9–98.4]	1 255
Total	**20.8**	**[19.5–22.2]**	**79.2**	**[77.8–80.5]**	**15331**	**6.7**	**[6.0–7.4]**	**93.3**	**[92.6–94.0]**	**14 902**
Total	**20.8**	**[19.5–22.2]**	**79.2**	**[77.8–80.5]**	**15383**	**6.7**	**[6.0–7.4]**	**93.3**	**[92.6–94.0]**	**14 954**

Other tobacco products include hand-rolled cigarettes, pipes, cigars, cheroots and cigarillos, hookah, hubbly bubbly, water pipe sessions, electronic cigarettes, snuff, chewing tobacco and smokeless tobacco.

 # The participants who answered 'No, not at all' to the question 'Do you currently smoke tobacco or use tobacco products?' were defined as never-smokers or never-users.

95% CI: 95% confidence interval

Table 3.4.1.1.2: Prevalence of ever smoking tobacco and using other tobacco products among male participants by age, locality, province and race, South Africa 2012

Background characteristics	Have ever smoked tobacco					Have ever used other tobacco product*				
	Have ever smoked		Have never smoked		Total	Have ever used		Have never used#		Total
	%	95% CI	%	95% CI	n	%	95% CI	%	95% CI	n
Age										
15–24	19.7	[17.2–22.4]	80.3	[77.6–82.8]	1 998	6.4	[4.9–8.2]	93.6	[91.8–95.1]	1 955
25–34	34.7	[30.1–39.5]	65.3	[60.5–69.9]	1 276	10.9	[8.5–13.9]	89.1	[86.1–91.5]	1 237
35–44	38.8	[34.3–43.4]	61.2	[56.6–65.7]	976	7.3	[5.4–9.8]	92.7	[90.2–94.6]	945
45–54	44.3	[38.8–49.9]	55.7	[50.1–61.2]	912	10.0	[7.4–13.2]	90.0	[86.8–92.6]	886
55–64	41.5	[35.2–48.1]	58.5	[51.9–64.8]	722	12.4	[9.1–16.8]	87.6	[83.2–90.9]	696
65+	32.8	[26.7–39.5]	67.2	[60.5–73.3]	482	9.6	[6.5–13.9]	90.4	[86.1–93.5]	461
Total	**32.8**	**[30.5–35.2]**	**67.2**	**[64.8–69.5]**	**6 366**	**8.8**	**[7.8–10.0]**	**91.2**	**[90.0–92.2]**	**6 180**
Locality										
Urban formal	33.3	[29.7–37.0]	66.7	[63.0–70.3]	3 494	9.1	[7.7–10.8]	90.9	[89.2–92.3]	3 372
Urban informal	34.0	[29.6–38.8]	66.0	[61.2–70.4]	755	9.7	[7.0–13.1]	90.3	[86.9–93.0]	742
Rural formal	35.9	[29.7–42.5]	64.1	[57.5–70.3]	849	9.6	[6.6–13.7]	90.4	[86.3–93.4]	834
Rural informal	30.0	[26.3–34.0]	70.0	[66.0–73.7]	1 273	7.3	[5.6–9.5]	92.7	[90.5–94.4]	1 237
Total	**32.8**	**[30.5–35.2]**	**67.2**	**[64.8–69.5]**	**6 371**	**8.8**	**[7.8–10.0]**	**91.2**	**[90.0–92.2]**	**6 185**
Province										
Western Cape	46.0	[39.4–52.7]	54.0	[47.3–60.6]	916	11.4	[8.3–15.4]	88.6	[84.6–91.7]	896
Eastern Cape	36.8	[31.2–42.8]	63.2	[57.2–68.8]	694	8.7	[6.0–12.3]	91.3	[87.7–94.0]	686
Northern Cape	40.2	[30.2–51.2]	59.8	[48.8–69.8]	414	11.2	[6.6–18.4]	88.8	[81.6–93.4]	409
Free State	50.4	[45.9–54.9]	49.6	[45.1–54.1]	349	21.8	[16.4–28.4]	78.2	[71.6–83.6]	342
KwaZulu-Natal	38.1	[33.6–42.8]	61.9	[57.2–66.4]	1 074	6.9	[5.0–9.4]	93.1	[90.6–95.0]	1 029
North West	25.2	[21.5–29.3]	74.8	[70.7–78.5]	752	2.9	[1.4–5.7]	97.1	[94.3–98.6]	703
Gauteng	24.6	[20.1–29.8]	75.4	[70.2–79.9]	1 134	7.8	[6.1–10.1]	92.2	[89.9–93.9]	1 107
Mpumalanga	33.6	[26.8–41.2]	66.4	[58.8–73.2]	539	8.9	[5.9–13.4]	91.1	[86.6–94.1]	521
Limpopo	29.4	[22.9–36.9]	70.6	[63.1–77.1]	499	9.8	[6.5–14.4]	90.2	[85.6–93.5]	492
Total	**32.8**	**[30.5–35.2]**	**67.2**	**[64.8–69.5]**	**6 371**	**8.8**	**[7.8–10.0]**	**91.2**	**[90.0–92.2]**	**6 185**
Race										
African	31.4	[28.8–34.2]	68.6	[65.8–71.2]	4 146	8.8	[7.7–10.1]	91.2	[89.9–92.3]	4 023
White	25.5	[18.8–33.6]	74.5	[66.4–81.2]	325	5.2	[2.8–9.3]	94.8	[90.7–97.2]	314
Coloured	50.8	[45.1–56.5]	49.2	[43.5–54.9]	1 275	13.6	[10.4–17.5]	86.4	[82.5–89.6]	1 252
Asian/Indian	41.4	[32.8–50.5]	58.6	[49.5–67.2]	596	5.9	[2.6–12.5]	94.1	[87.5–97.4]	567
Total	32.8	[30.5–35.2]	67.2	[64.8–69.5]	6 342	8.8	[7.8–10.0]	91.2	[90.0–92.2]	6 156

** Other tobacco products include hand-rolled cigarettes, pipes, cigars, cheroots and cigarillos, hookah, bubbly bubbly, water pipe sessions, electronic cigarettes, snuff, chewing tobacco and smokeless tobacco.*

 # The participants who answered 'No, not at all' to the question 'Do you currently smoke tobacco or use tobacco products?' were defined as never-smokers or never-users.

95% CI: 95% confidence interval

For males, the prevalence of having ever used other tobacco products is 8.8%. Individuals 15–24 years of age (6.4%) reported a significantly lower prevalence than those 25–34 years of age (10.9%).

The prevalence of males who had ever used other tobacco products did not vary significantly by locality. The Free State (21.8%) reported a significantly higher prevalence of males who had ever used other tobacco products than the national prevalence.

Significantly more coloured males had ever used other tobacco products (13.6%) when compared to white males (5.2) and African males (8.8%).

The national prevalence of having ever smoked tobacco among females was 10.1%. The prevalence of ever smoking tobacco among females increases with age until the group 55–64 years of age. Females 15–24 years of age had a significantly lower prevalence of ever smoking tobacco (6.0%) than the national prevalence (10.1%).

Females from rural informal localities reported the lowest rate of ever smoking tobacco (2.7%), which was significantly lower than the national rate (10.1%) and significantly lower than all other localities. Western Cape females (31.7%) reported the highest prevalence of having ever smoked tobacco, which was significantly higher than the national prevalence.

Coloured females reported a significantly higher prevalence of ever smoking tobacco (39.7%) when compared to white (23.7%), Indian (9.4%) and black African (4.8%) females.

The national prevalence of having ever used other tobacco products among females is 4.8%. Females 25–34 years of age have a significantly lower prevalence (3.1%) of having ever used of other tobacco products compared to females 45–54 years of age (6.4%), 55–64 years of age (8.3%) and 65 years of age and older (8.1%). Furthermore, females 15–24 (2.7%) years of age have a significantly lower prevalence of having ever used other tobacco products when compared to those 55–64 years of age (8.3%) and 65 years of age and older (8.1%).

Among females the prevalence of ever using other tobacco products was highest for individuals from rural formal localities (6.6%). Females in the Free State reported the highest rates of ever using other tobacco products (21.4%), which is significantly higher than the national rate (4.8%).

Coloured females reported the highest rate of having ever used other tobacco products (6.5%), which is significantly higher than for Indian females (1%).

3.4.1.2 Patterns of tobacco smoking behaviour among ever tobacco smokers and ever users of other tobacco products

Patterns of smoking behaviour are presented in this section.

Patterns of tobacco smoking behaviour among ever smokers

Patterns of tobacco smoking and the use of other tobacco products for individuals who reported having ever smoked tobacco or having ever used other tobacco products are presented in Table 3.4.1.2.1. Ever smokers were described as those who reported being daily smokers, less than daily smokers, and those who have quit smoking. Similarly, ever users of other tobacco products were described as those who reported being daily users, less than daily users, or those who have quit using other tobacco products.

Table 3.4.1.1.3: Prevalence of ever smoking tobacco and using other tobacco products among female participants by age, locality, province and race, South Africa 2012

Background characteristics	Have ever smoked tobacco					Have ever used other tobacco product				
	Have ever smoked		Have never smoked		Total	Have ever used		Have never used		Total
	%	95% CI	%	95% CI	n	%	95% CI	%	95% CI	n
Age										
15–24	6.0	[4.4–8.2]	94.0	[91.8–95.6]	2 336	2.7	[1.3–5.5]	97.3	[94.5–98.7]	2 282
25–34	8.9	[7.4–10.7]	91.1	[89.3–92.6]	1 765	3.1	[2.2–4.4]	96.9	[95.6–97.8]	1 713
35–44	10.7	[8.7–13.2]	89.3	[86.8–91.3]	1 544	5.3	[3.9–7.2]	94.7	[92.8–96.1]	1 512
45–54	12.1	[9.4–15.5]	87.9	[84.5–90.6]	1 389	6.4	[4.8–8.4]	93.6	[91.6–95.2]	1 356
55–64	19.8	[14.4–26.6]	80.2	[73.4–85.6]	1 026	8.3	[6.1–11.3]	91.7	[88.7–93.9]	990
65+	11.0	[7.4–16.0]	89.0	[84.0–92.6]	940	8.1	[6.1–10.7]	91.9	[89.3–93.9]	904
Total	**10.1**	**[8.8–11.6]**	**89.9**	**[88.4–91.2]**	**9 000**	**4.8**	**[4.0–5.7]**	**95.2**	**[94.3–96.0]**	**8 757**
Locality										
Urban formal	13.6	[11.4–16.2]	86.4	[83.8–88.6]	4 828	4.3	[3.2–5.8]	95.7	[94.2–96.8]	4 687
Urban informal	8.0	[5.5–11.6]	92.0	[88.4–94.5]	1 155	5.3	[3.6–7.9]	94.7	[92.1–96.4]	1 131
Rural formal	12.4	[8.2–18.4]	87.6	[81.6–91.8]	1 019	6.6	[4.4–9.6]	93.4	[90.4–95.6]	992
Rural informal	2.7	[1.9–3.7]	97.3	[96.3–98.1]	2 004	5.0	[3.9–6.5]	95.0	[93.5–96.1]	1 953
Total	**10.1**	**[8.8–11.6]**	**89.9**	**[88.4–91.2]**	**9 006**	**4.8**	**[4.0–5.7]**	**95.2**	**[94.3–96.0]**	**8 763**
Province										
Western Cape	31.7	[26.2–37.8]	68.3	[62.2–73.8]	1 242	5.5	[3.5–8.7]	94.5	[91.3–96.5]	1 220
Eastern Cape	9.3	[6.5–13.2]	90.7	[86.8–93.5]	950	4.9	[3.4–6.9]	95.1	[93.1–96.6]	929
Northern Cape	26.4	[20.1–33.9]	73.6	[66.1–79.9]	587	11.0	[6.4–18.3]	89.0	[81.7–93.6]	585
Free State	14.6	[10.4–20.0]	85.4	[80.0–89.6]	482	21.4	[17.3–26.1]	78.6	[73.9–82.7]	469
KwaZulu-Natal	7.0	[3.9–12.5]	93.0	[87.5–96.1]	1 476	2.9	[1.8–4.7]	97.1	[95.3–98.2]	1 405
North West	6.5	[4.9–8.6]	93.5	[91.4–95.1]	1 183	3.4	[1.7–6.5]	96.6	[93.5–98.3]	1 135
Gauteng	7.3	[4.9–10.6]	92.7	[89.4–95.1]	1 509	2.9	[1.6–5.2]	97.1	[94.8–98.4]	1 479
Mpumalanga	3.9	[2.4–6.2]	96.1	[93.8–97.6]	802	2.8	[1.5–5.2]	97.2	[94.8–98.5]	789
Limpopo	2.9	[1.6–5.2]	97.1	[94.8–98.4]	775	5.8	[3.7–9.0]	94.2	[91.0–96.3]	752
Total	**10.1**	**[8.8–11.6]**	**89.9**	**[88.4–91.2]**	**9 006**	**4.8**	**[4.0–5.7]**	**95.2**	**[94.3–96.0]**	**8 763**
Race										
African	4.8	[4.1–5.6]	95.2	[94.4–95.9]	6 076	4.6	[3.8–5.6]	95.4	[94.4–96.2]	5 919
White	23.7	[16.7–32.4]	76.3	[67.6–83.3]	389	5.2	[2.2–12.0]	94.8	[88.0–97.8]	372
Coloured	39.7	[35.6–43.9]	60.3	[56.1–64.4]	1 799	6.5	[4.9–8.7]	93.5	[91.3–95.1]	1 763
Asian/Indian	9.4	[6.7–13.0]	90.6	[87.0–93.3]	721	1.0	[0.4–2.2]	99.0	[97.8–99.6]	688
Total	10.1	[8.8–11.6]	89.9	[88.4–91.2]	8 985	4.8	[4.0–5.7]	95.2	[94.3–96.0]	8 742

** Other tobacco products include hand-rolled cigarettes, pipes, cigars, cheroots and cigarillos, hookah, hubbly bubbly, water pipe sessions, electronic cigarettes, snuff, chewing tobacco and smokeless tobacco.*

 # The participants who answered 'No, not at all' to the question 'Do you currently smoke tobacco or use tobacco products?' were defined as never-smokers or never-users.

95% CI: 95% confidence interval

Of those individuals who reported ever smoking tobacco, 72.5% currently smoke daily, 8.4% currently smoke less than daily and 19% have quit smoking tobacco. Daily smoking rates are significantly higher among males (76.1%) than females (62%). The prevalence of having quit smoking is significantly higher for females (29.5%) than for males (15.4%).

The lowest rate of daily smoking among those who have ever smoked tobacco was found among people 65 years of age and older (55.7%), which was significantly lower than the national rate (72.5%). People who had ever smoked tobacco in the group 15–24 years of age reported significantly higher rates of smoking less frequently than daily (12.8%) when compared to those 65 years of age and older (4.4%).

Individuals from rural formal localities who have ever smoked tobacco reported a significantly higher prevalence of smoking daily (83.3%) when compared to the national rate and to urban formal (71.8%) and rural informal (69%) localities. Individuals from rural formal localities also have the lowest rates of having quit smoking (8.2%), which is significantly lower than individuals from urban formal (21%) and rural informal (20.1%) localities.

The Northern Cape reported the highest rate of daily smoking among those who have ever smoked (83.5%), which is significantly higher than the national rate of 72.5%. Eastern Cape (65.7%) reported the lowest rate of daily smoking. The Free State reported the highest rate of smoking less frequently than daily among those who have ever smoked (12.5%). The prevalence of having quit smoking is highest in the Eastern Cape (23%).

Coloured individuals who had ever smoked tobacco reported a significantly higher daily smoking rate (81%) compared to black African (72.4%) and white (59.5%) individuals. Black Africans reported a significantly higher rate of smoking less frequently than daily (10.9%) than white (2.2%) and coloured (4.5%) individuals. Significantly more white individuals reported having quit smoking (38.3%) than all the other race groups.

The patterns of tobacco smoking behaviour by age, locality, province and race for males are presented in Table 3.4.1.2.2. Of those males who reported having ever smoking (32.8%), 76.1% smoke daily, 8.4% smoke less frequently than daily and 15.4% have quit smoking.

Individuals 25–34 years of age who had ever smoked tobacco reported the highest daily smoking rate (83.1%), which was significantly higher than for those who have ever smoked 65 years of age and older (55.6%). Individuals 15–24 years of age (14.7%), who had ever smoked tobacco reported significantly higher less freqently than daily smoking rates than the national rate of 8.4%.

Individuals 65 years of age and older reported the highest rate of having quit smoking tobacco (38.8%), which was significantly higher than the national rate of 15.4%.

Males from rural informal localities reported the highest rate of having quit smoking tobacco (18.3%) compared to those from rural formal localities (8.3%). The prevalence of having quit tobacco smoking was significantly lower for those who have ever smoked from rural formal localities (8.3%) than the national rate (15.4%).

Of the males who had ever smoked tobacco, the highest rate of daily smoking was found in the Northern Cape (84.1%) and the lowest in the Eastern Cape (68.4%). Eastern Cape males who had ever smoked tobacco reported the highest quit rates (20.4%) while Northern Cape reported the lowest rate (6.6%). There is no significant variation by race in the prevalence of daily smoking among current smokers.

Table 3.4.1.2.1: Patterns of tobacco smoking among participants who ever smoked by sex, age, locality, province and race, South Africa 2012

Background characteristics	Daily		Less frequently than daily		Quit		Total
	%	95% CI	%	95% CI	%	95% CI	n
Sex							
Male	76.1	[73.5–78.5]	8.4	[6.8–10.5]	15.4	[13.5–17.6]	2 218
Female	62.0	[54.0–69.5]	8.5	[6.2–11.4]	29.5	[22.0–38.3]	1 148
Total	72.5	[69.6–75.3]	8.4	[7.1–10.1]	19.0	[16.4–22.0]	3 366
Age							
15–24	72.5	[65.3–78.6]	12.8	[9.4–17.3]	14.7	[9.2–22.7]	601
25–34	78.9	[74.6–82.6]	10.0	[7.1–13.9]	11.2	[8.3–14.8]	717
35–44	76.7	[70.6–81.8]	6.6	[4.4–9.9]	16.7	[12.3–22.3]	611
45–54	72.1	[65.6–77.7]	7.5	[5.3–10.6]	20.4	[15.1–26.9]	662
55–64	62.1	[52.3–71.0]	6.0	[3.6–9.8]	31.9	[23.0–42.4]	509
65+	55.7	[46.0–64.9]	4.4	[2.3–8.0]	40.0	[30.9–49.8]	263
Total	72.5	[69.6–75.3]	8.4	[7.1–10.1]	19.0	[16.4–22.0]	3 363
Locality							
Urban formal	71.8	[67.6–75.6]	7.2	[5.5–9.3]	21.0	[17.2–25.4]	2 100
Urban informal	74.2	[66.8–80.4]	12.4	[7.6–19.5]	13.4	[9.9–18.1]	368
Rural formal	83.3	[76.9–88.2]	8.5	[4.5–15.5]	8.2	[5.3–12.4]	471
Rural informal	69.0	[63.7–73.8]	10.9	[8.1–14.6]	20.1	[16.1–24.8]	427
Total	72.5	[69.6–75.3]	8.4	[7.1–10.1]	19.0	[16.4–22.0]	3 366
Province							
Western Cape	77.4	[72.5–81.7]	4.1	[2.8–5.8]	18.5	[14.3–23.6]	886
Eastern Cape	65.7	[58.0–72.6]	11.3	[7.4–17.0]	23.0	[16.9–30.4]	401
Northern Cape	83.5	[75.6–89.2]	7.6	[4.5–12.4]	8.9	[4.7–16.3]	350
Free State	69.6	[62.1–76.1]	12.5	[7.5–19.9]	18.0	[12.1–25.8]	255
KwaZulu-Natal	70.1	[61.4–77.6]	11.1	[7.4–16.5]	18.7	[11.7–28.7]	482
North West	78.3	[69.1–85.3]	5.1	[2.8–8.9]	16.6	[11.0–24.4]	237
Gauteng	70.5	[62.0–77.7]	8.4	[5.4–12.8]	21.1	[14.3–30.1]	392
Mpumalanga	79.8	[74.2–84.4]	5.0	[2.6–9.6]	15.2	[11.1–20.4]	194
Limpopo	72.7	[64.3–79.8]	11.3	[6.0–20.4]	15.9	[10.5–23.4]	169
Total	72.5	[69.6–75.3]	8.4	[7.1–10.1]	19.0	[16.4–22.0]	3 366
Race							
African	72.4	[69.6–75.0]	10.9	[8.9–13.2]	16.8	[14.6–19.1]	1 598
White	59.5	[44.3–73.1]	2.2	[0.9–5.3]	38.3	[24.7–54.0]	192
Coloured	81.0	[76.5–84.8]	4.5	[3.3–6.2]	14.5	[10.9–19.0]	1 292
Asian/Indian	77.3	[68.7–84.1]	7.6	[4.4–12.9]	15.1	[10.1–22.0]	274
Total	72.5	[69.6–75.3]	8.4	[7.1–10.1]	19.0	[16.4–22.0]	3 356
Total	72.5	[69.6–75.3]	8.4	[7.1–10.1]	19.0	[16.4–22.0]	3 366

95% CI: 95% confidence interval

Table 3.4.1.2.2: Patterns of smoking among male ever smokers by age, locality, province and race, South Africa 2012

Background characteristics	Daily		Less frequently than daily		Quit		Total
	Row %	95% CI	Row %	95% CI	Row %	95% CI	n
Age							
15–24	76.6	[71.1–81.3]	14.7	[10.8–19.8]	8.7	[5.7–13.1]	415
25–34	83.1	[78.8–86.7]	7.8	[5.1–11.6]	9.1	[6.4–12.9]	491
35–44	79.9	[73.5–85.0]	7.0	[4.4–11.2]	13.1	[8.9–18.9]	397
45–54	74.5	[68.6–79.7]	7.5	[4.9–11.2]	18.0	[13.6–23.6]	426
55–64	69.0	[58.2–78.1]	6.0	[2.5–13.7]	25.0	[16.9–35.2]	174
65+	55.6	[46.5–64.4]	5.6	[3.0–10.1]	38.8	[30.1–48.2]	312
Total	76.1	[73.5–78.5]	8.4	[6.8–10.5]	15.4	[13.5–17.6]	2 215
Locality							
Urban formal	77.1	[73.6–80.3]	6.7	[4.7–9.5]	16.2	[13.5–19.3]	1 279
Urban informal	76.8	[68.0–83.8]	12.2	[6.7–21.3]	11.0	[7.5–15.8]	256
Rural formal	82.0	[74.4–87.8]	9.6	[4.8–18.5]	8.3	[5.1–13.2]	319
Rural informal	70.5	[65.3–75.2]	11.2	[8.3–14.9]	18.3	[14.5–22.9]	364
Total	76.1	[73.5–78.5]	8.4	[6.8–10.5]	15.4	[13.5–17.6]	2 218
Province							
Western Cape	78.3	[72.2–83.4]	3.5	[2.1–6.1]	18.2	[13.1–24.6]	443
Eastern Cape	68.4	[59.3–76.2]	11.3	[6.9–17.8]	20.4	[14.1–28.4]	271
Northern Cape	84.1	[76.9–89.3]	9.3	[5.4–15.7]	6.6	[3.4–12.3]	192
Free State	72.7	[63.0–80.7]	15.4	[9.0–25.0]	11.9	[6.9–19.8]	176
KwaZulu-Natal	75.1	[69.3–80.2]	11.9	[7.6–18.2]	12.9	[9.5–17.5]	395
North West	79.8	[70.5–86.7]	5.1	[2.3–11.0]	15.1	[9.5–23.1]	164
Gauteng	79.2	[73.2–84.1]	5.6	[2.9–10.6]	15.2	[11.3–20.1]	272
Mpumalanga	79.6	[73.6–84.5]	5.0	[2.5–9.9]	15.4	[10.9–21.2]	164
Limpopo	72.5	[63.3–80.1]	12.6	[6.7–22.5]	14.9	[9.4–22.8]	141
Total	76.1	[73.5–78.5]	8.4	[6.8–10.5]	15.4	[13.5–17.6]	2 218
Race							
African	75.7	[72.7–78.5]	10.2	[8.0–12.9]	14.1	[12.1–16.3]	1 268
White	65.9	[50.4–78.6]	2.9	[1.0–8.3]	31.2	[19.1–46.5]	110
Coloured	82.9	[77.8–87.0]	3.5	[2.1–5.6]	13.7	[9.8–18.8]	618
Asian/Indian	84.5	[73.9–91.3]	2.8	[1.3–6.1]	12.7	[6.9–22.2]	215
Total	76.1	[73.5–78.5]	8.4	[6.8–10.5]	15.4	[13.5–17.6]	2 218

95% CI: 95% confidence interval

The patterns of tobacco smoking behaviour by age, locality, province and race for females are presented in Table 3.4.1.2.3. Of those females who reported having ever smoked (10.1%), 62% said that they smoked daily, 8.5% less frequently than daily and 29.5% have quit smoking.

Females who have ever smoked tobacco from rural formal localities reported a significantly higher daily tobacco smoking rate (87.2%) than the national rate (62.0%), as well as a significantly lower rate of having quit tobacco smoking (7.8%) than the national rate (29.5%).

The highest daily smoking rate for females who have ever smoked tobacco was observed in the Northern Cape (82.7%) while the lowest was observed in Gauteng (40.8%). Females who have ever smoked in Gauteng reported the highest less frequently than daily smoking rates (17.8%), and females who have ever smoked in KwaZulu-Natal reported the highest quitting rates (44%).

Coloured females reported a significantly higher daily smoking rate (78.9%) than the national average. Indian females reported a significantly higher rate (27.8%) of less frequently than daily smoking than the national rate. Black African (32.8%) and white females (45.3%) reported significantly higher rates of having quit smoking than coloured females (15.4%).

Patterns of other tobacco product use among those who have ever used other tobacco products

Patterns of use of other tobacco products for individuals who reported having ever used other tobacco products are presented in Table 3.4.1.2.4.

Among the individuals who reported ever having used other tobacco products (6.7%), 61.6% said that they use them daily, 14.8% use them less frequently than daily, and 23.6% said they have quit using other tobacco products.

Among users who have ever used other tobacco products, using other tobacco products on a daily basis is significantly higher for individuals 65 years of age and older (77.6%) than those 15–24 years of age (47.5%) and those 25–34 years of age (58.5%).

Those who have ever used in the group 15–24 years of age reported a significantly higher rate of less frequent than daily use of other tobacco products (25.6%) than those 65 years of age and older (7.7%).

Those who have ever used other tobacco products from rural formal localities had the highest rate of daily use of other tobacco products (82.3%), which was significantly higher than the national rate of 61.6%, and significantly higher than among Individuals from urban formal localities (56.7%).

The patterns of use of other tobacco products by age, locality, province and race for males are presented in Table 3.4.1.2.5. Among male who have ever used other tobacco products, those 65 years and older reported a significantly higher rate of using them daily (86.4%) than those 15–24 years of age (53.3%) and those 25–34 years of age (56.9%). Males who have ever used other tobacco products North West (75.2%) reported the highest prevalence of males who have ever used other tobacco products who use them daily while the Western Cape (39.3%) reported the lowest prevalence.

Table 3.4.1.2.3: Patterns of smoking among female ever smokers by age, locality, province and race, South Africa 2012

Background characteristics	Yes, daily		Yes, less than daily		Quit		Total
	%	95% CI	%	95% CI	%	95% CI	n
Age							
15–24	58.9	[39.7–75.7]	6.7	[2.6–16.1]	34.4	[17.5–56.4]	186
25–34	62.9	[52.2–72.5]	18.3	[10.9–29.0]	18.8	[12.0–28.3]	226
35–44	66.3	[53.5–77.1]	5.2	[2.1–12.3]	28.4	[17.9–41.9]	214
45–54	64.5	[47.4–78.5]	7.8	[4.0–14.6]	27.7	[14.1–47.3]	236
55–64	53.5	[26.9–78.3]	6.3	[2.0–17.7]	40.2	[15.7–70.8]	113
65+	62.0	[49.9–72.9]	4.0	[2.0–7.7]	34.0	[23.8–45.9]	173
Total	62.0	[54.0–69.5]	8.5	[6.2–11.4]	29.5	[22.0–38.3]	1 148
Locality							
Urban formal	59.5	[49.6–68.7]	8.4	[5.7–12.2]	32.1	[22.8–43.0]	821
Urban informal	64.4	[50.6–76.1]	13.0	[7.3–22.0]	22.7	[14.0–34.5]	112
Rural formal	87.2	[78.7–92.7]	5.0	[2.2–10.6]	7.8	[3.7–15.6]	152
Rural informal	*	*	*	*	*	*	63
Total	62.0	[54.0–69.5]	8.5	[6.2–11.4]	29.5	[22.0–38.3]	1 148
Province							
Western Cape	76.3	[68.1–82.9]	4.7	[2.7–8.1]	19.0	[12.5–27.7]	443
Eastern Cape	55.9	[42.7–68.3]	11.6	[6.4–19.9]	32.5	[20.8–46.9]	130
Northern Cape	82.7	[68.1–91.4]	5.1	[2.3–10.7]	12.3	[4.8–28.1]	158
Free State	*	*	*	*	*	*	79
KwaZulu-Natal	*	*	*	*	*	*	87
North West	*	*	*	*	*	*	73
Gauteng	40.8	[23.3–60.9]	17.8	[9.7–30.5]	41.4	[20.8–65.6]	120
Mpumalanga	*	*	*		*	*	30
Limpopo	*	*	*		*	*	28
Total	62.0	[54.0–69.5]	8.5	[6.2–11.4]	29.5	[22.0–38.3]	1 148
Race							
African	52.4	[43.8–60.8]	14.8	[10.2–21.1]	32.8	[25.7–40.8]	330
White	*	*	*	*	*	*	82
Coloured	78.9	[71.9–84.5]	5.7	[3.8–8.7]	15.4	[10.1–22.7]	674
Asian/Indian	*	*	*	*	*	*	59
Total	62.0	[54.0–69.5]	8.5	[6.2–11.4]	29.5	[22.0–38.3]	1 147

95% CI: 95% confidence interval

** Too few observations to report reliably*

Table 3.4.1.2.4: Patterns of other tobacco product use among all ever users of other tobacco products by sex, age, locality, province and race, South Africa 2012

Background characteristics	Daily		Less than daily		Quit		Total
	row %	95% CI	row %	95% CI	row %	95% CI	n
Sex							
Male	60.4	[54.4–66.1]	16.0	[12.3–20.6]	23.6	[18.7–29.3]	543
Female	63.6	[54.7–71.8]	12.8	[8.9–18.0]	23.6	[15.7–33.8]	444
Total	61.6	[56.5–66.5]	14.8	[11.8–18.4]	23.6	[19.1–28.8]	987
Age							
15–24	47.5	[32.6–62.8]	25.6	[16.7–37.2]	26.9	[13.7–46.0]	173
25–34	58.5	[48.1–68.2]	12.5	[7.7–19.8]	29.0	[20.6–39.1]	193
35–44	70.5	[59.7–79.4]	15.3	[8.6–25.8]	14.2	[8.7–22.3]	165
45–54	65.3	[55.2–74.3]	15.2	[8.9–25.0]	19.4	[12.8–28.5]	188
55–64	61.3	[50.1–71.4]	6.9	[2.2–19.7]	31.8	[22.1–43.4]	149
65+	77.6	[68.8–84.6]	7.7	[3.6–15.6]	14.7	[9.0–23.0]	118
Total	61.6	[56.5–66.5]	14.8	[11.8–18.4]	23.6	[19.1–28.8]	986
Locality							
Urban formal	56.7	[48.7–64.3]	15.2	[11.0–20.6]	28.1	[21.0–36.6]	489
Urban informal	62.2	[51.6–71.7]	16.5	[9.8–26.5]	21.3	[13.1–32.7]	129
Rural formal	82.3	[71.5–89.6]	7.2	[3.5–14.5]	10.5	[4.8–21.2]	169
Rural informal	65.0	[58.1–71.2]	16.3	[10.7–24.1]	18.7	[13.9–24.7]	200
Total	61.6	[56.5–66.5]	14.8	[11.8–18.4]	23.6	[19.1–28.8]	987
Province							
Western Cape	50.1	[34.3–66.0]	21.2	[12.2–34.3]	28.7	[18.6–41.5]	189
Eastern Cape	70.0	[59.7–78.6]	13.8	[7.8–23.3]	16.1	[10.4–24.1]	116
Northern Cape	76.2	[60.5–87.0]	11.5	[6.1–20.6]	12.3	[5.5–25.2]	120
Free State	69.9	[58.8–79.1]	12.6	[7.6–20.0]	17.5	[9.7–29.6]	161
KwaZulu-Natal	*	*	*	*	*	*	95
North West	*	*	*	*	*	*	59
Gauteng	55.7	[42.5–68.1]	12.1	[6.4–21.4]	32.3	[20.0–47.6]	107
Mpumalanga	*	*	*	*	*	*	62
Limpopo	*	*	*	*	*	*	88
Total	61.6	[56.5–66.5]	14.8	[11.8–18.4]	23.6	[19.1–28.8]	987
Race							
African	65.7	[60.8–70.3]	13.6	[10.5–17.4]	20.7	[16.6–25.5]	633
White	*	*	*	*	*	*	27
Coloured	59.0	[47.2–69.9]	19.7	[12.6–29.3]	21.3	[14.8–29.7]	292
Asian/Indian	*	*	*	*	*	*	31
Total	61.6	[56.5–66.5]	14.8	[11.8–18.4]	23.6	[19.1–28.8]	983

Other tobacco products include hand-rolled cigarettes, pipes, cigars, cheroots and cigarillos, hookah, hubbly bubbly, water pipe sessions, electronic cigarettes, snuff, chewing tobacco and smokeless tobacco.

95% CI: 95% confidence interval

** Too few observations to report reliably*

Table 3.4.1.2.5: Patterns of use of other tobacco products among male participants who reported having ever used other tobacco products by age, locality, province and race, South Africa 2012

Background characteristics	Daily		Less than daily		Quit		Total
	row %	95% CI	row %	95% CI	row %	95% CI	n
Age							
15–24	53.3	[39.6–66.6]	29.3	[19.3–41.9]	17.3	[10.5–27.3]	119
25–34	56.9	[45.1–68.0]	13.8	[8.1–22.7]	29.3	[19.9–40.8]	131
35–44	*	*	*	*	*	*	79
45–54	*	*	*	*	*	*	94
55–64	*	*	*	*	*	*	78
65+	*	*	*	*	*	*	41
Locality							
Urban formal	58.6	[50.1–66.6]	15.8	[11.0–22.2]	25.6	[18.6–34.1]	286
Urban informal	*	*	*	*	*	*	67
Rural formal	*	*	*	*	*	*	99
Rural informal	*	*	*	*	*	*	91
Province							
Western Cape	39.3	[24.6–56.3]	23.1	[13.3–37.0]	37.6	[24.8–52.4]	117
Eastern Cape	*	*	*	*	*	*	65
Northern Cape	*	*	*	*	*	*	59
Free State	*	*	*	*	*	*	67
KwaZulu-Natal	*	*	*	*	*	*	59
North West	*	*	*	*	*	*	21
Gauteng	*	*	*	*	*	*	72
Mpumalanga	*	*	*	*	*	*	41
Limpopo	*	*	*	*	*	*	42
Race							
African	63.4	[56.5–69.7]	14.7	[10.7–20.0]	21.9	[16.4–28.5]	328
White	*	*	*	*	*	*	18
Coloured	55.8	[43.1–67.7]	22.3	[13.6–34.3]	22.0	[14.9–31.3]	172
Asian/Indian	*	*	*	*	*	*	22
Total	60.4	[54.4–66.1]	16.0	[12.3–20.6]	23.6	[18.7–29.3]	540

95% CI: 95% confidence interval

** Too few observations to report reliably*

The patterns of use of other tobacco products by age, locality, province and race for females are presented in Table 3.4.1.2.6. Among those females who reported having ever used other tobacco products (4.8%), patterns of the use of other tobacco products did not differ significantly by age, or province. For females who reported havig ever used other tobacco products, 63.6% reported using them daily, 12.8% reported using them less frequently than daily, and 23.6% said that they have quit using other tobacco products.

Females from rural formal localities who had ever used other tobacco products reported a significantly higher prevalence of using other tobacco products daily (89.0%) than the national rate (63.6%) and also compared to females who have ever used from urban formal localities (53.0%). Urban informal female residents reported the highest prevalence of using other tobacco products less frequently than daily (25.1%). Females from urban formal localities reported a significantly higher prevalence of having quit using other tobacco products (33.0%) than those from rural formal localities (6.4%).

Table 3.4.1.2.6 Patterns of use of other tobacco products among female participants who reported having ever used other tobacco products by age, locality, province and race, South Africa 2012

Background characteristics	Yes, daily		Yes, less than daily		No, not at all		Total
	row %	95% CI	row %	95% CI	row %	95% CI	n
Age							
15 to 24	*	*	*	*	*	*	54
25 to 34	*	*	*	*	*	*	62
35 to 44	*	*	*	*	*	*	86
45 to 54	*	*	*	*	*	*	94
55 to 64	*	*	*	*	*	*	71
65+	*	*	*	*	*	*	77
Total	63.6	[54.7-71.8]	12.8	[8.9-18.0]	23.6	[15.7-33.8]	444
Locality							
Urban formal	53.0	[39.1–66.4]	14.0	[8.2–22.9]	33.0	[19.8–49.6]	203
Urban informal	*	*	*	*	*	*	62
Rural formal	*	*	*	*	*	*	70
Rural informal	74.6	[65.5–81.9]	8.6	[4.3–16.4]	16.9	[10.2–26.5]	109
Total	63.6	[54.7–71.8]	12.8	[8.9–18.0]	23.6	[15.7–33.8]	444
Province							
Western Cape	*	*	*	*	*	*	72
Eastern Cape	*	*	*	*	*	*	51
Northern Cape	*	*	*	*	*	*	61
Free State	*	*	*	*	*	*	94
KwaZulu-Natal	*	*	*	*	*	*	36
North West	*	*	*	*	*	*	28
Gauteng	*	*	*	*	*	*	35
Mpumalanga	*	*	*	*	*	*	21
Limpopo	*	*	*	*	*	*	46
Total	63.6	[54.7-71.8]	12.8	[8.9-18.0]	23.6	[15.7-33.8]	444
Race							
African	69.8	[63.4–75.5]	11.6	[7.9–16.7]	18.7	[14.1–24.3]	305
White	*	*	*	*	*	*	9
Coloured	64.7	[49.6–77.3]	15.1	[8.5–25.4]	20.2	[10.5–35.2]	120
Asian/Indian	*	*	*	*	*	*	9
Total	63.7	[54.7–71.8]	12.8	[8.9–18.0]	23.6	[15.7–33.8]	443

Other tobacco products include hand-rolled cigarettes, pipes, cigars, cheroots and cigarillos, hookah, hubbly bubbly, water pipe sessions, electronic cigarettes, snuff, chewing tobacco and smokeless tobacco.

95% CI: 95% confidence interval

** Too few observations to report reliably*

3.4.1.3 Age of initiation of tobacco use, duration of use and number of cigarettes smoked per day

This section focuses on different aspects of tobacco use.

Age of initiation of smoking among those who have ever smoked

The mean age of initiation of tobacco smoking is 17.4 years (Table 3.4.1.3.1). Those 15–24 years of age had a significantly younger age of initiation (mean 13.4 years) than those in older age groups: 25–34 years of age (mean age of initiation 15.8 years), 35–44 years of age (mean age of initiation 18.2), 45–54 years of age (mean age of initiation 19.1 years), 55–64 years of age (mean age of initiation 20 years), and 65 years of age and older (mean age of initiation 22.5 years).

There was no significant variation in the mean age of initiation of tobacco smoking by locality. However, Western Cape residents had the lowest mean age of initiation of smoking (14.5 years), which is significantly lower than the national average of 17.4 years. Indian individuals had the lowest mean age of initiation of smoking (10.9 years), which is significantly lower than for black African individuals (18.1 years).

Duration of smoking

The mean duration of smoking among individuals who currently smoked was 17.9 years (Table 4.4.7). The average duration of smoking is highest for the Free State province at 20.2 years. Black African individuals reported a significantly lower mean duration of smoking (16.1) than white (23.5 years) and coloured (20.3 years) individuals.

Number of cigarettes smoked per day among current smokers

Among current smokers, the mean number of cigarettes smoked per day was 8.5 (Table 4.4.7).The mean number of cigarettes smoked per day among current smokers increased with age until 64 years of age and decreased thereafter. Current smokers 15–24 years of age reported a significantly lower mean number of cigarettes smoked per day (5.9 cigarettes) than the national average (8.5 cigarettes).The mean number of cigarettes smoked per day among current smokers is significantly lower for individuals from urban informal localities (6.7 cigarettes) than the national average of 8.5 cigarettes smoked per day. Current smokers in the Northern Cape reported the highest mean number of cigarettes smoked per day (13.6). Black African current smokers reported smoking a significantly lower mean number of cigarettes per day (7.6) cigarettes compared to all other race groups.

The mean age for having started using other tobacco products by sex, age, locality, province, and race is presented in Table 3.4.1.3.2.

The mean age for having first used other tobacco products among current users is 23.9 years of age. The mean age of initiation of using other tobacco products is significantly lower for males (21.5 years) than for females (27.9 years). Individuals 15–24 years of age (16.2 years) and 25–34 years of age (19.6 years) had a significantly lower mean age of initiation than the national mean age of initiation of 23.9 years. Individuals from rural informal localities reported a significantly higher mean age of initiation of using other tobacco products (28.5 years) when compared to the national rate and the rates of the other localities.

Users of other tobacco products in the Western Cape reported a significantly lower mean age of having initiated the use of other tobacco products (19.6 years) than the national average (23.9 years). Black African users of other tobacco products reported a significantly higher mean age of initiation of other tobacco products (24.9 years) when compared to coloured (19.6 years) and Indian (19.2 years) users of other tobacco products.

Table 3.4.1.3.1: Mean age when started smoking, duration of smoking and number of cigarettes smoked per day among all participants aged 15 years and older who currently smoke by sex, age, locality, province and race, South Africa 2012

Background characteristics	Age of initiation tobacco smoking			Duration of smoking(years)			Number of cigarettes per day		
	Mean	95% CI	Total	Mean	95% CI	Total	95% CI	95% CI	Total
Sex									
Male	17.9	[17.2–18.5]	2 379	17.5	[16.5–18.4]	1 866	8.0	[7.4–8.7]	1 841
Female	16.4	[14.4–18.5]	1 394	19.4	[17.7–21.0]	918	10.0	[8.2–11.8]	889
Total	17.4	[16.5–18.4]	3 773	17.9	[17.0–18.7]	2 784	8.5	[7.8–9.1]	2 730
Age									
15–24	13.4	[12.1–14.6]	722	5.0	[4.5–5.4]	520	5.9	[5.4–6.5]	516
25–34	15.8	[14.7–17.0]	812	11.0	[10.3–11.7]	649	7.8	[6.7–8.8]	626
35–44	18.2	[17.2–19.3]	672	18.5	[17.5–19.6]	526	8.8	[7.6–10.1]	517
45–54	19.1	[17.8–20.4]	728	25.6	[24.3–27.0]	534	9.6	[8.3–11.0]	526
55–64	20.0	[18.6–21.3]	311	30.1	[27.5–32.6]	215	11.1	[7.9–14.3]	218
65+	22.5	[19.6–25.3]	525	39.3	[36.2–42.5]	338	10.6	[8.7–12.5]	325
Total	17.4	[16.5–18.4]	3 770	17.9	[17.0–18.7]	2 782	8.5	[7.8–9.1]	2 728
Locality									
Urban formal	17.2	[15.9–18.5]	2 360	18.3	[17.2–19.5]	1 712	8.7	[7.9–9.5]	1 698
Urban informal	17.1	[15.7–18.5]	421	13.3	[11.9–14.6]	315	6.7	[5.8–7.5]	308
Rural formal	18.4	[17.1–19.8]	504	19.1	[17.5–20.7]	442	11.1	[7.7–14.4]	425
Rural informal	18.0	[15.7–20.4]	490	17.9	[16.0–19.8]	316	6.9	[6.0–7.9]	300
Total	17.4	[16.5–18.4]	3 775	17.9	[17.0–18.7]	2 785	8.5	[7.8–9.1]	2 731
Province									
Western Cape	14.5	[13.1–16.0]	1040	21.0	[19.3–22.8]	758	9.3	[8.4–10.2]	767
Eastern Cape	18.0	[16.0–20.0]	468	17.8	[16.4–19.3]	323	7.6	[6.2–9.0]	308
Northern Cape	17.3	[14.8–19.9]	377	19.9	[18.3–21.5]	328	13.6	[9.1–18.0]	321
Free State	19.6	[18.6–20.5]	255	20.2	[17.7–22.8]	200	6.3	[5.3–7.4]	185
KwaZulu-Natal	16.2	[12.2–20.2]	569	16.5	[14.0–18.9]	370	7.5	[6.6–8.4]	371
North West	20.4	[19.0–21.8]	249	20.1	[17.9–22.3]	194	9.1	[7.1–11.1]	187
Gauteng	18.4	[16.9–19.9]	449	15.3	[13.7–17.0]	313	8.8	[6.6–10.9]	300
Mpumalanga	19.3	[17.5–21.2]	201	15.4	[12.2–18.6]	157	8.3	[5.6–11.1]	157
Limpopo	20.4	[18.5–22.2]	167	16.8	[13.5–20.0]	142	7.8	[6.6–9.1]	135
Total	17.4	[16.5–18.4]	3775	17.9	[17.0–18.7]	2785	8.5	[7.8–9.1]	2 731
Race									
African	18.1	[17.0–19.2]	1804	16.1	[15.2–17.0]	1304	7.6	[6.8–8.4]	1 253
White	18.7	[15.9–21.5]	198	23.5	[20.0–27.0]	133	11.1	[8.8–13.4]	127
Coloured	16.1	[15.1–17.0]	1443	20.3	[19.2–21.3]	1140	9.5	[8.5–10.5]	1 137
Asian/Indian	10.9	[5.0–16.8]	330	21.3	[16.7–25.9]	208	11.4	[10.2–12.6]	214
Total	17.4	[16.5–18.4]	3775	17.9	[17.0–18.7]	2785	8.5	[7.8–9.1]	2 731
Total	**17.4**	**[16.5–18.4]**	**3775**	**17.9**	**[17.0–18.7]**	**2785**	**8.5**	**[7.8–9.1]**	**2 731**

95% CI: 95% confidence interval

Table 3.4.1.3.2: Mean age of initiation of other tobacco product use among all participants aged 15 years and older who currently use other tobacco products by sex, age, locality, province and race, South Africa 2012

Background characteristics	Age of initiation of other tobacco product use		
	Mean (years)	95% CI	Total
Sex			
Male	21.5	[20.30–22.78]	530
Female	27.9	[25.54–30.33]	428
Total	23.9	[22.77–25.04]	958
Age			
15–24	16.2	[15.67–16.74]	163
25–34	19.6	[18.48–20.74]	189
35–44	24.1	[22.48–25.80]	164
45–54	27.1	[24.59–29.57]	184
55–64	*	*	70
65+	32.6	[29.41–35.76]	188
Total	23.9	[22.77–25.04]	958
Locality			
Urban formal	23.1	[21.46–24.73]	477
Urban informal	21.9	[20.13–23.76]	124
Rural formal	21.3	[19.78–22.82]	173
Rural informal	28.5	[26.16–30.74]	185
Total	23.9	[22.77–25.04]	959
Province			
Western Cape	19.6	[18.27–20.87]	191
Eastern Cape	26.5	[24.06–28.97]	115
Northern Cape	21.3	[19.37–23.19]	112
Free State	23.2	[22.12–24.26]	163
KwaZulu-Natal	*	*	93
North West	*	*	44
Gauteng	23.3	[20.16–26.46]	106
Mpumalanga	*	*	58
Limpopo	*	*	77
Total	23.9	[22.77–25.04]	959
Race			
African	24.9	[23.65–26.22]	613
White	*	*	25
Coloured	19.6	[18.10–21.16]	291
Asian/Indian	*	*	30
Total	23.9	[22.77–25.04]	959
Total	23.9	[22.77–25.04]	959

95% CI: 95% confidence interval

** Too few observations to report*

The mean age of initiation of the use of other tobacco products was significantly lower for male other tobacco users from urban informal localities (19.4 years) than those from rural informal areas (25 years) (Table 3.4.1.3.3). Males 15–24 years of age reported a significantly lower mean age of initiation of other tobacco products (16.2 years) than those 25–34 years of age, 34–44 years of age, 45–54 years of age, 55–64 years of age and 65 years of age and older.

The mean age of initiation of using other tobacco products was significantly lower for males from the Western Cape (19.5 years) than those from Limpopo (25.6 years).

Table 3.4.1.3.3: Mean age of initiation of other tobacco product use among male participants aged 15 years and older who currently use tobacco by age, locality, province and race, South Africa 2012

Background characteristics	Age of initiation of other tobacco product use		
	Mean	95% CI	Total
Sex			
Male	21.5	[20.3–22.8]	530
Total	21.5	[20.3–22.8]	530
Age			
15–24	16.2	[15.4–16.9]	113
25–34	19.7	[18.4–21.0]	129
35–44	*	*	79
45–54	*	*	91
55–64	*	*	35
65+	*	*	82
Locality			
Urban formal	21.0	[19.3–22.8]	279
Urban informal	*	*	64
Rural formal	20.3	[19.2–21.4]	102
Rural informal*	*	*	85
Province			
Western Cape	19.5	[17.8–21.2]	119
Eastern Cape	*	*	65
Northern Cape	*	*	55
Free State	*	*	66
KwaZulu-Natal	*	*	58
North West	*	*	19
Gauteng	*	*	72
Mpumalanga	*	*	37
Limpopo	*	*	39
Race			
African	21.8	[20.3–23.3]	322
White*			16
Coloured	19.7	[18.0–21.4]	171
Asian/Indian*			21
Total	21.5	[20.3–22.8]	530

95% CI: 95% confidence interval

** Too few observations to report*

Females from formal rural areas who currently use other tobacco products reported a significantly lower mean age of initiation of other tobacco products use (22.9 years) than females from informal rural areas (32.9 years) (Table 3.4.1.3.4). Females 15–24 years of age initiated use of other tobacco products at a significantly lower mean age (16.2 years) when compared to those 25–34 years of age, 25–34 years of age, 35–44 years of age, 45–54 years of age and 65 years of age and older.

Females from the Eastern Cape reported a significantly older age of initiation of using of other tobacco products (34.1 years) than females from the Western Cape (19.7 years), Northern Cape (22 years) and Free State (26.5 years).

The mean number of other tobacco products used per day was 16.0 units. Males reported a higher mean number of other tobacco products used than females: 20.3 units compared to 7.7 units (Table 3.4.1.3.5). Individuals 15–24 years of age reported the highest number of other tobacco products used per day (35.8 units), which was significantly higher than for those 55–64 years of age (3.5 units). Urban formal individuals reported a significantly higher mean number of other tobacco products used per day (17.8 units) compared to those from urban informal localities (5.2 units). Individuals from urban informal localities reported a significantly lower mean number (5.2) of other tobacco products used per day compared to the national mean (16.0 units).

Table 3.4.1.3.4: Mean age of initiation of other tobacco product use among female participants aged 15 years and older who currently use tobacco by age, locality, province and race, South Africa 2012

Background characteristics	Age of initiation of other tobacco product use		
	Mean	95% CI	Total
Sex			
Females	27.9	[25.5–30.3]	428
Total	27.9	[25.5–30.3]	428
Age			
15–24	*	*	50
25–34	*	*	60
35–44	*	*	84
45–54	*	*	93
55–64	*	*	35
65+	37.7	[33.2–42.2]	106
Locality			
Urban formal	27.1	[23.2–30.9]	197
Urban informal	*	*	60
Rural formal	*	*	71
Rural informal	32.9	[29.1–36.8]	100
Race			
African	30.6	[28.4–32.9]	290
White	*	*	9
Coloured	19.5	[16.6–22.4]	120
Asian/Indian	*	*	9
Total	27.9	[25.5–30.3]	428

95% CI: 95% confidence interval

Table 3.4.1.3.5: Number of other tobacco products used per day among all participants by sex, age, locality, province and race, South Africa 2012

Background characteristics	Number (per day)		
	Mean	95% CI	Total
Sex			
Males	20.3	[12.63–27.98]	411
Females	7.7	[1.48–13.81]	310
Total	16.0	[10.20–21.75]	721
Age			
15–24	35.8	[14.98–56.52]	119
25–34	13.4	[2.97–23.82]	140
35–44	11.0	[3.19–18.83]	133
45–54	13.2	[2.12–24.31]	134
55–64	3.5	[2.35–4.65]	110
65+	*	*	86
Total	16.0	[10.20–21.75]	722
Locality			
Urban formal	17.8	[9.08–26.57]	350
Urban informal	*	*	94
Rural formal	12.0	[3.26–20.74]	153
Rural informal	19.0	[5.45–32.56]	125
Total	16.0	[10.20–21.75]	722
Province			
Western Cape	17.2	[4.63–29.78]	156
Eastern Cape	*	*	92
Northern Cape	*	*	99
Free State	10.5	[–4.37–25.34]	123
KwaZulu-Natal	*	*	59
North West	*	*	31
Gauteng	*	*	69
Mpumalanga	*	*	46
Limpopo	*	*	47
Race			
African	15.6	[8.75–22.44]	444
White	*	*	14
Coloured	11.9	[5.92–17.82]	244
Asian/Indian	*	*	19
Total	16.0	[10.20–21.75]	721

95% CI: 95% confidence interval

** Too few observations to record reliably*

3.4.1.4 Blood cotinine levels

Cotinine is the major proximate metabolite of nicotine, the addictive agent in tobacco. Cotinine is widely used as biomarker of exposure to tobacco and both active and second-hand tobacco smoke. As the magnitude of second-hand smoke exposure declines because of proportionately fewer smokers and more bans on smoking in public places, the optimal cotinine cut-off point with which to distinguish smokers from non-smokers is expected to change (Benowitz 2009). The most widely used cut-off point of 14 ng/ml was determined by Jarvis et al. (1987) on the basis of cotinine samples taken from people visiting outpatient clinics in the United Kingdom (UK) in the early 1980s – a time when the UK had few smoke-free indoor regulations. Using data from the US NHANES studies conducted between 1999 and 2004, a new overall cut-off point of 3 ng/ml in adults was proposed (Benowitz 2009) to distinguish smokers from non–smokers.

The correct cut-off point in South Africa is therefore likely to be lower than 14 ng/ml; and in SANHANES-1 the following cut-off points for serum cotinine levels were chosen:
1. < 10 ng/ml for zero tobacco exposure
2. 10–100 ng/ml for environmental tobacco smoke (ETS) exposure or light smoking (2–5 cigarettes a week)
3. 101–300 ng/ml for moderate smokers (3–20 cigarettes a day)
4. > 300 ng/ml for heavy smokers (> 20 cigarettes a day)

As smoking prevalence varies from one province to another (being highest in the Western Cape), and ETS exposure varies from one community to another (for example, from schools to offices), the correct cut-off points will vary according to the different settings (NHO 2013). In addition, racial differences in the rate of metabolism of nicotine and cotinine have been well described (Perez 1998), with slower metabolism of cotinine in adult non-Hispanic black Americans (Benowitz 2009) than in other race groups, resulting in a higher cut-off point for this group. In Americans from the NHANES studies of 1999–2004, average serum cotinine in adult smokers was 122 ng/ml (Benowitz 2009).

In addition, cotinine levels and their interpretation in epidemiological studies of smoking behaviour, are dependent upon, for example, the prevalence of occasional smoking and the underreporting of smoking amongst adolescents, resulting in a lower sensitivity of the cut-off point used in this group compared to adults (Benowitz 2009). Thus, for example, in black African women who often have low levels of tobacco usage, sensitivity of the cut-off points is also likely to be lower. Nevertheless, for the purposes of a population health study such as SANHANES-1 (rather than an individual, clinical study such as a cessation trial), this degree of imprecision is acceptable.

All samples for cotinine levels in individuals older than 10 years of age were analysed by South African National Accreditation System (SANAS) accredited laboratories, and the cut-off points of normality, which comply with international standards, were used.

Nearly two-thirds (62.2%) of individuals had cotinine detected in their blood. One third (32.2%) had cotinine levels of < 10 ng/ml and 29.9% > 10 ng/ml (Table 3.4.1.4.1). Males who had detected in their blood had a significantly higher mean cotinine level (241.3 ng/mI) females (213.1 ng/ml). Individuals 55–65 years of age had the highest mean cotinine level (262 ng/ml), which was significantly higher than for those 15–24 years of age (196.1 ng/ml).

Of individuals from rural formal settings, 46.9% had cotinine levels > 10 ng/ml, which was significantly higher than the 29.9% nationally who had cotinine levels greater > 10 ng/ml.

Table 3.4.1.4.1: Blood cotinine levels among all participants by sex, age, locality, province and race, South Africa 2012

Background characteristics	Cotinine > 10 ng/ml and < 500 ng/ml		Sample	Cotinine not detected		Cotinine < 10 ng/ml		Cotinine > 10 ng/ml		Sample
	Mean	95% CI	N	%	95% CI	%	95% CI	%	95% CI	n
Sex										
Male	241.3	[226.8–255.9]	820	36.3	[30.7–42.4]	28.5	[24.0–33.5]	35.2	[31.7–38.8]	2 159
Female	213.1	[200.5–225.7]	908	39.3	[33.9–44.9]	35.7	[31.2–40.6]	25.0	[22.4–27.7]	3 341
Total	229.6	[218.9–240.4]	1 728	37.8	[33.0–43.0]	32.2	[28.1–36.6]	29.9	[27.5–32.4]	5 500
Age group										
10–14	201	[117.4–284.6]	30	47.2	[38.9–55.8]	50.1	[41.8–58.3]	2.7	[1.6–4.5]	780
15–24	196.1	[173.0–219.3]	367	42.7	[35.9–49.9]	32.9	[27.0–39.5]	24.3	[20.6–28.5]	1 241
25–34	198.3	[181.3–215.4]	312	43.7	[34.5–53.4]	20.9	[16.1–26.7]	35.4	[29.2–42.1]	753
35–44	242.0	[213.1–270.9]	278	37.9	[28.7–48.1]	26.5	[21.1–32.8]	35.6	[28.9–42.8]	711
45–54	243.3	[225.3–261.3]	315	30.7	[23.1–39.4]	27.3	[21.3–34.3]	42.0	[35.5–48.8]	769
55–64	262.0	[225.7–298.4]	238	25.4	[20.1–31.6]	30.4	[24.3–37.4]	44.1	[37.6–50.9]	628
65+	260.5	[236.1–284.9]	176	31.1	[22.2–41.5]	38.0	[30.8–45.7]	30.9	[25.5–36.9]	618
Total	229.8	[218.9–240.8]	1 716	37.8	[33.1–42.8]	32.2	[28.2–36.6]	29.9	[27.6–32.4]	5 500
Locality										
Urban formal	232.5	[216.3–248.6]	905	40.1	[32.6–48.1]	30.0	[24.1–36.6]	29.9	[26.5–33.6]	2 739
Urban informal	195.9	[178.8–212.9]	177	45.6	[33.3–58.4]	26.1	[16.2–39.2]	28.4	[22.7–34.8]	658
Rural formal	246.3	[222.5–270.0]	403	18.5	[8.2–36.6]	34.6	[23.7–47.4]	46.9	[42.1–51.7]	979
Rural informal	229.6	[206.3–252.9]	239	36.2	[26.8–46.9]	38.9	[29.7–48.8]	24.9	[20.8–29.5]	1 124
Total	229.6	[218.9–240.4]	1 724	37.8	[33.0–43.0]	32.2	[28.1–36.6]	29.9	[27.5–32.4]	5 500
Province										
Western Cape	244.5	[228.6–260.5]	456	0.1	[0.0–0.4]	61.8	[56.0–67.3]	38.1	[32.6–43.9]	1 158
Eastern Cape	222.6	[205.4–239.8]	283	3.7	[0.9–13.9]	68.6	[61.6–74.9]	27.6	[23.1–32.6]	1 037
Northern Cape	283.4	[221.8–345.0]	185	0.0		50.0	[36.4–63.7]	50.0	[36.3–63.6]	442
Free State	227.8	[201.6–253.9]	190	0.0		61.3	[53.9–68.2]	38.7	[31.8–46.1]	548
KwaZulu-Natal	173.7	[157.6–189.8]	117	75.8	[68.3–82.0]	0.0		24.2	[18.0–31.7]	541
North West	231.6	[211.8–251.4]	244	0.0		60.7	[54.7–66.5]	39.3	[33.5–45.3]	811
Gauteng	220.2	[190.7–249.7]	139	77.8	[72.4–82.4]	0.0	[0.0–0.4]	22.1	[17.6–27.5]	590
Mpumalanga	259.4	[216.2–302.5]	72	56.3	[46.9–65.2]	0.0		43.7	[34.8–53.1]	189
Limpopo	331.2	[275.4–387.0]	35	77.9	[67.1–85.9]	0.0		22.1	[14.1–32.9]	184
Total	229.6	[218.9–240.4]	1 721	37.8	[33.0–43.0]	32.2	[28.1–36.6]	29.9	[27.5–32.4]	5 500
Race										
African	224.6	[212.1–237.1]	942	43.7	[38.0–49.6]	29.2	[24.3–34.5]	27.1	[24.6–29.7]	3 549
White	225.1	[140.2–309.9]	29	32.7	[11.5–64.4]	44.1	[23.6–66.7]	23.3	[12.2–39.8]	112
Coloured	248.2	[227.9–268.6]	699	3.3	[1.8–6.3]	50.1	[44.4–55.7]	46.6	[41.2–52.0]	1 592
Asian/Indian	206.5	[162.6–250.4]	56	67.4	[57.7–75.7]	3.1	[1.1–8.4]	29.5	[21.5–39.0]	241
Total	229.6	[218.9–240.3]	1 726	37.9	[33.0–43.0]	32.2	[28.1–36.6]	29.9	[27.5–32.4]	5 494

95% CI: 95% confidence interval

Individuals from Limpopo had a significantly higher mean cotinine level (331.2 ng/ml) than the national mean (229.6 ng/ml). Northern Cape had a prevalence of 50% of cotinine levels > 10 ng/ml, which is significantly higher than the national prevalence of 29.9%. Coloured individuals had highest mean cotinine level (248.2 ng/ml), but not significantly higher than any of the other race groups. Furthermore, coloured individuals had a significantly higher prevalence of cotinine levels > 10 ng/ml (46.6%) than the national prevalence.

3.4.1.5 Ex-smokers and ex-other tobacco product users

Past tobacco usage refers to those individuals who reported having quit the use of all tobacco products, also often called quitters.

The mean age of initiation of smoking for ex-smokers 15–24 years of age (13.4 years) and 25–34 years of age (15.8 years) was significantly lower than for ex-smokers aged 35–44 years of age (18.2 years), 45–54 years of age (19.1 years), 55–64 years of age (20.3 years) and 65 years of age and older (23.7 years) (Table 3.4.1.5.1).

The mean age of initiation of other tobacco products use for ex-users of other tobacco products 15–24 years of age (16.2 years) and 25–34 years of age (19.6 years) was significantly lower than for ex-other tobacco products users 35–44 years of age (24.1 years), 45–54 years of age (27.1 years), 55–64 years of age (34.1 years) and 65 years of age and older (35.4 years). The time elapsed since quitting the use of other tobacco products for the groups 15–24 years of age (1.8 years), 25–34 years of age, and 35–44 years of age (7.1) is significantly lower than those 65 years of age and older (22.8 years).

Among ex-tobacco users who used other tobacco products, males started at a significantly younger mean age (21.5 years) than females (27.9 years). Among ex-tobacco users who used other tobacco products, the time elapsed since quitting is significantly higher among Indian individuals (24.3 years) when compared to the national mean (8.6 years) and the mean age of initiation for all other races.

3.4.1.6 Exposure to environmental tobacco smoke

Respondents were asked if anybody smokes in their home. Nationally, 77.5% of the individuals reported that they have never been exposed to ETS in their homes (Table 3.4.1.6.1). However, 17.7% of individuals reported being exposed to ETS on a daily basis in their homes. Daily exposure to ETS is significantly higher for males (20.4%) than for females (15.4%). Individuals 65 years of age and older are least exposed to ETS (13.4%).

The prevalence of exposure to daily ETS in Western Cape was significantly higher (33.4%) than the national level (17.7%). North West reported significantly lower rates of exposure to daily ETS (10.7%) than the national level (17.7%).

The prevalence of exposure to daily ETS by coloured individuals (40.7%) was significantly higher than the national average (17.7%). Coloured individuals reported having a significantly higher rate of exposure to daily ETS (40.7%) than white individuals (16.5%) and black African individuals (14.9%).

Individuals from the Western Cape reported a significantly lower rate of daily exposure to the use of other tobacco products (9.9%) compared to those from Free State (24.7%) (Table 3.4.1.6.2). Black African individuals reported a significantly lower rate of daily exposure to the use of other tobacco products (10.6%) compared to Coloured individuals (15.6%).

Table 3.4.1.5.1: Past tobacco and other tobacco product usage among all participants 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	Past tobacco use							
	Age of initiation		Total	Duration of smoking		Total	Time elapsed since quitting	
	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
Sex								
Males	17.9	[17.2–18.5]	2 388	13.4	[11.2–15.7]	319	13.9	[12.0–15.8]
Females	16.4	[14.4–18.5]	1 398	8.8	[6.5–11.2]	176	11.4	[9.0–13.8]
Total	17.4	[16.5–18.4]	3 786	11.8	[10.0–13.7]	495	12.9	[11.3–14.6]
Age								
15–24	13.4	[12.1–14.6]	725	*	*	*	*	*
25–34	15.8	[14.7–17.0]	817	*	*	*	*	*
35–44	18.2	[17.2–19.3]	674	*	*	*	*	*
45–54	19.1	[17.8–20.4]	729	12.8	[9.7–16.0]	112	13.6	[11.6–15.6]
55–64	20.3	[19.0–21.6]	556	17.7	[14.9–20.5]	112	19.2	[15.6–22.8]
65+	23.7	[19.1–28.3]	284	*	*	*	*	*
Total	17.4	[16.5–18.4]	3 785	11.8	[10.0–13.7]	495	12.9	[11.3–14.6]
Locality								
Urban formal	17.2	[15.9–18.5]	2 384	11.5	[9.0–13.9]	325	13.4	[11.1–15.7]
Urban informal	17.1	[15.7–18.5]	425	*	*	*	*	*
Rural formal	18.4	[17.1–19.8]	505	*	*	*	*	*
Rural informal	18.0	[15.7–20.4]	505	*	*	*	*	*
Total	17.4	[16.5–18.4]	3 819	11.8	[10.0–13.7]	495	12.9	[11.3–14.6]
Province								
Western Cape	14.5	[13.1–16.0]	1 050	16.5	[10.5–22.5]	100	15.6	[12.6–18.6]
Eastern Cape	18.0	[16.0–20.0]	470	*	*	*	*	*
Northern Cape	17.3	[14.8–19.9]	380	*	*	*	*	*
Free State	19.6	[18.6–20.5]	256	*	*	*	*	*
KwaZulu-Natal	16.2	[12.2–20.2]	592	*	*	*	*	*
North West	20.4	[19.0–21.8]	249	*	*	*	*	*
Gauteng	18.4	[16.9–19.9]	452	*	*	*	*	*
Mpumalanga	19.3	[17.5–21.2]	203	*	*	*	*	*
Limpopo	20.4	[18.5–22.2]	167	*	*	*	*	*
Total	17.4	[16.5–18.4]	3 819	*	*	*	*	*
Race								
African	18.1	[17.0–19.2]	1 804	10.4	[8.8–11.9]	257	12.0	[10.3–13.7]
White	18.7	[15.9–21.5]	198	*	*	*	*	*
Coloured	16.1	[15.1–17.0]	1 443	13.6	[11.5–15.7]	139	13.3	[11.4–15.2]
Asian/Indian	10.9	[5.0–16.8]	330	*	*	*	*	*
Total	17.4	[16.5–18.4]	3 775	11.8	[10.0–13.7]	494	12.9	[11.3–14.6]

Ober tobacco products include hand rolled cigarettes, pipes, cigars, cheroots and cigarillos, hookah, hubbly bubbly, water pipe sessions, electronic cigarettes, snuff, chewing tobacco and smokeless tobacco.

95% CI: 95% confidence interval

** Too few observations to report reliably*

Past tobacco product use*									
Total	Age of initiation		Total	Duration of smoking		Total	Time elapse since quiting		Total
n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI	n
277	21.5	[20.3–22.8]	533	*	*	*	*	*	79
178	27.9	[25.5–30.3]	429	*	*	*	*	*	34
455	23.9	[22.8–25.0]	962	10.9	[8.4–13.4]	128	8.6	[5.8–11.4]	113
	16.2	[15.7–16.7]	164	*	*	*	*	*	20
	19.6	[18.5–20.7]	191	*	*	*	*	*	27
	24.1	[22.5–25.8]	165	*	*	*	*	*	18
102	27.1	[24.6–29.6]	184	*	*	*	*	*	17
105	31.4	[28.2–34.6]	144	*	*	*	*	*	21
	35.4	[30.9–39.9]	114	*	*	*	*	*	10
455	23.9	[22.8–25.0]	962	10.9	[8.4–13.4]	128	8.6	[5.8–11.4]	113
295	23.1	[21.5–24.7]	480	*	*	*	*	*	65
	21.9	[20.1–23.8]	124	*	*	*	*	*	15
	21.3	[19.8–22.8]	174	*	*	*	*	*	10
90	28.4	[26.2–30.7]	185	*	*	*	*	*	23
455	23.9	[22.8–25.0]	963	10.9	[8.4–13.4]	128	8.6	[5.8–11.4]	113
96	19.6	[18.3–20.9]	192	9.9	[4.2–15.6]	*	*	*	28
*	26.5	[24.1–29.0]	115	9.9	[4.9–14.8]	*	*	*	13
*	21.3	[19.4–23.2]	113	15.7	[5.8–25.5]	*	*	*	11
*	23.2	[22.1–24.3]	163	14.5	[7.5–21.6]	*	*	*	8
*	24.3	[21.2–27.5]	94	8.4	[5.9–10.8]	*	*	*	12
*	28.4	[24.4–32.4]	44	13.3	[4.0–22.6]	*	*	*	4
*	23.3	[20.2–26.5]	106	8.0	[2.1–13.9]	*	*	*	20
*	24.7	[21.5–27.9]	59	7.9	[1.7–14.2]	*	*	*	7
*	29.0	[25.0–32.9]	77	16.7	[8.2–25.1]	*	*	*	10
*	23.9	[22.8–25.0]	963	10.9	[8.4–13.4]	128	8.6	[5.8–11.4]	113
244	24.9	[23.6–26.2]	613	11.1	[8.2–14.0]	86	10.2	[7.3–13.1]	65
*	*	*	*	*	*	*	*	*	10
121	19.6	[18.1–21.2]	291	7.3	[3.5–11.2]	34	6.2	[4.1–8.3]	34
*	*	*	*	*	*	*	*	*	3
453	23.9	[22.8–25.0]	959	10.9	[8.4–13.4]	127	8.6	[5.8–11.4]	112

Table 3.4.1.6.1: Exposure to ETS inside the home among all participants 15 years of age and older by sex, age, locality, province and race, South Africa 2012

Passive exposure to smoking in the home											
Background characteristics	Daily		Weekly		Monthly and less than monthly		Never		Don't know		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex											
Male	20.4	[18.2–22.7]	1.0	[0.7–1.5]	0.9	[0.6–1.2]	75.1	[72.6–77.5]	2.6	[1.9–3.5]	5 973
Female	15.4	[13.8–17.1]	1.1	[0.8–1.5]	1.1	[0.8–1.6]	79.6	[77.8–81.4]	2.8	[2.1–3.7]	8 596
Total	17.7	[16.0–19.5]	1.1	[0.8–1.4]	1.0	[0.8–1.3]	77.5	[75.6–79.3]	2.7	[2.1–3.5]	14 569
Age											
15–24	17.4	[15.4–19.7]	1.0	[0.7–1.5]	0.7	[0.5–1.1]	78.5	[76.0–80.7]	2.4	[1.7–3.3]	4 148
25–34	16.8	[14.5–19.3]	1.1	[0.6–1.8]	0.8	[0.4–1.3]	77.7	[75.1–80.2]	3.7	[2.7–5.0]	2 891
35–44	18.3	[15.8–21.1]	1.3	[0.7–2.2]	0.9	[0.5–1.6]	76.9	[74.0–79.7]	2.6	[1.8–3.7]	2 389
45–54	20.0	[17.1–23.3]	0.9	[0.5–1.6]	1.1	[0.6–2.0]	76.0	[72.4–79.3]	2.0	[1.2–3.6]	2 161
55–64	20.3	[17.2–23.8]	1.3	[0.7–2.2]	1.0	[0.5–1.8]	74.8	[70.7–78.5]	2.7	[1.8–4.0]	1 637
65+	13.4	[10.6–16.7]	0.8	[0.4–1.5]	2.9	[1.3–6.7]	80.7	[76.6–84.2]	2.2	[1.4–3.4]	1 338
Total	17.7	[16.0–19.5]	1.1	[0.8–1.4]	1.0	[0.8–1.3]	77.5	[75.6–79.3]	2.7	[2.1–3.5]	14 564
Locality											
Urban formal	18.7	[16.2–21.4]	0.8	[0.5–1.2]	1.0	[0.7–1.5]	77.6	[74.8–80.1]	2.0	[1.4–3.0]	7 872
Urban informal	17.5	[13.6–22.2]	1.0	[0.5–1.7]	0.7	[0.3–1.6]	78.0	[73.3–82.1]	2.8	[1.5–5.3]	1 817
Rural formal	22.2	[15.8–30.1]	1.7	[0.7–3.9]	1.0	[0.6–1.7]	71.8	[63.7–78.8]	3.3	[1.2–8.6]	1 778
Rural informal	14.2	[11.7–17.0]	1.6	[1.1–2.4]	1.1	[0.8–1.6]	79.0	[75.9–81.8]	4.1	[2.7–6.0]	3 108
Total	17.7	[16.0–19.5]	1.1	[0.8–1.4]	1.0	[0.8–1.3]	77.5	[75.6–79.3]	2.7	[2.1–3.5]	14 575
Province											
Western Cape	33.4	[27.5–39.8]	1.0	[0.4–2.4]	0.6	[0.3–1.1]	64.4	[58.1–70.2]	0.7	[0.3–1.7]	2 044
Eastern Cape	16.5	[13.1–20.5]	1.0	[0.5–2.2]	1.2	[0.7–2.0]	75.8	[71.1–80.0]	5.5	[3.2–9.2]	1 583
Northern Cape	30.5	[24.1–37.8]	0.5	[0.2–1.3]	0.6	[0.3–1.3]	65.8	[59.3–71.7]	2.6	[1.2–5.5]	970
Free State	25.5	[20.2–31.6]	1.3	[0.4–3.9]	1.3	[0.6–3.0]	70.0	[63.3–75.9]	1.9	[0.8–4.2]	783
KwaZulu-Natal	19.0	[14.8–24.1]	2.0	[1.2–3.5]	1.3	[0.6–3.2]	75.6	[70.2–80.4]	2.0	[1.1–3.3]	2 338
North West	10.7	[7.8–14.4]	1.7	[0.8–3.6]	1.3	[0.8–2.0]	80.4	[76.1–84.0]	6.0	[3.7–9.6]	1 785
Gauteng	13.3	[10.2–17.3]	0.4	[0.1–0.9]	0.8	[0.5–1.3]	83.6	[79.8–86.8]	1.9	[0.9–3.7]	2 562
Mpumalanga	13.7	[10.1–18.3]	0.9	[0.5–1.5]	1.2	[0.5–2.7]	78.8	[72.3–84.0]	5.5	[2.4–12.4]	1 296
Limpopo	16.5	[12.1–22.0]	1.7	[0.9–3.0]	0.9	[0.5–1.8]	79.1	[73.4–83.9]	1.8	[1.0–3.2]	1 214
Total	17.7	[16.0–19.5]	1.1	[0.8–1.4]	1.0	[0.8–1.3]	77.5	[75.6–79.3]	2.7	[2.1–3.5]	14 575
Race											
African	14.9	[13.1–16.8]	1.2	[0.9–1.6]	1.0	[0.8–1.3]	79.8	[77.7–81.7]	3.2	[2.5–4.2]	9 745
White	16.5	[11.9–22.2]	0.5	[0.1–3.3]	1.6	[0.6–4.6]	80.8	[74.8–85.7]	0.6	[0.2–1.6]	668
Coloured	40.7	[35.6–45.9]	1.0	[0.4–2.3]	0.4	[0.2–0.7]	56.9	[51.6–62.0]	1.1	[0.6–1.9]	2 912
Asian/Indian	30.3	[19.3–44.0]	0.4	[0.2–0.8]	1.0	[0.5–2.1]	66.7	[53.4–77.8]	1.7	[0.8–3.4]	1 199
Total	17.7	[16.0–19.5]	1.1	[0.8–1.4]	1.0	[0.8–1.3]	77.5	[75.6–79.3]	2.7	[2.1–3.5]	14 524

95% CI: 95% confidence interval

Table 3.4.1.6.2: Exposure to use of other tobacco inside the home among all participants by sex, age, locality, province and race, South Africa 2012

Background Characteristics	Exposure to other tobacco products*										
	Daily		Weekly		Monthly and less than monthly		Never		Don't know		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex											
Male	11.7	[10.0–13.6]	1.2	[0.9–1.8]	0.6	[0.4–1.0]	83.2	[81.1–85.1]	3.3	[2.5–4.3]	6 047
Female	9.7	[8.6–11.1]	1.1	[0.8–1.6]	0.6	[0.3–1.0]	85.3	[83.7–86.7]	3.3	[2.6–4.1]	8 616
Total	10.7	[9.3–12.1]	1.2	[0.9–1.5]	0.6	[0.4–0.8]	84.3	[82.7–85.8]	3.3	[2.6–4.1]	14 663
Age											
15–24	11.6	[9.9–13.5]	1.2	[0.8–1.9]	0.5	[0.3–0.9]	83.8	[81.8–85.6]	2.9	[2.2–3.8]	4 140
25–34	10.2	[8.5–12.3]	1.1	[0.7–2.0]	1.0	[0.5–1.9]	84.0	[81.6–86.1]	3.7	[2.7–5.0]	2 911
35–44	9.1	[7.2–11.5]	1.4	[0.9–2.2]	0.4	[0.2–0.8]	85.8	[83.3–88.0]	3.3	[2.3–4.7]	2 432
45–54	11.3	[9.5–13.6]	1.0	[0.6–1.7]	0.5	[0.2–1.3]	83.9	[81.1–86.4]	3.2	[2.1–5.0]	2 190
55–64	13.0	[10.7–15.7]	1.4	[0.8–2.4]	0.4	[0.2–0.8]	82.4	[79.4–85.1]	2.8	[1.9–4.2]	1 657
65+	8.8	[6.7–11.6]	0.4	[0.2–0.9]	0.5	[0.1–2.5]	86.1	[83.0–88.8]	4.2	[2.9–5.9]	1 329
Total	10.7	[9.3–12.1]	1.2	[0.9–1.5]	0.6	[0.4–0.8]	84.3	[82.7–85.8]	3.3	[2.6–4.1]	14 659
Locality											
Urban formal	11.0	[9.0–13.2]	1.0	[0.6–1.5]	0.5	[0.3–0.9]	84.9	[82.6–87.0]	2.7	[1.9–3.7]	7 918
Urban informal	11.4	[8.1–15.7]	1.1	[0.6–2.2]	0.6	[0.3–1.4]	84.2	[79.6–87.8]	2.7	[1.4–5.0]	1 833
Rural formal	11.8	[8.2–16.8]	1.7	[0.8–3.8]	0.4	[0.2–0.8]	82.7	[76.4–87.6]	3.4	[1.3–8.5]	1 795
Rural informal	9.3	[7.4–11.7]	1.5	[1.0–2.2]	0.8	[0.5–1.3]	83.4	[80.2–86.2]	4.9	[3.5–6.8]	3 123
Total	10.7	[9.3–12.1]	1.2	[0.9–1.5]	0.6	[0.4–0.8]	84.3	[82.7–85.8]	3.3	[2.6–4.1]	14 669
Province											
Western Cape	9.9	[7.4–13.1]	1.2	[0.4–4.2]	0.3	[0.1–0.7]	87.2	[83.7–90.1]	1.4	[0.7–2.8]	2 081
Eastern Cape	8.2	[5.9–11.3]	1.0	[0.5–2.0]	0.8	[0.4–1.5]	84.7	[79.7–88.7]	5.4	[3.2–8.9]	1 599
Northern Cape	17.2	[11.8–24.5]	0.7	[0.3–1.7]	0.4	[0.1–1.2]	78.7	[71.3–84.6]	3.0	[1.5–5.8]	957
Free State	24.7	[20.1–30.0]	2.2	[0.9–5.4]	0.2	[0.0–1.3]	69.4	[64.5–73.9]	3.4	[1.9–6.3]	791
KwaZulu-Natal	8.9	[6.6–11.8]	1.0	[0.6–1.9]	0.6	[0.3–1.4]	87.4	[83.8–90.2]	2.1	[1.2–3.6]	2 378
North West	9.4	[6.5–13.2]	1.8	[1.0–3.4]	0.5	[0.2–0.9]	82.4	[78.1–86.0]	5.9	[3.7–9.4]	1 816
Gauteng	10	[7.1–13.8]	0.8	[0.5–1.5]	0.7	[0.3–1.4]	85.7	[82.0–88.8]	2.8	[1.7–4.6]	2 567
Mpumalanga	8.6	[5.9–12.4]	0.7	[0.3–1.5]	0.7	[0.3–1.5]	84.8	[78.1–89.7]	5.3	[2.2–12.1]	1 286
Limpopo	13.5	[9.6–18.6]	1.9	[1.0–3.6]	0.6	[0.3–1.5]	80.9	[74.9–85.7]	3.1	[2.0–4.8]	1 194
Total	10.7	[9.3–12.1]	1.2	[0.9–1.5]	0.6	[0.4–0.8]	84.3	[82.7–85.8]	3.3	[2.6–4.1]	14 669
Race											
African	10.6	[9.0–12.4]	1.2	[0.9–1.6]	0.7	[0.4–1.0]	83.7	[81.8–85.4]	3.9	[3.1–4.8]	9 785
White	6.9	[4.5–10.6]	1.3	[0.3–5.1]	0.0	[0.0–0.3]	90.7	[86.3–93.7]	1.1	[0.4–2.8]	669
Coloured	15.6	[12.5–19.3]	0.6	[0.4–1.0]	0.8	[0.4–1.5]	81.6	[77.9–84.8]	1.4	[0.9–2.2]	2 944
Asian/Indian	11.4	[8.0–15.8]	0.3	[0.1–1.0]	0.2	[0.1–0.6]	86.6	[81.7–90.3]	1.6	[0.7–3.4]	1 222
Total	10.7	[9.3–12.1]	1.2	[0.9–1.5]	0.6	[0.4–0.8]	84.3	[82.7–85.8]	3.3	[2.6–4.1]	14 620

** Other tobacco products include hand-rolled cigarettes, pipes, cigars, cheroots, cigarillos, hookah, hubbly bubbly, water pipe sessions, electronic cigarettes, snuff, chewing tobacco and smokeless tobacco.*

95% CI: 95% confidence interval

3.4.1.7 Smoking cessation patterns

Current smokers were asked whether a doctor or health care provider had recommended that they quit using tobacco. They were also asked whether they tried to quit, and if the warning labels on cigarette packages had made them think about quitting. Among current smokers, 28.8% reported that they have been advised to quit using tobacco products, 48.1% had tried to quit, and 49.4% reported that the warning labels made them think about quitting (Table 3.4.1.7.1).

Results of whether a doctor or health care provider had advised respondents to quit smoking are tabulated by sex, age, locality, province, and race.

Among those individuals who were advised to quit, females reported a significantly higher rate (38.7%) than males (26.1%). With higher age groups, the percentage of people who reported being advised to quit by their doctors or health care practitioners increased. The youngest age group, 15–24 years of age, reported a significantly lower rate of being advised to quit using tobacco at 13.8% compared to the national average of 28.8%.

In terms of locality, individuals from urban formal settings reported the highest rate (32%) of being advised to quit using tobacco. Individuals from urban formal settings reported a significantly higher rate of being advised to quit using tobacco (32%) compared to those from urban informal settings (21.5%). North West reported the highest rate of individuals that were advised to quit smoking (38%) and Mpumalanga reported the lowest rate (18%). Western Cape had a significantly higher rate (35.3%) of individuals being advised to quit compared to Free State (21.5%), Mpumalanga (18%) and Limpopo (20.9%). Individuals from the Indian population reported the highest rate (51.7%) of being advised to quit using tobacco. Individuals from the black African population had the lowest rate (24.9%) of being advised to quit using tobacco.

Individuals from rural formal settings reported a significantly lower rate (34.7%) of trying to quit smoking compared to the national average (48.1%) (Table 3.4.1.7.2). Individuals from rural formal settings reported a significantly lower rate (34.7%) of trying to quit smoking compared to those from urban formal (49.9%) and urban informal (56.9%) settings.

Northern Cape had the highest rate (61.6%) of reporting that cigarette warning labels encouraged smokers to think about quitting while Limpopo had the lowest rate 36.5% (Table 3.4.1.7.3). Northern Cape reported a significantly higher rate that cigarette warning labels encouraged smokers to think about quitting (61.6%) compared to the national average (49.4%).

Table 3.4.1.7.1: Advised to quit smoking by doctor or health care provider among all participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	Advised to quit		Not advised		Total
	%	95% CI	%	95% CI	n
Sex					
Male	26.1	[23.0–29.5]	73.9	[70.5–77.0]	1 817
Female	38.7	[33.5–44.1]	61.3	[55.9–66.5]	896
Total	28.8	[26.0–31.8]	71.2	[68.2–74.0]	2 713
Age					
15–24	13.8	[10.0–18.7]	86.2	[81.3–90.0]	508
25–34	24.0	[19.8–28.7]	76.0	[71.3–80.2]	620
35–44	30.2	[24.1–37.0]	69.8	[63.0–75.9]	515
45–54	36.1	[28.9–44.0]	63.9	[56.0–71.1]	523
55–64	41.5	[34.8–48.4]	58.5	[51.6–65.2]	379
65+	51.8	[38.9–64.4]	48.2	[35.6–61.1]	166
Total	28.8	[26.0–31.8]	71.2	[68.2–74.0]	2 711
Locality					
Urban formal	32.0	[27.9–36.3]	68.0	[63.7–72.1]	1 683
Urban informal	21.5	[16.5–27.6]	78.5	[72.4–83.5]	306
Rural formal	25.0	[19.4–31.6]	75.0	[68.4–80.6]	426
Rural informal	23.9	[18.8–29.8]	76.1	[70.2–81.2]	299
Total	28.8	[26.0–31.8]	71.2	[68.2–74.0]	2 714
Province					
Western Cape	35.3	[31.2–39.6]	64.7	[60.4–68.8]	761
Eastern Cape	28.6	[22.0–36.3]	71.4	[63.7–78.0]	306
Northern Cape	30.0	[23.1–38.0]	70.0	[62.0–76.9]	325
Free State	21.5	[15.1–29.8]	78.5	[70.2–84.9]	192
KwaZulu-Natal	31.0	[21.4–42.6]	69.0	[57.4–78.6]	367
North West	38.0	[31.6–45.0]	62.0	[55.0–68.4]	183
Gauteng	25.9	[19.3–33.8]	74.1	[66.2–80.7]	296
Mpumalanga	18.0	[9.8–30.9]	82.0	[69.1–90.2]	149
Limpopo	20.9	[13.9–30.1]	79.1	[69.9–86.1]	135
Total	28.8	[26.0–31.8]	71.2	[68.2–74.0]	2 714
Race					
African	24.9	[21.6–28.5]	75.1	[71.5–78.4]	1 244
White	33.6	[23.6–45.3]	66.4	[54.7–76.4]	126
Coloured	35.1	[31.8–38.6]	64.9	[61.4–68.2]	1 121
Asian/Indian	51.7	[27.6–75.0]	48.3	[25.0–72.4]	215
Total	28.8	[26.0–31.8]	71.2	[68.2–74.0]	2 706
Total	**28.8**	**[26.0–31.8]**	**71.2**	**[68.2–74.0]**	**2 714**

95% CI: 95% confidence interval

Smoking cessation pattern: tried to quit smoking

Table 3.4.1.7.2: Cessation amongst current smokers by sex, age, locality, province and race, South Africa 2012

Background characteristics	Tried to quit		Have not tried to quit		Total
	%	95% CI	%	95% CI	n
Sex					
Male	47.4	[44.1–50.8]	52.6	[49.2–55.9]	1 842
Female	50.4	[44.8–55.9]	49.6	[44.1–55.2]	892
Total	48.1	[45.1–51.0]	51.9	[49.0–54.9]	2 734
Age					
15–24	44.6	[37.7–51.7]	55.4	[48.3–62.3]	518
25–34	46.9	[41.7–52.2]	53.1	[47.8–58.3]	627
35–44	47.8	[41.3–54.4]	52.2	[45.6–58.7]	516
45–54	52.8	[45.7–59.8]	47.2	[40.2–54.3]	527
55–64	48.6	[41.3–56.0]	51.4	[44.0–58.7]	378
65+	50.8	[36.3–65.3]	49.2	[34.7–63.7]	166
Total	48.1	[45.1–51.0]	51.9	[49.0–54.9]	2 732
Locality					
Urban formal	49.9	[46.1–53.6]	50.1	[46.4–53.9]	1 688
Urban informal	56.9	[48.8–64.6]	43.1	[35.4–51.2]	315
Rural formal	34.7	[28.1–42.1]	65.3	[57.9–71.9]	424
Rural informal	44.9	[37.3–52.6]	55.1	[47.4–62.7]	308
Total	48.1	[45.1–51.0]	51.9	[49.0–54.9]	2 735
Province					
Western Cape	49.3	[44.1–54.6]	50.7	[45.4–55.9]	759
Eastern Cape	54.4	[48.2–60.6]	45.6	[39.4–51.8]	307
Northern Cape	40.6	[30.8–51.1]	59.4	[48.9–69.2]	324
Free State	54.9	[47.9–61.7]	45.1	[38.3–52.1]	192
KwaZulu-Natal	54.2	[46.3–61.9]	45.8	[38.1–53.7]	377
North West	42.6	[35.5–49.9]	57.4	[50.1–64.5]	184
Gauteng	43.4	[36.4–50.8]	56.6	[49.2–63.6]	300
Mpumalanga	42.7	[28.7–58.0]	57.3	[42.0–71.3]	154
Limpopo	39.6	[28.1–52.3]	60.4	[47.7–71.9]	138
Total	48.1	[45.1–51.0]	51.9	[49.0–54.9]	2 735
Race					
African	48.0	[44.1–51.9]	52.0	[48.1–55.9]	1 266
White	47.7	[37.0–58.7]	52.3	[41.3–63.0]	125
Coloured	47.8	[43.4–52.3]	52.2	[47.7–56.6]	1 123
Asian/Indian	52.3	[46.0–58.5]	47.7	[41.5–54.0]	214
Total	48.1	[45.1–51.0]	51.9	[49.0–54.9]	2 728
Total	48.1	[45.1–51.0]	51.9	[49.0–54.9]	2 735

95% CI: 95% confidence interval

Effects of warning labels on smoking cessation

Table 3.4.1.7.3: Cessation attempts prompted by health warning labels among all participants by sex, age, locality, province and race, South Africa 2012

Background characteristics	Warning labels led you to think about quitting smoking				Total
	Yes		No		
	%	95% CI	%	95% CI	n
Sex					
Male	50.3	[46.6–53.9]	49.7	[46.1–53.4]	1 789
Female	46.5	[40.9–52.2]	53.5	[47.8–59.1]	877
Total	49.4	[46.3–52.6]	50.6	[47.4–53.7]	2 666
Age					
15–24	50.1	[44.4–55.9]	49.9	[44.1–55.6]	508
25–34	51.2	[46.0–56.5]	48.8	[43.5–54.0]	610
35–44	44.6	[38.3–51.2]	55.4	[48.8–61.7]	502
45–54	56.0	[48.7–63.0]	44.0	[37.0–51.3]	516
55–64	45.4	[37.6–53.4]	54.6	[46.6–62.4]	366
65+	46.2	[32.3–60.6]	53.8	[39.4–67.7]	162
Total	49.4	[46.3–52.6]	50.6	[47.4–53.7]	2 664
Locality					
Urban formal	48.8	[44.4–53.4]	51.2	[46.6–55.6]	1 641
Urban informal	56.4	[49.1–63.5]	43.6	[36.5–50.9]	307
Rural formal	44.9	[36.7–53.4]	55.1	[46.6–63.3]	419
Rural informal	50.4	[45.0–55.7]	49.6	[44.3–55.0]	300
Total	49.4	[46.3–52.6]	50.6	[47.4–53.7]	2 667
Province					
Western Cape	47.1	[41.4–52.9]	52.9	[47.1–58.6]	757
Eastern Cape	58.7	[49.4–67.5]	41.3	[32.5–50.6]	299
Northern Cape	61.6	[55.5–67.4]	38.4	[32.6–44.5]	314
Free State	47.2	[40.0–54.4]	52.8	[45.6–60.0]	190
KwaZulu-Natal	58.9	[51.9–65.6]	41.1	[34.4–48.1]	365
North West	49.5	[42.5–56.6]	50.5	[43.4–57.5]	181
Gauteng	43.9	[35.4–52.7]	56.1	[47.3–64.6]	283
Mpumalanga	45.8	[30.5–61.9]	54.2	[38.1–69.5]	144
Limpopo	36.5	[29.0–44.8]	63.5	[55.2–71.0]	134
Total	49.4	[46.3–52.6]	50.6	[47.4–53.7]	2 667
Race					
African	51.1	[46.9–55.3]	48.9	[44.7–53.1]	1 226
White	38.0	[27.5–49.8]	62.0	[50.2–72.5]	124
Coloured	49.0	[44.2–53.8]	51.0	[46.2–55.8]	1 105
Asian/Indian	51.2	[44.7–57.7]	48.8	[42.3–55.3]	204
Total	49.4	[46.3–52.6]	50.6	[47.4–53.7]	2 659
Total	49.4	[46.3–52.6]	50.6	[47.4–53.7]	2 667

95% CI: 95% confidence interval

Discussion

SANHANES-1 is the first nationally representative bio-behavioural study of tobacco product use in South Africa. As a surveillance study, it is critically important in informing government policy on tobacco control. The study collected self-reported data on tobacco use amongst 15 283 South Africans of all ages, as well as biomedical data on serum cotinine levels amongst a nested group within the larger group.

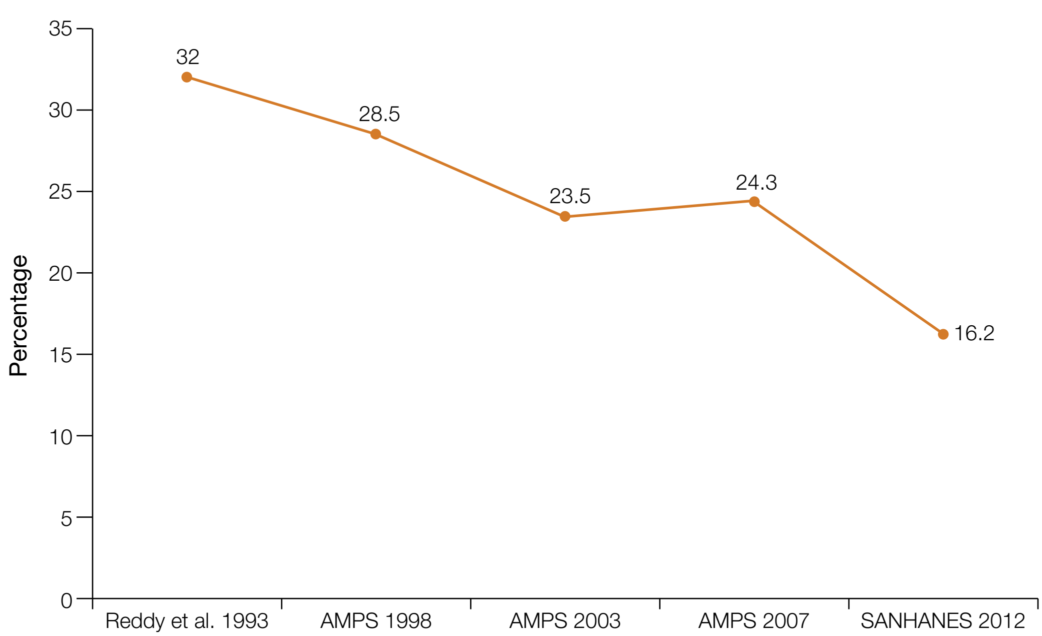
Over the past 20 years, the South African Government has implemented comprehensive tobacco control legislation (Reddy et al. 2013) (Government Gazette 2009; Government Gazette Feb. 2008). Additionally, at an international level, South Africa played a leading role, together with countries such as Brazil, in promoting the development of the WHO Framework Control on Tobacco Control (FCTC), of which South Africa and Brazil were the first signatories among the 175 countries that have since ratified the treaty.

SANHANES-1 has contributed to the evidence that South Africa's comprehensive tobacco control strategy has been effective in reducing smoking prevalence and per capita tobacco consumption. This is evident in data from the All Media and Products Survey (AMPS) and SANHANES-1 (Figure 3.4.1.8.1).

Since the legislation was promulgated, there has been a progressive decline in smoking amongst school going youth from 23.0% in 1999 to 16.9% in 2011 – a 25% reduction over a 12-year period. Public health interventions have led to a decrease in tobacco consumption over the past 20 years, due to changes at the social level, specifically in attitudes towards smoking (Reddy et al. 2013).

Tobacco prevalence in nationally representative studies is usually measured by self-reporting. SANHANES-1 has made a unique contribution because it is a bio-behavioural survey, in which self-report prevalence data can be validated by a biomedical

Figure 3.4.1.8.1: Decline in tobacco smoking over 20 years



measure of tobacco exposure: serum cotinine levels. SANHANES 2012 sampled blood cotinine levels amongst a nested subset of 5 500 adults within the larger cohort of 15 283. These results showed that though current smoking prevalence was 16.2%, exposure to environmental tobacco smoke (ETS) revealed by blood cotinine levels greater than 10 ng/ml was 29.9%. Yet only 17.7% of individuals reported being exposed to ETS on a daily basis in the home, suggesting that they had inhaled ETS without being aware of it. This occurs despite prohibitions on smoking in public places, and indicates that children, women and men are being exposed to ETS within the home. According to WHO, 10% of the six million tobacco-attributable deaths in the world every year are caused by ETS. SANHANES-1 suggests that there may be considerable morbidity and mortality from ETS in South Africa (WHO World Tobacco Report 2011). This justifies the South African Government legislation banning smoking in a car when a child less than 12 years old is riding in the vehicle.

SANHANES-1 found cotinine levels of > 10 ng/ml in 35.2% of men and in 25% of women. Males had significantly higher levels of cotinine measured in their blood (mean 241.3 ng/ml) than females (213.1 ng/ml), commensurate with the higher prevalence of smoking amongst men than amongst women, and the higher per capita consumption of tobacco amongst male smokers.

A high proportion of children 10–14 years of age had cotinine detectable in their blood, though these were primarily at levels below 10 ng/ml. Adoption of smoke-free public places policy has significantly reduced exposure of non-smokers to tobacco smoke inhalation in work and public places. But non-smokers, including children, who live in households where there are smokers, remain at risk of exposure to environmental tobacco smoke (ETS).

Among non-smoking adults ETS causes heart disease and lung cancer while in children ETS causes sudden infant death syndrome, acute respiratory infections, middle ear disease, exacerbated asthma, respiratory symptoms and decreased lung function.

The mean age of initiation of smoking tobacco for males is significantly lower than that of females (17.9 compared to 16.4 years of age). Also, the mean age of initiation of using other tobacco products is lower for males than females (21.5 compared to 27.9 years of age). The mean number of other tobacco products used per day is significantly higher for males than females (20.3 compared to 7.7). This is supported by the results since males smoke on a daily basis at a much higher rate than females (76.1% compared to 62%); and smoke on an occasional basis at the same rate as females (8.4% compared to 8.5%).

Gender differences also persist for the use of other tobacco products: 60.4% of males use other tobacco products daily compared to 63.6% of females. The reason could be because tobacco use is more socially acceptable among males than females, and because males are more likely than females to be employed and have the disposable income to buy tobacco products. Women also received advice to quit smoking much more often than men, perhaps because doctors advise pregnant women to stop smoking.

Smoking and the use of other tobacco products increases with age up to the group in the range 55–64 years of age, and then decreases beyond the age of 65 years.

SANHANES 2012 demonstrated that with each successive generation, individuals begin smoking at a younger age. This implies that the strategies of the global tobacco industry to recruit smokers in adolescence are bearing fruit. This data suggests that public health prevention and cessation efforts should focus on the youth.

Considerable diversity exists in smoking rates between provinces and between ethnic groups. The variation in tobacco use between the provinces may reflect sociocultural and demographic factors. For example, very high smoking rates exist amongst coloured people, who comprise a higher percentage of the Western Cape and the Northern Cape populations.

The sociocultural and geographic differences in tobacco use and prevalence suggest that tailored, culture and context specific interventions need to be designed for smoking prevention and cessation as South Africa is much less culturally homogenous than, for example, Scandinavian countries. In South Africa, ethnicity is often taken as a proxy for household income; whereas much of the differences in tobacco use ascribed to ethnicity may actually reflect variation in living standard measures.

In African society traditionally women did not smoke, except for the pipe smoked by older women in rural areas. This is seen in the much lower rates of tobacco use in women noted in SANHANES-1. This pattern is changing however, and the GYTS studies have shown increasing smoking rates amongst girls.

The persistent rates of smoking seen in SANHANES-1 amongst young people and girls, despite the tobacco control legislation and responsible public health policy of the past 20 years, suggest that the strategies the tobacco industry uses to encourage young people (particularly girls) to smoke are successful. These include secret parties organised by the industry for students, product placement in movies and music videos, and appealing to the naturally rebellious nature of adolescents by emphasising their power to choose whether to smoke or not. Repeated SANHANES-1 studies will be needed, together with GYTS studies, to plot these patterns of tobacco use over time; and gauge the success of prevention and cessation programmes in the population at large. Such continuing surveillance is also needed to assist in the development of continually new strategies for tobacco prevention and health promotion as the industry continually adapts its marketing strategies to circumvent tobacco control legislation.

Among current smokers, 28.8% reported that they have been advised to quit the use of tobacco products – a surprisingly low percentage, suggesting that health professionals are not doing their duty in terms of advising their patients to quit using tobacco products.

Of current smokers, 48.1% had tried to quit and 49.4% reported that the health warning labels on cigarette packs made them think about quitting.

Through SANHANES-1, South Africa now has comprehensive data on tobacco use, and the impact of tobacco control measures – data that can be compared with data from other LMICs as they progressively implement comprehensive tobacco control. This is particularly useful now that LMICs are aligning their tobacco control efforts with the FCTC, using methods drawn from WHO's 'MPOWER' strategy. This begins to address a glaring deficiency of global public health which is the lack of a transnational coordination in tobacco control when faced with an industry that is transnational in structure and marketing methods.

Brazil has had similar success to South Africa over the past 20 years in tobacco control. Per capita cigarette consumption in Brazil from 1980 to 2000 declined by 55% from 1 895 cigarette sticks per capita in 1980 to 858 sticks in 2000. In South Africa, per capita consumption amongst people 15 years of age and older decreased by 54% between 1991 and 2004 following very slight decreases in cigarette consumption throughout the 1980s.

In Brazil excise duty on cigarettes is 41.25% (compared to 50% in South Africa) and sales tax is 25%. Brazil has a whole raft of anti-tobacco provisions, similar to those in place in South Africa. In Brazil age-standardised mortality rates for lung cancer (which is 90% attributable to tobacco) were 56.1 per 100 000 for men and 17.0 for women in 1995 compared to the South African figures of 24.3 per 100 000 persons in 1995, and 23.8 per 100 000 persons in 2006. These figures are high for both countries, and surveillance systems such as SANHANES-1 can be used to follow these sequelae of the tobacco epidemic as time unfolds, particularly in South Africa were smoking status is recorded a death certificate.

In Nigeria, the 2012 Global Adult Tobacco Survey (GATS) showed that 10.0% of men, 1.1% of women, and 5.6% overall (4.5 million adults) currently used tobacco products. African countries can use SANHANES-1, DHS and GAT surveys to monitor their success in implementing comprehensive tobacco control programmes.

Regular SANHANES-1 studies can be used to inform government on the health education messages it needs to revise in schools and the general media; and what further legislation is needed to protect young people, and girls in particular from the harmful effects of tobacco.

3.4.2 Physical activity

In this section of the report, the fitness characteristics of the participants is described.

Cardiovascular fitness of adults 18–40 years of age

Globally, physical inactivity is recognised as the fourth leading risk factor of mortality and it is responsible for 6% of NCD risk such as coronary heart disease, type 2 diabetes, breast cancer and colon cancer. It is estimated that currently six out of ten deaths are attributable to physical inactivity and NCDs are responsible for nearly half of the overall global burden of disease (Lee, ShiromaLobelo et al. 2012, WHO 2010).

Physical inactivity, while recognised globally as a major risk factor in the morbidity and mortality resulting from NCDs would appear to be insuffiently appreciated in both developing and developed countries. Research data on the magnitude and impact of physical inactivity and cardiovascular fitness in subSaharan Africa, including South Africa remains sparse (Lambert & Kolbe-Alexander 2005; Mbanya, Motala, Sobngwi 2010; Dalal, Beunza, Volmink et al. 2011).

Results

Significantly, almost two-thirds of male participants (62.4%) were found to be physically fit compared to 27.9% of males tested who were unfit (Table 3.4.2.1). On the other hand, only 42% of female participants were found to be physically fit and this did not differ significantly from those tested who were unfit (45.2%) (Table 3.4.2.2). More than 57% of male participants in each age group 18–24 years of age (65.9%), 25–29 years of age (61.9%;) and 30–40 years of age (57.1%) were found to be physically fit. However, a notable but statistically insignificant reversal of this trend was found among all female participants where 38% of those 18–24 years of age who tested to be fit increased to 45.8% in those 25–29 years of age and 45.0% in those 30–40 years of age. In summary, therefore, one out of four males (27.9%) and one out of two females (45.2%) were unfit.

The majority of female participants living in urban informal settlements (51.4%) had a significantly better cardiovascular fitness compared to those who were found to be fit (33.9%) from formal urban settlements. Among female participants from urban formal localities, a significant majority (52.9%) tested to be unfit. On the other hand, a significant majority of female participants from rural informal localities (50.7%) tested to be fit, a finding that perhaps attests to the higher level of activity normally required in rural areas and the fact that most of these activities are usually carried out by females. A significant majority of male participants from the urban formal (57.2%) and urban informal (74.6%) localities, tested to be fit. Similarly, a significant majority of male participants from rural informal (66.1%) and rural formal (70.5%) localities were found to be fit.

Table 3.4.2.1: Cardiovascular fitness among male participants 18–40 years of age by age, locality, province and race, South Africa 2012

Background characteristics	Fit		Average		Unfit		Sample
	%	95% CI	%	95% CI	%	95% CI	n
Age group							
18–24	65.9	[59.2–72.1]	7.9	[5.6–11.2]	26.1	[20.5–32.6]	425
25–29	61.9	[48.3–73.9]	6.1	[3.5–10.5]	32.0	[20.4–46.3]	186
30–40	57.1	[47.4–66.3]	15.0	[9.8–22.2]	27.9	[21.0–36.1]	306
Total	62.4	[57.1–67.4]	9.7	[7.5–12.6]	27.9	[23.6–32.6]	917
Locality							
Urban formal	57.2	[49.2–64.9]	9.3	[6.2–13.6]	33.5	[27.1–40.6]	434
Urban informal	74.6	[62.1–84.1]	7.4	[4.1–13.2]	17.9	[10.3–29.4]	133
Rural formal	70.5	[59.6–79.4]	11.3	[6.5–19.0]	18.2	[11.4–27.8]	149
Rural informal	66.1	[57.6–73.7]	11.2	[6.8–18.0]	22.6	[16.3–30.6]	201
Total	62.4	[57.1–67.4]	9.7	[7.5–12.6]	27.9	[23.6–32.6]	917
Province							
Western Cape	56.6	[42.8–69.5]	7.9	[4.1–14.5]	35.5	[24.7–48.0]	145
Eastern Cape	48.6	[38.5–58.9]	17.6	[9.9–29.4]	33.8	[24.9–44.1]	145
Northern Cape	30.8	[14.7–53.6]	23.2	[8.3–50.1]	46.0	[22.4–71.6]	35
Free State	73.5	[59.4–84.0]	8.1	[2.5–23.6]	18.4	[11.2–28.7]	71
KwaZulu-Natal	69.2	[57.1–79.1]	5.3	[2.5–11.0]	25.5	[16.1–38.0]	136
North West	60.7	[43.6–75.5]	11.2	[4.9–23.8]	28.1	[15.3–45.8]	87
Gauteng	58.1	[44.8–70.3]	10.2	[5.6–17.8]	31.7	[21.9–43.5]	115
Mpumalanga	82.5	[71.0–90.1]	6.6	[3.4–12.2]	10.9	[5.9–19.4]	111
Limpopo	70.7	[57.2–81.4]	9.8	[4.9–18.5]	19.5	[10.9–32.5]	72
Total	62.4	[57.1–67.4]	9.7	[7.5–12.6]	27.9	[23.6–32.6]	917
Race							
African	64.6	[58.7–70.1]	10.0	[7.3–13.4]	25.4	[20.7–30.9]	663
White	*	*	*	*	*	*	12
Coloured	50.6	[41.1–60.0]	11.6	[7.5–17.5]	37.8	[29.3–47.2]	182
Asian/Indian	*	*	*	*	*	*	29
Total	62	[56.7–67.0]	9.8	[7.5–12.7]	28.2	[23.9–33.0]	886

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.4.2.2: Cardiovascular fitness among female participants 18–40 years of age by age, locality, province and race, South Africa 2012

Background characteristics	Fit		Average		Unfit		Sample
	%	95% CI	%	95% CI	%	95% CI	n
Age group							
18–24	38.0	[32.0–44.4]	11.8	[8.0–17.0]	50.2	[44.0–56.5]	643
25–29	45.8	[37.9–53.8]	10.9	[6.9–16.8]	43.3	[35.1–52.0]	333
30–40	45.0	[38.6–51.6]	15.3	[11.5–20.0]	39.7	[33.9–45.9]	548
Total	42.0	[37.6–46.7]	12.8	[10.5–15.6]	45.2	[40.4–50.0]	1 524
Locality							
Urban formal	33.9	[27.5–41.0]	13.2	[9.6–17.9]	52.9	[45.2–60.4]	710
Urban informal	51.4	[40.5–62.2]	13.8	[8.6–21.3]	34.8	[24.5–46.6]	237
Rural formal	47.3	[35.2–59.8]	11.2	[7.5–16.5]	41.4	[30.5–53.3]	211
Rural informal	50.7	[44.0–57.3]	12.0	[8.7–16.2]	37.3	[31.3–43.8]	366
Total	42.0	[37.6–46.7]	12.8	[10.5–15.6]	45.2	[40.4–50.0]	1 524
Province							
Western Cape	25.1	[17.4–34.7]	7.8	[5.0–12.0]	67.2	[57.5–75.6]	259
Eastern Cape	32.7	[25.6–40.7]	14.7	[9.8–21.5]	52.6	[43.4–61.6]	184
Northern Cape	*	*	*	*	*	*	71
Free State	65.1	[49.0–78.4]	10.1	[3.9–23.5]	24.8	[15.7–36.7]	110
KwaZulu-Natal	51.6	[41.7–61.4]	13.2	[8.8–19.2]	35.2	[25.9–45.9]	233
North West	45.2	[36.2–54.6]	14.4	[7.1–26.9]	40.4	[32.8–48.6]	156
Gauteng	33.3	[23.3–45.1]	16.0	[10.2–24.1]	50.7	[38.2–63.1]	201
Mpumalanga	68.7	[60.0–76.2]	11.9	[6.9–19.7]	19.4	[13.8–26.6]	182
Limpopo	46.4	[33.2–60.1]	7.2	[3.8–13.3]	46.4	[34.2–59.0]	128
Total	42.0	[37.6–46.7]	12.8	[10.5–15.6]	45.2	[40.4–50.0]	1 524
Race							
African	42.9	[38.0–48.0]	13.6	[11.0–16.8]	43.4	[38.2–48.8]	1 113
White	*	*	*	*	*	*	16
Coloured	29.7	[22.2–38.5]	8.3	[5.6–11.9]	62.0	[52.8–70.5]	312
Asian/Indian	*	*	*	*	*	*	55
Total	41.5	[37.1–46.1]	13.0	[10.6–15.8]	45.5	[40.8–50.3]	1 496

95% CI: 95% confidence interval

** Too few observations to record reliably*

Male participants from six provinces (Free State, Kwazulu–Natal, North West, Gauteng, Mpumalanga and Limpopo) tested to be fit and formed a significant majority in comparison with those male participants who tested to be unfit from these same six provinces. The provinces with the largest proportion of fit male participants were Mpumalanga (82.5%),Free State (73.5%) and Limpopo (70.7%). In contrast, provinces with the largest proportion of unfit male participants were Western Cape (35.5%), Eastern Cape (33.8%) and Gauteng (31.7%). A significant majority of female participants who tested to be unfit came from two provinces, Western Cape (67.2%) and Eastern Cape (52.6%), when compared to those who tested to be fit. On the other hand, two other provinces, Mpumalanga (68.7%) and Free State (65.1%), had a significant majority of female participants who were found to be fit compared to those who were unfit.

Black African male participants formed a significant majority of South Africans who tested to be fit (64.6) compared to those who tested to be unfit (25.4%)]. Coloured female participants who were found to be unfit (62%) formed a significant majority compared to those coloured females who tested to be fit (29.7%).

Discussion

The physical activity component of the present study was designed to go beyond self-reported data by providing nationally representative data on the distribution of physical fitness in South Africa based on the outcome of a submaximal cardiovascular fitness test (Shephard, Bailey, Mirwald 1976; Yuan, Zhang et al. 2008) since self-reported data have received considerable criticism for being inaccurate and unreliable as an assessment tool (Luke, Dugas, Durazo-Arvizu et al. 2011).

The trend for physical fitness was found to decrease with age, a finding that supports the reported global trend for fitness and age (Lee, Shiroma, Lobelo et al. 2012; Oyeyemi & Adeyemi 2013; Abubakari & Bhopal 2008). In 2003, an international study on physical activity completed in 51 countries, including South Africa, used self-reported data to confirm the finding of low levels of physical activity among South Africans (Guthold, Ono, Strong et al. 2008). Physical fitness among female participants, in contrast, revealed a trend of increasing fitness with age reaching a plateau in the age band 30–40 years of age. These trends, particularly among male participants, are similar to findings from studies carried out in Africa (Oyeyemi & Adeyemi 2013; Abubakari & Bhopal 2008; Sobngwi, Mbanya, Unwin et al. 2002; Muhihi, Njelekela, Mpembeni et al. 2012; Steyn, Sliwa,Hawken et al. 2005), developed countries (Kruger, Venter, Vorster et al. 2002) and at a global level (Yusuf, Hawken, Ounpuu et al. 2004; Bauman, Bull, Chey et al. 2009; Kelly, Yang, Chen et al. 2008). Similarly, the THUSA study using a self-report questionnaire also found low levels of physical activity in a population sample drawn from North West in 2002 (Kruger, Venter, Vorster et al. 2002). The notable, but insignificant, decrease in fitness levels among female participants as one proceeds from rural to urban human settlements provides credence to the view that population-level changes in areas undergoing epidemiological transition typically display such a decrease. This finding is also borne out by studies carried out in other African countries (Oyeyemi & Adeyemi 2013; Abubakari & Bhopal 2008; Sobngwi, Mbanya, Unwin et al. 2002).

Provinces with largely rural-based economies such as Mpumalanga, followed by Free State and Limpopo were found to have the largest percentages of males who were physically fit. In contrast, the more economically developed provinces of Western Cape and Gauteng were found to have the highest proportion of unfit male participants. The strong relationship between economic development status and prevalence of physical fitness is also evident from other studies (Steyn, Fourie & Temple 2006).

A limitation in this analysis on physical inactivity is that the number of participants in white and Indian South African race groups proved to be too small for reliable analysis and these are therefore not considered further in this analysis on race and physical activity. Similarly, the number of male participants from Northern Cape was too small to be included in the provincial analysis on physical activity.

3.4.3 Anthropometry

Investing in nutrition is as much an issue of health, of care, and of food sovereignty, as it is of human rights, of economic welfare, and of social protection. Nutrition should be central to all renewed commitments and efforts to realise the Millennium Development Goals (MDGs) (Schuftan 2011). Long-term health outcomes are shaped by factors largely outside of the health system such as lifestyle, diet and nutritional levels and education (National Planning Commission 2012). One of the major aims of SANHANES is to provide information that is useful for studying the relationship between diet, nutritional status, and health in the South African population.

The field of anthropometry encompasses a variety of human body measurements, such as weight, height, and size, including skinfold thicknesses, and circumferences. In adults, body measurement data are used to evaluate health and dietary status, disease risk, and body composition changes that occur over the adult lifespan. Anthropometry provides the single most portable, universally applicable, inexpensive and non-invasive technique for assessing the size, proportions, and composition of the human body. It reflects both health and nutritional status and predicts performance, health and survival. As such, it is a valuable tool for guiding public health policy and clinical decisions (WHO 1995).

The body mass index (BMI) is a measure of nutritional status that combines weight with height data. It provides an acceptable approximation for assessment of total body fat and is a fairly reliable indicator of body fat for most adults, with athletes and the elderly being two exceptions. The BMI has been considered to be the most appropriate and simple indicator by which weight-for-height can be related to health outcomes. It is widely acknowledged that the risk of illness increases with modest increases in weight, starting from a BMI of about 21 kg/m^2 (Rigby 2006).

Alternative measures that reflect abdominal adiposity, such as waist circumference, waist–hip ratio and waist–height ratio, have been suggested as being superior to BMI in predicting cardiovascular disease (CVD) risk (WHO 2011). This is based largely on the rationale that increased visceral adipose tissue is associated with a range of metabolic abnormalities, including decreased glucose tolerance, reduced insulin sensitivity and adverse lipid profiles, which are risk factors for type 2 diabetes and cardiovascular disease (CVD). Waist–hip ratio (the waist circumference divided by the hip circumference) can be measured more precisely than skin folds, and it provides an index of both subcutaneous and intra-abdominal adipose tissue (Bjorntorp 1987).

In South Africa, overweight and obesity are thought to be on the rise. For example, over 56% of adult black African females are either overweight or obese compared to 29% of males (DHS, 2003). The highest prevalence of obesity in females was in adult black African females, who are also socioeconomically disadvantaged. In the same study, urbanisation differentiated obesity prevalence in black African females, with those residing in urban areas presenting with a higher prevalence than those from rural areas. Moreover, obesity in South African children and adolescents followed a similar pattern. SANHANES will provide information on the current nutritional status of adult South Africans based on anthropometric measures, compared to previous national surveys. The standard WHO methodological procedures were used in measuring all anthropometric indices (WHO 2008). A certified anthropometrist conducted the training.

Results

In this section, results on weight management are presented.

Body weight and height

The mean weight (kg) and height (cm) of participants 15 years of age and older by sex, age, locality, province and race, indicate that, overall, South African females were significantly heavier than males (72.2 kg compare to 67.3 kg). However, males were significantly taller than females (168.5 cm compared to 157.8 cm) (Table 3.4.3.1). The highest mean weights were seen in the age groups 45–54 years of age and 55–64 years of age in both sexes (74.7 kg and 71.8 kg for males and 79.4 kg and 77.2 kg for females respectively) compared to the group 15–24 years of age (59.6 kg and 63.0 kg in males and females, respectively). Females within the group 65 years of age and older were the shortest (155.0 cm) compared to the other age groups (157.0 cm to 159.3 cm).

Males living in urban formal areas were significantly heavier (70.3 kg) than the other groups (range 62.8kg to 64.6 kg). Females in the same residential areas on the other hand were significantly heavier (74.1kg) than females living in the rural formal (68.3kg) and informal (70.4kg) areas. No significant differences in height were observed.

Western Cape and Gauteng had significantly heavier males (73.1 kg and 70.3 kg, respectively) than North West and KwaZulu-Natal (60.7 kg and 65.3 kg, respectively). They also had significantly heavier females (Western Cape 71.1 kg; Gauteng 76.0 kg) than North West (65.9 kg). The tallest males were in Gauteng and Limpopo (170.1 cm and 170.1 cm, respectively) compared to Northern Cape and KwaZulu-Natal which shared the shortest mean heights (166.7 cm). The females in Gauteng and Limpopo were taller (159.0 cm and 158.8 cm) than females in the Western Cape (157.5 cm), Eastern Cape (157.2 cm), Northern Cape (156.1 cm), North West (156.3 cm), Free State (156.6 cm), and KwaZulu-Natal (157.0 cm). All differences were significant.

No significant differences in race were found in males for both weight and height. For females however, black Africans were significantly heavier (72.6 kg) and taller (157.8 cm) than both the coloured (69.0 kg and 156.4 cm, respectively) and Asian/Indian (64.2 kg and 155.8 cm respectively) race groups.

Body mass Index (BMI)

The mean BMI and percentage of males (Table 3.4.3.2) and females (Table 3.4.3.3) 15 years of age and older by BMI categories for age, locality, province and race, indicate that, overall, South African males had a mean BMI of 23.6 kg/m^2, which was significantly lower than that of females (28.9 kg/m^2). The prevalence of overweight and obesity was significantly higher in females than males (24.8% and 39.2% compared to 20.1% and 10.6% for females and males, respectively). On the other hand, the prevalence of underweight and normal weight was significantly higher in males than females (12.8 and 56.4 compared to 4.2 and 31.7 for males and females, respectively). There was a trend demonstrating that the BMI increased with age in both sexes, while it later decreased in females in the group 65 years of age and older. The groups 45–54 years of age, 55–64 years of age and 65 years of age and older had significantly higher mean BMI (31.7 kg/m^2, 31.3 kg/m^2, 30.0 kg/m^2 for females, respectively and 26.0 kg/m^2, 25.2 kg/m^2, 25.6 kg/m^2 for males, respectively), when compared with the groups 15–17 years of age and 18–24 years of age (23 kg/m^2 and 26.2 kg/m^2 for females and 20.4 kg/m^2 and 21.3 kg/m^2 for males, respectively).

Table 3.4.3.1: Mean weight and height among participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	Male						Female					
	Weight (kg)			Height (cm)			Weight (kg)			Height (cm)		
	Mean	95% CI	Total (n)	Mean	95% CI	Total (n)	Mean	95% CI	Total (n)	Mean	95% CI	Total (n)
Age												
15–24	59.6	[58.5–60.8]	790	168.6	[167.8–169.3]	795	63.0	[61.5–64.6]	1 227	158.2	[157.5–158.8]	1 240
25–34	67.7	[65.6–69.9]	417	169.9	[168.5–171.4]	414	71.7	[70.0–73.4]	829	158.5	[157.7–159.2]	837
35–44	69.1	[66.8–71.5]	365	169.3	[168.1–170.5]	368	75.9	[73.6–78.2]	744	159.3	[158.5–160.1]	755
45–54	74.7	[70.9–78.5]	391	168.7	[166.8–170.6]	392	79.4	[76.5–82.3]	774	157.7	[157.0–158.4]	773
55–64	71.8	[67.9–75.7]	365	167.3	[165.1–169.4]	365	77.2	[74.9–79.6]	613	157.0	[156.2–157.8]	607
65+	71.2	[69.2–73.2]	274	166.9	[165.8–168.0]	277	72.8	[70.2–75.4]	572	155.0	[154.2–155.7]	562
Locality												
Urban formal	70.3	[68.4–72.2]	1 269	169.6	[168.6–170.6]	1 278	74.1	[72.3–75.8]	2 289	158.2	[157.6–158.7]	2 293
Urban informal	62.8	[60.6–64.9]	284	166.2	[163.1–169.3]	284	71.3	[69.4–73.2]	586	158.2	[157.1–159.2]	585
Rural formal	63.1	[60.7–65.6]	428	167.3	[165.9–168.6]	429	68.3	[65.6–70.9]	645	156.4	[155.5–157.3]	656
Rural informal	64.6	[63.2–65.9]	621	167.7	[167.0–168.5]	620	70.4	[69.1–71.7]	1 239	157.4	[156.9–157.9]	1 240
Province												
Western Cape	73.1	[68.3–77.9]	417	169.1	[166.9–171.3]	421	71.1	[69.2–73.1]	750	157.5	[156.5–158.6]	756
Eastern Cape	64.2	[62.2–66.2]	373	167.5	[166.4–168.6]	374	70.8	[68.5–73.0]	602	157.2	[156.4–158.0]	610
Northern Cape	63.5	[59.8–67.1]	153	166.7	[164.7–168.6]	148	70.0	[64.8–75.2]	279	156.1	[154.7–157.4]	279
Free State	63.5	[59.6–67.3]	226	168.3	[167.3–169.2]	228	72.8	[70.4–75.2]	364	156.6	[155.6–157.6]	363
KwaZulu-Natal	65.3	[63.4–67.1]	392	166.7	[165.1–168.4]	391	72.7	[70.0–75.4]	708	157.0	[156.3–157.6]	699
North West	60.7	[58.3–63.0]	275	167.0	[165.8–168.2]	275	65.9	[63.6–68.2]	576	156.3	[155.1–157.4]	578
Gauteng	70.3	[67.3–73.3]	283	170.1	[168.5–171.8]	285	76.0	[73.4–78.7]	565	159.0	[158.1–159.9]	566
Mpumalanga	68.2	[65.7–70.6]	289	168.3	[166.6–170.0]	296	71.3	[68.8–73.9]	512	158.5	[157.3–159.7]	524
Limpopo	66.7	[63.6–69.8]	194	170.1	[168.6–171.3]	193	69.9	[67.9–71.9]	403	158.8	[157.9–159.8]	399
Race												
African	66.1	[64.9–67.3]	1 769	168.3	[167.6–170.0]	1 781	72.6	[71.5–73.7]	3 351	157.8	[157.4–158.3]	3 367
White	*	*	66	*	*	67	*	*	80	*	*	80
Coloured	68.7	[65.4–72.0]	557	167.9	[165.6–170.2]	556	69.0	[67.3–70.7]	1 020	156.4	[155.6–157.3]	1 028
Asian/Indian	67.7	[62.7–72.6]	140	168.1	[167.0–169.3]	137	64.2	[57.7–70.7]	221	155.8	[154.8–156.7]	214
Total	67.3	[66.1–68.5]	2 590	168.5	[167.9–169.2]	2 599	72.2	[71.2–73.2]	4 753	157.8	[157.4–158.2]	4 767

95% CI: 95% confidence interval

** Too few observations to record reliably*

Males in group 15–17 years of age had a mean prevalence of being underweight that was 4.4 times higher than that of the group 65 years of age and older (26.2% compared to 6.0%), whereas those in group 18–24 years of age had a mean prevalence 3.0 times higher than those in the group 65 years of age and older (17.9% compared to 6%). Groups 45–54 years of age and 65 years of age and older had the lowest prevalence of normal weight (41.8% and 40% respectively) compared to the groups 15–17 years of age; 18–24 years of age and 25–34 years of age (65.0%, 72.0% and 66.3%, respectively). Males in group 65 years of age and older had a mean prevalence of 5.5 and 7.0 times higher than that of the groups 15–17 years of age and 18–24 years of age (40.4% compared to 7.3% and 5.8%). Males in the groups 45–54 years of age; 55–64 years of age, and 65 years of age and older had a mean prevalence 12.5, 12.9 and 8.7 times higher of being obese than that seen in the group 15–17 years of age (18.7%, 19.3% and 13.1%, respectively compared to 1.5%) and 4.5, 4.6 and 3.1 times higher than those in group 18–24 years of age (18.7%, 19.3% and 13.1%, respectively compared to 4.2%). All differences were significant. The extent of this trend was overall less marked among females. The highest mean BMI was seen in females of the groups 45–54 years of age and 55–64 years of age. In females, the highest prevalence of overweight (28.0%) and obesity (56.3%) was seen in the groups 25–34 years of age and 45–54 years of age, respectively. The prevalence of obesity in females 45–54 years of age was significantly higher than in females in the younger age groups (56.3% compared to 8.0%, 21.7%, 36.3%, and 44.8%).

Males living in urban formal areas had a significantly higher mean BMI (24.3 kg/m^2) compared to those in the other areas, and were 2.1 and 1.5 times more likely to be obese than those living in urban informal and rural informal areas (13.2% compared to 6.3% and 8.7%, respectively). Females living in urban formal areas had the highest mean BMI (29.4 kg/m^2), as well as the highest prevalence of obesity (42.2%). The prevalence of overweight was highest in females living in an urban informal area (27.9%). Rural formal areas had the relatively lowest prevalence of obesity (31.8%).

Males living in the Western Cape had the highest mean BMI compared to those living in other provinces – this was significantly higher except for KwaZulu-Natal, Gauteng and Mpumalanga. Males in Gauteng and Mpumalanga, on the other hand, had a significantly higher mean BMI than those in North West (24.2% compared to 21.8%). Males in the Western Cape were the least likely to be within the normal range of weight. The differences in mean BMI in the nine provinces were significant. Females, in North West and Gauteng had the lowest and highest (27.0 and 29.8 kg/m^2 respectively).

The only significant difference between race groups was found in males who were overweight, where Asian/Indian males had a significantly higher prevalence (32.2%) than black African males (19.1%).

Waist circumference

A population level mean waist circumference that exceeds the recommended waist circumference cut-off is indicative of a substantially increased risk for metabolic complications (WHO 2011). Mean waist circumference for males and females was 81.4 cm and 89.0 cm, respectively (Table 3.4.3.4). One in ten males (9.8%) had a waist circumference equal to or larger than 102 cm, while 50.8% of females had a waist circumference equal to or larger than 88 cm.

In males, the age category with the highest mean waist circumference was 65 years and older (90.6 cm), while females 45–54 years of age had the highest mean waist

Table 3.4.3.2: Mean body mass index and percentage among male participants aged 15 years and older by age, locality, province and race, South Africa 2012

Male	Body mass index		BMI Categories								Total
Background characteristics			Underweight <18.5		Normal 18.5–24.9		Overweight 25–29.9		Obese 30+		
	Mean	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	N
Age											
15–17**	20.4	[19.9–20.8]	26.2	[19.4–33.1]	65.0	[57.3–72.7]	7.3	[2.8–11.8]	1.5	[0.0–2.9]	298
18–24	21.3	[20.8–21.9]	17.9	[9.9–26.0]	72.0	[64.1–79.9]	5.8	[2.9–8.8]	4.2	[1.9–6.6]	486
25–34	23.6	[22.8–24.4]	6.4	[3.9–8.9]	66.3	[59.4–73.2]	19.2	[13.7–24.7]	8.1	[3.4–12.8]	412
35–44	24.1	[23.3–24.8]	11.4	[7.5–15.4]	56.9	[49.2–64.6]	20.1	[13.7–26.4]	11.6	[7.5–15.7]	362
45–54	26.0	[24.8–27.3]	8.2	[4.7–11.8]	41.8	[34.5–49.2]	31.2	[22.5–39.9]	18.7	[11.1–26.3]	384
55–64	25.2	[24.1–26.4]	12.6	[8.3–17.0]	42.1	[34.1–50.1]	25.9	[19.0–32.8]	19.3	[13.3–25.4]	361
65+	25.6	[24.9–26.3]	6.0	[3.3–8.8]	40.4	[33.5–47.4]	40.4	[32.5–48.3]	13.1	[8.3–18.0]	269
Locality											
Urban formal	24.3	[23.6–24.9]	10.5	[7.1–13.8]	53.5	[48.4–58.5]	22.8	[18.7–27.0]	13.2	[9.8–16.7]	1 253
Urban informal	23.0	[21.8–24.1]	17.0	[9.9–24.0]	60.7	[52.9–68.4]	16.1	[10.2–22.0]	6.3	[2.7–9.8]	282
Rural formal	22.5	[21.8–23.2]	16.4	[12.1–20.7]	60.0	[53.2–66.9]	17.4	[10.6–24.3]	6.1	[2.9–9.3]	423
Rural informal	23.0	[22.5–23.5]	14.7	[11.3–18.1]	59.4	[55.0–63.8]	17.2	[13.7–20.6]	8.7	[6.3–11.2]	614
Province											
Western Cape	25.0	[24.1–25.9]	8.1	[4.7–11.5]	48.9	[42.1–55.8]	26.9	[19.1–34.6]	16.1	[10.3–21.9]	412
Eastern Cape	22.9	[22.3–23.4]	13.5	[8.8–18.2]	62.2	[56.4–68.1]	17.1	[12.7–21.5]	7.2	[4.0–10.4]	369
Northern Cape	22.5	[21.4–23.6]	15.1	[6.9–23.3]	59.9	[45.8–74.1]	17.8	[10.3–25.2]	7.2	[2.0–12.4]	148
Free State	22.5	[21.3–23.8]	13.9	[7.9–19.9]	60.8	[51.5–70.1]	19.5	[12.3–26.6]	5.8	[1.4–10.3]	225
KwaZulu-Natal	23.5	[22.8–24.3]	13.8	[6.2–21.4]	54.6	[45.0–64.1]	23.7	[17.9–29.5]	7.9	[4.1–11.8]	384
North West	21.8	[21.0–22.6]	23.6	[16.8–30.3]	60.1	[52.7–67.6]	9.0	[4.2–13.8]	7.3	[3.8–10.8]	273
Gauteng	24.2	[23.1–25.3]	9.0	[4.7–13.4]	57.1	[49.4–64.8]	21.0	[13.8–28.2]	12.9	[7.0–18.8]	282
Mpumalanga	24.2	[23.2–25.2]	8.7	[3.9–13.5]	60.9	[54.1–67.7]	17.4	[12.9–21.9]	13.0	[7.9–18.1]	287
Limpopo	23.0	[22.0–24.0]	20.7	[14.8–26.6]	51.5	[44.7–57.3]	16.3	[9.9–22.8]	11.5	[6.8–16.2]	192
Race											
African	23.4	[22.9–23.8]	12.9	[10.7–15.2]	58.6	[55.4–61.9]	19.1	[16.2–22.0]	9.4	[7.4–11.4]	1 753
White	*	*	*	*	*	*	*	*	*	*	65
Coloured	24.4	[23.3–25.3]	12.4	[8.4–16.4]	50.3	[43.8–56.9]	22.1	[15.4–28.8]	15.1	[9.3–21.0]	548
Asian/Indian	23.7	[22.1–25.3]	32.6	[8.0–57.2]	27.7	[7.1–48.3]	32.2	[25.9–38.4]	7.6	[1.2–14.0]	137
Total	23.6	[23.2–24.0]	12.8	[10.6–15.0]	56.4	[53.3–59.6]	20.1	[17.5–22.7]	10.6	[8.6–12.6]	2 572

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.4.3.3: Mean body mass index and percentage among female participants aged 15 years and older by age, locality, province and race, South Africa 2012

Female	Body mass index		BMI Categories								Total
			Underweight <18.5		Normal 18.5–24.9		Overweight 25–29.9		Obese 30+		
Background characteristic	Mean	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age											
15–17***	23.0	[22.1–24.0]	15.4	[7.2–23.5]	57.4	[49.5–65.2]	19.3	[13.3–25.3]	8.0	[3.3–12.7]	375
18–24	26.2	[25.6–26.7]	4.4	[2.6–6.3]	48.5	[43.3–53.7]	25.3	[20.8–29.9]	21.7	[17.8–25.6]	843
25–34	28.5	[27.8–29.1]	3.3	[1.8–4.8]	32.4	[28.0–36.8]	28.0	[23.7–32.4]	36.3	[31.4–41.2]	821
35–44	29.8	[29.0–30.6]	2.8	[1.7–3.9]	26.1	[21.3–30.9]	26.4	[21.7–31.0]	44.8	[38.8–50.8]	738
45–54	31.7	[30.7–32.6]	2.1	[0.9–3.2]	20.4	[15.7–25.0]	21.2	[17.1–25.3]	56.3	[51.1–61.5]	759
55–64	31.3	[30.4–32.1]	2.9	[1.2–4.5]	17.4	[13.1–21.7]	27.6	[22.2–32.9]	52.2	[46.0–58.4]	602
65+	30.0	[29.0–31.1]	3.7	[2.1–5.3]	26.4	[21.1–31.6]	23.1	[18.1–28.1]	46.9	[40.7–53.0]	557
Locality											
Urban formal	29.4	[28.8–30.0]	3.4	[1.8–5.0]	30.3	[27.2–33.3]	24.2	[21.4–27.0]	42.2	[38.4–45.9]	2 256
Urban informal	28.5	[27.7–29.3]	6.0	[2.8–9.2]	30.9	[26.1–35.6]	27.9	[23.4–32.3]	35.3	[30.7–39.9]	579
Rural formal	27.7	[26.8–28.7]	6.9	[4.3–9.4]	35.6	[30.5–40.8]	25.7	[20.9–30.5]	31.8	[27.3–36.3]	637
Rural informal	28.4	[27.8–28.9]	4.2	[3.0–5.5]	33.4	[30.4–36.5]	24.7	[22.3–27.2]	37.6	[34.3–40.9]	1 223
Province											
Western Cape	28.5	[27.8–29.2]	3.5	[2.4–4.7]	34.1	[28.5–39.6]	24.5	[20.5–28.5]	37.9	[32.6–43.2]	740
Eastern Cape	28.6	[27.7–29.4]	5.2	[3.3–7.1]	31.3	[26.3–36.3]	21.7	[18.3–25.2]	41.8	[36.7–47.0]	596
Northern Cape	28.7	[26.9–30.6]	8.4	[4.5–12.2]	29.7	[20.4–39.0]	23.4	[16.6–30.1]	38.6	[31.3–45.8]	275
Free State	29.6	[28.7–30.5]	3.5	[1.6–5.4]	32.8	[25.7–39.9]	20.7	[16.3–25.1]	43.0	[36.6–49.4]	361
KwaZulu-Natal	29.5	[28.4–30.6]	5.3	[1.4–9.2]	25.5	[21.6–29.4]	25.2	[21.5–28.9]	44.0	[37.9–50.2]	693
North West	27.0	[26.1–27.9]	7.8	[4.6–10.9]	38.2	[34.5–42.0]	22.3	[17.5–27.1]	31.7	[25.3–38.2]	569
Gauteng	29.8	[28.9–30.7]	1.7	[0.4–3.0]	30.3	[25.3–35.4]	28.1	[23.0–33.1]	39.9	[33.7–46.1]	558
Mpumalanga	28.3	[27.4–29.2]	5.2	[2.5–8.0]	32.7	[27.9–37.6]	26.2	[22.1–30.3]	35.8	[31.5–40.1]	505
Limpopo	27.7	[27.0–28.4]	4.0	[2.3–5.7]	39.4	[33.8–44.9]	24.0	[19.1–28.9]	32.6	[28.3–37.0]	398
Race											
African	29.0	[28.6–29.4]	3.6	[2.8–4.4]	31.6	[29.4–33.8]	24.9	[22.9–26.9]	39.9	[37.4–42.4]	3 308
White	*	*	*	*	*	*	*	*	*	*	79
Coloured	28.1	[27.4–28.8]	4.9	[3.6–6.3]	35.8	[31.0–40.7]	24.4	[21.2–27.5]	34.9	[30.6–39.2]	1 010
Asian/Indian	26.5	[23.6–29.4]	16.4	[2.9–29.8]	28.4	[22.1–34.7]	22.8	[15.4–30.3]	32.4	[17.5–47.3]	213
Total	28.9	[28.5–29.3]	4.2	[3.2–5.2]	31.7	[29.8–33.7]	24.8	[23.1–26.5]	39.2	[37.0–41.5]	4 695

95% CI: 95% confidence interval

** Too few observations to record reliably*

circumference (95.8 cm). The highest prevalence of an increased waist circumference (equal to or more than 102 cm in males and 88 cm in females) was seen in males 45–54 years of age (22.1%) and females 55–64 years of age (70.0%).

Participants living in an urban formal area had the highest mean waist circumference and the highest prevalence of an increased waist circumference in both males (83.3 cm) and females (90.2 cm). The highest prevalence of an increased waist circumference was 13.8% in males and 53.0% in females, in the urban formal areas compared to the other areas.

The province with the highest mean waist circumference for males was the Western Cape (84.6 cm), closely followed by Gauteng (83.0 cm), while for females the highest mean waist circumference was found in Gauteng (90.1) and KwaZulu-Natal (90.0). The highest prevalence of an increased waist circumference was seen in males in the Gauteng (13.4%) and females in KwaZulu-Natal (53.6%).

In both males and females, the highest mean waist circumference (86.4 cm and 89.9 cm respectively) and the greatest prevalence of an increased waist circumference (24.3% and 54.1% respectively) was seen in Asian/Indians.

Waist–hip ratio

The mean waist–hip ratio for males and females was 0.87 and 0.85, respectively (Table 3.4.3.5). While only 6.8% of males had a waist–hip ratio equal to or larger than 1.0, the prevalence of an increased waist–hip ratio (more than or equal to 0.85) in females was almost seven times greater at 47.1%.

Males aged 65 years and older had the highest mean waist–hip ratio (0.93), while females aged 45-54 years had the highest mean waist–hip ratio (0.91). In both males and females, the highest prevalence of an increased waist–hip ratio was seen in the group 65 years of age and older (15.6% and 67.8% respectively), followed by the group 55–64 years of age (14.2% and 62.5% respectively).

Amongst males, those living in an urban formal environment had the highest mean waist–hip ratio (0.87), as well as the highest prevalence of an increased waist–hip ratio (8.4%). Females from rural formal areas had the greatest mean waist–hip ratio (0.89) and the highest prevalence of an increased waist–hip ratio (53.9%).

In males, the highest prevalence of an increased waist hip ratio was seen in the North West (10.1%), followed by the KwaZulu-Natal (9.0%) and Western Cape (8.2%). In females, the greatest prevalence of an increased waist–hip ratio was seen in the Western Cape (51.5%) followed by North West (50.9%) and KwaZulu-Natal (50%).

In males and females, the highest prevalence of an increased waist–hip ratio was in Asians/Indians (24.9% and 64.8% respectively), followed by coloureds (8.4% and 52.9% respectively).

Table 3.4.3.4: Mean waist circumference and percentage among participants aged 15 years and older who exceed the waist circumference cut offs for increased and substantially increased risk for metabolic complications by sex, age, locality, province and race, South Africa 2012

Background characteristics	Males							Females						
	Waist circumference		*Waist ≥ 94 cm		#Waist ≥ 102 cm		Total	Waist circumference		*Waist ≥ 80 cm		#Waist ≥ 88 cm		Total
	Mean	95% CI	%	95% CI	%	95% CI	n	Mean	95% CI	%	95% CI	%	95% CI	n
Age														
15–19***	70.2	[69.3–71.1]	1.5	[0.4–2.6]	0.5	[0.0–1.2]	471	75.9	[74.3–77.5]	32.1	[26.2–37.9]	15.2	[10.5–20.0]	617
20–24	73.7	[71.7–75.7]	5.7	[2.4–8.9]	2.3	[0.2–4.5]	319	82.0	[80.3–83.8]	52.4	[46.0–58.7]	32.9	[26.3–39.6]	598
25–34	80.8	[78.7–82.9]	11.3	[5.6–17.0]	6.1	[1.5–10.6]	404	87.7	[86.3–89.0]	67.2	[63.1–71.3]	48.1	[43.1–53.0]	820
35–44	82.8	[80.9–84.8]	18.9	[12.8–24.9]	8.6	[5.0–12.2]	363	90.9	[89.2–92.6]	74.6	[69.6–79.7]	54.9	[49.0–60.8]	744
45–54	89.5	[86.7–92.3]	39.9	[31.1–48.7]	22.1	[14.2–30.0]	395	95.8	[93.9–97.6]	81.7	[77.9–85.5]	69.9	[65.6–74.3]	758
55–64	87.4	[85.2–89.6]	34.1	[28.1–40.2]	16.3	[11.2–21.3]	368	95.7	[94.0–97.5]	85.5	[81.9–89.2]	70.0	[64.3–75.7]	597
65+	90.6	[88.6–92.5]	39.7	[31.9–47.5]	16.1	[10.3–21.8]	272	93.5	[91.8–95.2]	79.8	[75.4–84.1]	60.3	[54.5–66.0]	558
Locality														
Urban formal	83.3	[81.6–85.0]	26.3	[22.2–30.5]	13.8	[10.6–17.1]	1 265	90.2	[88.9–91.5]	71.5	[68.0–75.0]	53.0	[48.9–57.1]	2 237
Urban informal	78.0	[75.9–80.0]	8.7	[5.1–12.4]	3.2	[1.3–5.0]	280	87.6	[85.5–89.7]	63.9	[57.3–70.5]	47.4	[42.0–52.9]	572
Rural formal	79.3	[77.1–81.5]	10.8	[6.0–15.7]	4.9	[2.2–7.7]	426	87.6	[84.8–90.4]	64.2	[56.3–72.1]	48.8	[40.3–57.4]	650
Rural informal	79.6	[78.4–80.7]	15.3	[12.2–18.4]	5.8	[3.9–7.8]	621	87.9	[86.8–89.0]	65.3	[62.1–68.5]	48.8	[45.7–51.8]	1 233
Province														
Western Cape	84.6	[82.2–87.1]	29.8	[22.8–36.7]	12.8	[7.3–18.4]	415	89.0	[87.1–90.9]	68.8	[63.8–73.9]	50.4	[44.5–56.3]	747
Eastern Cape	78.8	[77.1–80.5]	14.0	[9.6–18.4]	5.5	[2.7–8.2]	374	88.1	[86.3–89.9]	65.1	[59.8–70.3]	51.1	[45.5–56.6]	605
Northern Cape	79.2	[77.0–81.5]	11.3	[4.4–18.2]	4.3	[1.2–7.5]	152	89.1	[85.4–92.9]	70.0	[61.2–78.7]	51.7	[42.2–61.3]	270
Free State	78.3	[74.8–81.8]	17.6	[7.7–27.6]	9.6	[3.6–15.6]	226	89.0	[86.7–91.4]	64.0	[59.0–68.9]	50.2	[44.1–56.2]	359
KwaZulu-Natal	81.4	[79.6–83.1]	18.2	[12.3–24.0]	8.6	[4.1–13.1]	391	90.0	[88.1–91.9]	69.0	[64.1–73.9]	53.6	[48.7–58.4]	687
North West	77.7	[74.6–80.7]	15.3	[9.0–21.6]	8.2	[3.9–12.5]	274	85.9	[83.7–88.2]	61.9	[55.2–68.6]	43.5	[38.4–48.6]	574
Gauteng	83.0	[79.8–86.2]	24.6	[17.5–31.7]	13.4	[8.0–18.8]	272	90.1	[87.6–92.5]	71.5	[64.6–78.3]	51.4	[43.7–59.1]	524
Mpumalanga	82.0	[80.1–83.8]	17.6	[11.8–23.4]	7.9	[3.9–11.9]	294	88.4	[86.9–90.0]	71.6	[66.3–76.9]	49.4	[44.3–54.5]	527
Limpopo	80.5	[78.3–82.8]	16.7	[11.1–22.2]	7.9	[4.1–11.8]	194	88.1	[86.3–89.8]	65.9	[60.7–71.0]	49.9	[43.9–55.9]	399
Race														
African	80.2	[79.1–81.4]	17.4	[14.5–20.3]	8.0	[6.2–9.9]	1 764	88.9	[88.0–89.9]	67.6	[65.1–70.1]	51.1	[48.4–53.8]	3 314
White	*	*	*	*	*	*	67	*	*	*	*	*	*	77
Coloured	83.3	[81.0–85.7]	25.7	[18.5–32.9]	12.0	[6.5–17.4]	559	88.5	[86.7–90.2]	67.2	[62.5–71.9]	49.9	[45.0–54.7]	1 015
Asian/Indian	86.4	[82.2–90.6]	36.9	[29.6–44.3]	24.3	[15.9–32.7]	131	89.9	[86.4–93.4]	79.5	[74.1–84.9]	54.1	[41.8–66.5]	201
Total	81.4	[80.3–82.4]	20.2	[17.5–22.8]	9.8	[7.8–11.7]	2 592	89.0	[88.2–89.8]	68.2	[65.9–70.4]	50.8	[48.3–53.2]	4 692

95% CI: 95% confidence interval
** Too few observations to record reliably*
*** waist circumference ≥94 cm in males and ≥80 cm in females represent increased risk for metabolic complications*
#waist circumference ≥102 cm in males and ≥88 cm in females represent substantially increased risk for metabolic complication
****Significant difference between 15-19 and 20-24 year olds, for both male and female, $p < 0.0001$*

Table 3.4.3.5: Mean waist hip ratio and percentage among participants aged 15 years and older who exceed the recommended waist hip ratio by sex, age, locality, province and race, South Africa 2012

	Males					Females				
	Waist–hip ratio		WHR ≥ 1.0		Total	Waist-hip ratio		WHR ≥ 0.85		Total
Background characteristics	Mean	95% CI	%	95% CI	n	Mean	95% CI	%	95% CI	n
Age										
15–24	0.81	[0.80–0.82]	1.1	[0.3–1.8]	788	0.80	[0.79–0.81]	22.1	[18.4–25.9]	1 211
25–34	0.86	[0.84–0.87]	3.0	[0.0–7.1]	403	0.83	[0.83–0.84]	44.1	[38.4–49.7]	822
35–44	0.88	[0.87–0.89]	3.3	[1.3–5.2]	361	0.84	[0.81–0.87]	48.1	[42.4–53.8]	744
45–54	0.92	[0.90–0.93]	13.1	[5.8–20.4]	395	0.91	[0.87–0.96]	61.8	[56.4–67.2]	761
55–64	0.92	[0.90–0.93]	14.2	[9.4–19.0]	364	0.89	[0.86–0.92]	62.5	[56.8–68.2]	597
65+	0.93	[0.92–0.94]	15.6	[9.7–21.6]	269	0.88	[0.86–0.90]	67.8	[62.0–73.6]	550
Locality										
Urban formal	0.87	[0.86–0.88]	8.4	[5.5–11.4]	1 257	0.85	[0.83–0.86]	47.2	[43.3–51.1]	2 233
Urban informal	0.86	[0.84–0.88]	3.4	[1.2–5.6]	280	0.88	[0.82–0.95]	46.7	[40.8–52.7]	568
Rural formal	0.87	[0.85–0.89]	5.6	[2.2–9.0]	425	0.89	[0.84–0.94]	53.9	[46.6–61.1]	652
Rural informal	0.86	[0.85–0.87]	5.2	[3.1–7.4]	618	0.84	[0.83–0.85]	45.6	[41.6–49.7]	1 232
Province										
Western Cape	0.88	[0.86–0.89]	8.2	[4.3–12.0]	415	0.87	[0.84–0.89]	51.5	[45.2–57.9]	744
Eastern Cape	0.86	[0.84–0.87]	3.9	[1.6–6.1]	374	0.87	[0.82–0.92]	46.1	[39.6–52.6]	605
Northern Cape	0.86	[0.84–0.87]	2.7	[0.4–5.1]	152	0.85	[0.84–0.86]	46.7	[38.1–55.3]	270
Free State	0.86	[0.84–0.87]	6.3	[2.5–10.1]	225	0.87	[0.80–0.94]	43.1	[34.1–52.0]	360
KwaZulu-Natal	0.87	[0.86–0.89]	9.0	[4.8–13.1]	389	0.85	[0.84–0.86]	50.0	[44.2–55.8]	684
North West	0.88	[0.86–0.90]	10.1	[4.7–15.6]	274	0.86	[0.84–0.87]	50.9	[44.0–57.9]	576
Gauteng	0.87	[0.85–0.89]	6.7	[1.6–11.7]	269	0.84	[0.81–0.87]	43.3	[36.8–49.8]	519
Mpumalanga	0.87	[0.85–0.88]	5.3	[2.4–8.3]	291	0.87	[0.83–0.90]	49.6	[43.1–56.1]	528
Limpopo	0.86	[0.84–0.88]	5.2	[1.6–8.7]	191	0.84	[0.83–0.85]	44.7	[37.2–52.3]	399
Race										
African	0.86	[0.85–0.87]	5.1	[3.7–6.6]	1 756	0.85	[0.84–0.86]	45.7	[42.9–48.6]	3 308
White	*	*	*	*	67	*	*	*	*	78
Coloured	0.88	[0.86–0.90]	8.4	[4.4–12.1]	558	0.86	[0.85–0.87]	52.9	[47.8–58.0]	1 012
Asian/Indian	0.92	[0.90–0.94]	24.9	[15.7–34.1]	129	0.88	[0.87–0.89]	64.8	[56.7–72.8]	201
Total	0.87	[0.86–0.87]	6.8	[5.1–8.5]	2 580	0.85	[0.84–0.86]	47.1	[44.6–49.5]	4 685

95% CI: 95% confidence interval

** Too few observations to record reliably*

Discussion

Bodyweight is known to be associated with increased morbidity and mortality both at the underweight and overweight ranges. In particular, excess body weight is known to be an important risk factor for NCDs and excess mortality worldwide (WHO 2009, WHO 2011a)

An analysis of worldwide trends in population mean BMI from 1980 to 2008 showed an increase of between 0.4–0.5 kg/m^2 per decade for males and females. Males in southern Africa were not among those with the lowest BMIs. Females from southern Africa also maintained their position in the top four BMI subregions compared to 1980. The female mean BMI was 29 kg/m^2 or greater in several countries including South Africa (Finucane 2011). The current survey shows that the trend for increasing mean BMI in South Africa, particularly among females, has continued.

Results of STEPS surveys (WHO 2008) involving South Africa's neighbours such as Mozambique, Lesotho, Swaziland, Botswana, Zimbabwe and Zambia, showed the same pattern of higher mean BMI in females. South Africa and Swaziland had the highest mean BMI (26.2 compared to 26.7 kg/m^2) and overweight (22.6% compared to 28.6%) and obesity (25.8% compared to 24.3%) prevalence for both sexes combined, while Mozambique had the lowest. Mean BMI for males from Swaziland was the highest of all the countries, including South Africa (24.8 kg/m^2 compared to 23.5 kg/m^2).

A comparison of data from the current survey with the South African 2003 DHS (Department of Health 2007) showed:

- There are major changes across all BMI categories. The percentage of underweight and normal weight decreased, while overweight and obesity increased. Obesity increased very dramatically from 27% to 39.2% among females. Mean BMI increased across all age categories, provinces, and race groups. The greatest increase in mean BMI was seen in the group 55–64 years of age (28.5 kg/m^2 to 31.3 kg/m^2), and in the Free State (26.4 kg/m^2 to 29.6 kg/m^2).
- There is an increase in waist circumference (mean and prevalence) in males and females across almost all age groups, localities, provinces, and race groups. The Western Cape (12.8%) and Gauteng (13.4%) remained the provinces with the greatest prevalence of males with an increased waist circumference, while among females Gauteng (51.4%) was headed by KwaZulu-Natal (53.6%) with the Western Cape at 50.4%.
- There is a rise in the prevalence of an increased waist–hip ratio in males and females across all age groups, localities, provinces, and race groups. Among males and females, the highest prevalence of an increased waist–hip ratio was in Asians/Indians (24.9% and 64.8% respectively), followed by coloureds (8.4% and 52.9% respectively).

The results show a worsening of the nutritional status of adult males and particularly females based on various anthropometric measures. The BMI, waist circumference, and waist–hip ratio all show the same trend, that is to say that obesity levels have increased in South Africa and with them an increased risk of metabolic complications associated with chronic diseases. Interventions, both preventative and case management, are urgently required at policy, population, and programme levels.

3.5 Food security

Hunger has a detrimental impact on the population both socially and physically. Hunger is also referred to as food insecurity, while its absence is considered as evidence of food security; either by the individual or the household. Food security is defined as a condition that 'exists when all people, at all times, have physical, social and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life' (FAO 2010).

3.5.1 Household food security

Hunger (food insecurity) was assessed by means of the Community Childhood Hunger Identification Project (CCHIP) (Wehler, Scott, Anderson et al. 1992). The index is internationally used and validated. The CCHIP index is based on eight occurrence questions that represent a generally increasing level of severity of food insecurity (access) and that are related to whether adults and/or children are affected by food shortages, perceived food insufficiency or altered food intake due to constrained economic resources within the household. A score of five or more affirmative responses out of eight indicates the presence of food shortage in the household. Household members can be considered to be 'hungry'. A score of one to four indicates that members of the household are at risk of hunger. A score of zero indicates that the household is food secure.

Hunger was measured in the present study because it is important to assess how food secure the population is. Also, it was important to see whether the situation had improved since hunger was last evaluated by the National Food Consumption Survey in 2005.

Hunger (food insecurity) was assessed by means of the CCHIP. The index is internationally used and validated. The CCHIP is based on the principle that the experience of food insecurity causes predictable reactions and responses that can be captured and quantified through a survey and summarised in a scale. These feelings include the following:
- Feelings of uncertainty or anxiety over food (situation, resources, or supply);
- Perceptions that food is of insufficient quantity (for adults and children);
- Perceptions that food is of insufficient quality (includes aspects of dietary diversity, nutritional adequacy, preference);
- Reported reductions of food intake (for adults and children);
- Reported consequences of reduced food intake (for adults and children); and
- Feelings of shame for resorting to socially unacceptable means to obtain food resources (Coates et al. 2007).

The CCHIP questionnaire consists of eight occurrence questions that represent a generally increasing level of severity of food insecurity (access), and nine frequency-of-occurrence questions that are asked as a follow-up to each occurrence question to determine how often the condition occurred. The frequency-of-occurrence question is skipped if the respondent reports that the condition described in the corresponding occurrence question was not experienced in the previous four weeks (30 days).

Results

Overall, 45.6% of the population were food secure (score of 0), 28.3% were at risk of hunger (score 1–4) and 26.0% experienced hunger (were food insecure) (Table 3.5.1.1). The largest percentage of participants who experienced hunger (food insecurity) were in urban informal (32.4%) and in rural formal (37.0%) localities. The highest rate of being at risk of hunger was in the urban informal (36.1%) and rural informal (32.8%) areas. The lowest rate of hunger was reported in urban formal areas (19.0%). By province, the rate of hunger was the lowest in the Western Cape (16.4%) and Gauteng (19.2%). This was signigficantly lower than the rate of hunger in the Eastern Cape and Limpopo, which were the only two provinces with a hunger rate higher than 30%. The black African race group had the highest rate of food insecurity (30.3%), followed by the coloured population (13.1%). Furthermore, 30.3% of the black African population and 25.1% of the coloured population were at risk of hunger. A large percentage (28.5%) of the Indian population was also at risk of hunger. The majority (89.3%) of the white population were significantly food secure.

Table 3.5.1.1: Household food security using the CCHIP hunger scale by locality, province and race, South Africa 2012

Background characteristics	Food secure		At risk of hunger		Experience hunger		
	Score of 0		Score of 1–4		Score of 5 or more		Total
	%	95% CI	%	95% CI	%	95% CI	n
Locality							
Urban formal	55.4	[51.2–59.6]	25.6	[22.6–28.9]	19	[16.0–22.4]	3 411
Urban informal	31.5	[26.0–37.5]	36.1	[31.0–41.5]	32.4	[27.1–38.3]	754
Rural formal	50.9	[41.0–60.8]	20.3	[15.6–25.8]	28.8	[22.2–36.5]	634
Rural informal	30.2	[26.7–33.8]	32.8	[29.5–36.3]	37	[33.3–40.9]	1 316
Total	45.6	[42.9–48.3]	28.3	[26.3–30.5]	26	[23.9–28.3]	6 115
Province							
Western Cape	57.9	[48.7–66.6]	25.6	[20.4–31.7]	16.4	[11.8–22.5]	813
Eastern Cape	31.4	[25.3–38.2]	32.4	[27.2–38.0]	36.2	[29.8–43.3]	788
Northern Cape	56.5	[40.8–71.0]	22.8	[15.4–32.3]	20.7	[13.0–31.3]	398
Free State	39.3	[32.5–46.5]	31.9	[25.4–39.3]	28.8	[23.9–34.2]	419
KwaZulu-Natal	37.3	[30.8–44.3]	34.4	[29.6–39.6]	28.3	[22.9–34.4]	1 206
North West	40.4	[34.4–46.8]	30.0	[25.3–35.2]	29.5	[22.9–37.1]	583
Gauteng	56.0	[49.5–62.2]	24.8	[20.1–30.3]	19.2	[14.6–24.9]	882
Mpumalanga	55.0	[44.7–64.9]	15.5	[10.4–22.3]	29.5	[22.0–38.4]	535
Limpopo	41.9	[35.9–48.2]	27.3	[23.1–32.0]	30.8	[26.2–35.7]	491
Total	45.6	[42.9–48.3]	28.3	[26.3–30.5]	26.0	[23.9–28.3]	6 115
Race of household head							
African	39.3	[36.6–42.2]	30.3	[28.1–32.7]	30.3	[27.8–33.0]	4 002
White	89.3	[81.3–94.1]	9.4	[4.8–17.6]	1.3	[0.5–3.3]	365
Coloured	61.8	[56.0–67.2]	25.1	[21.1–29.7]	13.1	[9.9–17.1]	1 046
Asian/Indian	62.9	[41.8–80.1]	28.5	[15.4–46.6]	8.6	[4.8–14.7]	611
Total	45.5	[42.8–48.2]	28.4	[26.3–30.5]	26.1	[23.9–28.4]	6 024
Total	45.6	[42.9–48.3]	28.3	[26.3–30.5]	26.0	[23.9–28.3]	6 115

95% CI: 95% confidence interval

Discussion

The results from four national surveys (see table below), using the CCHIP index as indicator for food security, showed that the proportion of food insecure households halved from 1999 to 2008 (from 52.3% to 25.9%), while the proportion of households at risk of food insecurity varied between 23.0% and 27.9% (Labadarios et al. 2008, 2011). Results from SANHANES-1 suggest that the marked improvement in household food security status observed in 2008 has been maintained, but not improved. Improved household food security implies that food is more available and accessible to a larger part of the population, which may be due to many factors including social and economic improvements.

Scores for food security, risk of hunger and experience of hunger (food insecurity) using data from four national surveys, South Africa 2012

Variable	NFCS 1999 (n = 2 735) (%)	NFCS 2005 (n = 2 413) (%)	SASAS 2008 (n = 1 150) (%)	SANHANES 2012 (n = 6 306) (%)
Food security	25.0	19.8	48.0	45.6
At risk of hunger	23.0	27.9	25.0	28.3
Experiencing hunger	52.3	52.0	25.9	26.0

NFCS, National Food Consumption Survey; SASAS, South African Social Attitudes Survey; SANHANES-1, South African National Health and Nutrition Examination Survey.

According to the Global Hunger Index (GHI), which is based on insufficient energy intake, child underweight and child morbidity, the severity of hunger in South Africa (GHI 5.8) can be described as 'moderate'. The GHI further shows that the severity of hunger in South Africa is substantially lower than in most other African countries (for instance Nigeria, Kenya, Malawi, Namibia, and Uganda with a GHI > 10) and in the same range as that of Mauritius (GHI 5.4) and China (GHI 5.1) (International Food Policy Research Institute 2012). Although South Africa has an adequate food supply at the national level, it does not, however, guarantee food security at the household level (Du Toit et al. 2011).

A substantial proportion of particularly black African and coloured households remain at risk of hunger or are experiencing hunger. According to the 2010/2011 Income and Expenditure survey of Stats SA, the total consumption expenditure on food, beverages and tobacco in the country was 13.9%. Black African and coloured households had the highest consumption expenditure on food, beverages and tobacco (19.9% and 18.6%, respectively), when compared with Indian and white households (7.4% and 7.2%, respectively). In the SANHANES-1, at provincial level, the Eastern Cape (34.8%) and Limpopo (29.4%) provinces had the highest rate of hunger, yet these two provinces had the highest consumption expenditure on food, beverages and tobacco (18.8% and 22.1% respectively) according to the Income and Expenditure of Households 2010/2011, 2011 (Stats SA 2012). Household income is particularly important in relation to food security as it directly affects the household's financial access to food. Within the Strategic Plan 2012/13–2016/17 for the Department of Agriculture, Forestry and Fisheries (South African Department of Agriculture, Forestry and Fisheries) a Food Security Policy will be adopted with the aim to improve household food security and a Zero Hunger Programme and the process has been initiated.

3.5.2 Household alcohol use

This section reports on selected findings on the perceptions of heads of households about household alcohol consumption and its seriousness, the impact of household alcohol use on violence, and the habit of eating food or snacks while drinking alcohol.

South Africa has one of the highest levels of alcohol consumption in the world (Parry, Pluddemann, Steyn et al. 2005; Rehm et al. 2003; WHO 2011). This is because some South Africans engage in what is known as hazardous and harmful drinking. Hazardous drinking is defined as a quantity or pattern of alcohol consumption that places individuals at risk for adverse health events, while harmful drinking is defined as alcohol consumption that results in adverse events (Peltzer, Njuho & Davids 2011; Shisana et al. 2005). A particularly destructive form of hazardous drinking that is common in South Africa as in other countries in the Southern African region is known as binge (that is, heavy episodic) drinking which leads to intoxication and occurs mostly during weekend, month end, and holidays. Binge drinking is a major global contributing factor to death, disease and injury (WHO 2011). For example, the South African Police Service crime intelligence reported that approximately 80% of murders, 60% of attempted murders, 75% of rapes and 90% of all assault perpetrators were under the influence of alcohol when they committed the act of violence (SAPS 2011).

Several national surveys have been conducted on alcohol use in South Africa. These include samples of school-going youth, youth within the community and mixed samples that include both youth and adults in the general population (Shisana et al 2002, 2005, 2008; Reddy et al. 2003, 2010, 2013). Three national Youth Risk Behaviour Surveys (YRBS) have been conducted by the Medical Research Council (MRC) of South Africa. The studies included over 10 000 grades 8–11 learners in 2002, 2008 and 2011. These surveys have reported relatively stable rates between 32–49% of current alcohol consumption (ever used in past 30 days) among youth (Reddy et al. 2003, 2010, 2013). Binge drinking (past month) have been shown to also having stabilised over the years at about 25% (Reddy et al. 2013). Results from the HSRC 2008 national household survey conducted with over 20 000 participants (both youth and adults) in the general population 15 years of age and older found that 41% of the men and 17% of the women 15 years and older were current drinkers. This study found that hazardous and binge drinking was reported by 9% of current drinkers (Peltzer et al. 2011). The findings on alcohol use in 2008 showed a slight increase in drinking rates when compared to the 2005 HSRC national household survey (Peltzer et al. 2011).

Alcohol consumption often has a negative impact far beyond the physical and psychological health of the drinker. It often affects the wellbeing and health of others and may have a negative impact at different levels including the home, the community and the workplace (WHO 2004, 2011). Alcohol can affect the ability of a parent or guardian to care for children due to intoxication. Drinking and intoxication can also adversely affect intimate and family relations, and friendships due to the propensity of those who are intoxicated to use violence, which can lead to disturbance of peace and result in being arrested. An extensive body of literature has shown a relationship between men's alcohol use and intimate partner violence (IPV) (Foran & O'Leary 2008, Lipsey et al. 1997, Kantor & Straus 1989, White & Chen 2002).

Socio-economic status, sex and race have been associated with high alcohol use. For example, Ames, Cunradi, Duke et al. (2013) found that lower socio-economic populations, including blue-collar workers, were at higher risk for problem drinking and intimate partner violence. Previous research on alcohol use has shown that whites in South

Africa have been shown to be low-risk drinkers as they tend to drink mostly moderately amounts of alcohol including particularly at meals (see Peltzer et al. 2011; Shisana et al. 2005, 2009). Moderate levels of average volume of alcohol consumption has also been shown to have some important health benefits such as preventing coronary heart disease, diabetes, and cholelithiasis (gallstones) (Rehm, Sempos & Trevisan, 2003; Rimm, Klatsky, Grobbee et al. 1996; Yusuf et al. 2004, also see WHO 2004). High-risk drinkers and those who have alcohol dependency frequently replace meals with alcohol (see Jacobs & Steyn, 2013). A New York City study showed that drinkers of both sexes who mainly consumed alcohol without food were less educated and current smokers (Stranges et al. 2006). However, ChungShil, JoungWon and WhaJin (2000) found that alcohol drinking increased snacking and the intakes of energy, protein, dietary fibre, vitamin A, B1, B6, Fe and P. An Australian study found that women who binge eat, also binge drink (Kanea, Loxtonb, Staigera et al. 2004).

Finally alcohol may have negative impact on the consumers' health. Although alcohol is high in kilojoules (28 kJ/g) it is not metabolised as efficiently as carbohydrates and fats and is deficient in essential micronutrients (Mahan & Escott-Stump 2008). Impaired digestion may result in malabsorption of vitamins thiamine, B12, folic acid, zinc, and amino acids. Furthermore metabolism is also altered and certain nutrients are frequently affected (thiamine, vitamin B6, vitamin D, zinc, vitamin A, magnesium, phosphorus and selenium) (Jacobs & Steyn 2013). Nevertheless, there are some known protective factors that may reduce the effects of alcohol consumption. This includes predominately consuming alcohol with meals and avoiding taking alcohol outside meals to reduce intoxication (Intox 2013; Kleintjies, Peltzer & Ramlagan 2006; Soul City 2009; Trevisan et al. 2001a, 2001b).

Results

In this section, the results of perceptions of household alcohol use are presented.

Perceptions of consumption of alcohol by household members

Table 3.5.2.1 presents the results of the consumers of alcohol as reported by the heads of the households. The respondents were asked the question 'Who in your household consumes alcohol?' and according to results , the majority of the households (53.2%) did not have anyone in the household who consumed alcohol and nearly one third (31%) identified an adult male as a consumer of alcohol and about one tenth (9.3%) identified adult females.

Table 3.5.2.1: Consumers of alcohol in households

Response	N (%)
Everyone	161 (2.5)
Adult men	2 032 (31.0)
Adult women	609 (9.3)
Teenage boys	149 (2.3)
Teenage girls	38 (0.6)
Nobody	3 484 (53.2)
Don't know	81 (1.2)
Total	**6 554**

Perceptions of seriousness of the problems of misuse of alcohol in households

To assess the seriousness of alcohol use, the respondents were asked 'How serious are the problems of misuse of alcohol in your household?' Figure 3.5.2.1 and Table 3.5.2.2 present results on the perceived seriousness of the problems of misuse of alcohol. It was found that among the 45.6% of households who reported household alcohol consumption, the majority (61.3%, 95% CI: 57.3–65.2) of these members were not perceived to have a problem of misuse of alcohol by the head of the household. There was a difference in these perceptions with significantly more heads of the households in both rural informal (tribal authority) and urban formal areas (67.3% and 64.5% respectively) indicating that this was the case than those of households in urban informal areas (47.3%). Conversely, significantly more heads of households in urban informal areas (14.9%) indicated that the misuse of alcohol in their households was a very serious problem when compared to urban formal and rural informal houseolds. A similar trend was also found among head of households who indicated that the misuse of alcohol in their households was a serious problem but the differences were not statistically significant.

When the data were disaggregated by province, a higher proportion of heads of households from Mpumalanga (24%) indicated that the misuse of alcohol by a family member was a very serious problem when compared to those of households in other provinces (KwaZulu-Natal 9.3%, Gauteng 8.1%, North West 6.9% and Western Cape 6.2%). Significant differences were found in three provinces where head of households indicated that alcohol in their households was a serious problem. This was observed in Gauteng where a higher proportion of head of households (12.5%) indicated that the misuse of alcohol in their households was a serious problem when compared to the Eastern Cape (4.6%) and Northern Cape (4.1%). An analysis by race showed differences among race groups. Significantly more heads of white households (84.1%) indicated that did they did not perceive any problem of misuse of alcohol in their households when compared to the heads of both black African households (57%) and Indian households (58.6%).

In addition, significantly more African and Indian heads of households (22.9% and 34, 3% respectively) indicated that the misuse of alcohol in their households was not a very serious problem compared to the white and coloured heads of households (7.3% and

Figure 3.5.2.1: Perceived seriousness of problems of alcohol misuse amongst members of the household, South Africa 2012

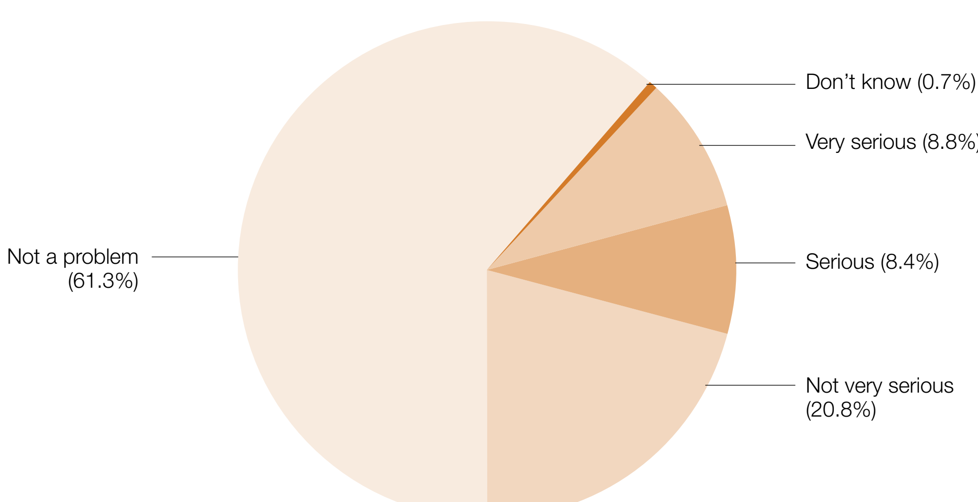


Table 3.5.2.2: Perceived seriousness of problems of alcohol misuse amongst members of the household by locality, province and race, South Africa 2012 (n = 2 410)

Background characteristics	Very serious		Serious		Not very serious		Not a problem		Don't know		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Locality											
Urban formal	7.4	[5.4–10.1]	8.2	[6.0–11.3]	19.6	[15.6–24.3]	64.5	[58.2–70.3]	0.3	[0.1–1.2]	1 354
Urban informal	14.9	[10.9–19.9]	13.2	[8.6–19.9]	22.6	[17.8–28.2]	47.3	[40.1–54.5]	2.1	[0.9–4.5]	298
Rural formal	10.7	[7.7–14.5]	7.2	[5.0–10.3]	24.9	[20.6–29.7]	56.8	[50.7–62.6]	0.5	[0.1–2.2]	441
Rural informal	6.5	[4.0–10.3]	8.3	[5.6–12.2]	15.8	[11.2–21.9]	67.3	[59.5–74.2]	2.1	[0.9–5.1]	317
Province											
Western Cape	6.2	[4.1–9.1]	6.4	[3.1–12.9]	17,0	[6.8–36.4]	70.3	[48.7–85.5]	0.2	[0.0–1.2]	383
Eastern Cape	10.0	[6.3–15.4]	4.6	[2.6–7.9]	23.6	[18.1–30.2]	61.2	[52.8–68.9]	0.7	[0.2–2.2]	326
Northern Cape	6.7	[2.4–17.0]	4.1	[2.2–7.5]	18.6	[11.2–29.2]	67.4	[50.7–80.6]	3.3	[0.5–19.6]	181
Free State	5.3	[2.1–12.7]	7.6	[4.5–12.5]	26.9	[20.5–34.5]	59.3	[50.6–67.4]	0.9	[0.3–2.8]	227
KwaZulu-Natal	9.3	[6.0–14.1]	8.4	[5.1–13.4]	28.2	[21.4–36.2]	53.3	[44.0–62.4]	0.9	[0.3–2.3]	348
North West	6.9	[4.0–11.5]	4.9	[2.5–9.3]	23.9	[17.2–32.3]	64.3	[54.8–72.7]	0.0		236
Gauteng	8.1	[4.9–12.9]	12.5	[8.3–18.3]	16.6	[12.3–22.1]	62.4	[54.0–70.2]	0.4	[0.1–2.9]	352
Mpumalanga	24.0	[14.5–37.2]	7.9	[4.6–13.5]	20.9	[15.1–28.3]	46.6	[36.7–56.7]	0.5	[0.1–3.7]	188
Limpopo	9.6	[5.3–16.8]	9.5	[5.0–17.2]	15.0	[9.8–22.1]	64.4	[52.8–74.6]	1.5	[0.4–5.5]	169
Race											
African	9.6	[7.8–11.8]	9.7	[7.8–12.1]	22.9	[19.7–26.5]	57.0	[52.3–61.6]	0.7	[0.4–1.3]	1 545
White	3.2	[0.8–11.4]	4.6	[1.6–12.5]	7.3	[3.3–15.3]	84.1	[73.1–91.1]	0.8	[0.2–2.7]	190
Coloured	6.8	[4.3–10.6]	3.8	[2.5–5.8]	15.1	[11.7–19.2]	74.0	[68.6–78.8]	0.2	[0.0–1.5]	511
Asian/Indian	5.4	[1.2–20.4]	1.7	[0.5–5.1]	34.3	[21.7–49.6]	58.6	[47.6–68.9]	0.0		124
Total	8.8	[7.2–10.6]	8.4	[6.8–10.4]	20.8	[18.1–23.8]	61.3	[57.3–65.2]	0.7	[0.4–1.2]	2 410

95% CI: 95% confidence interval

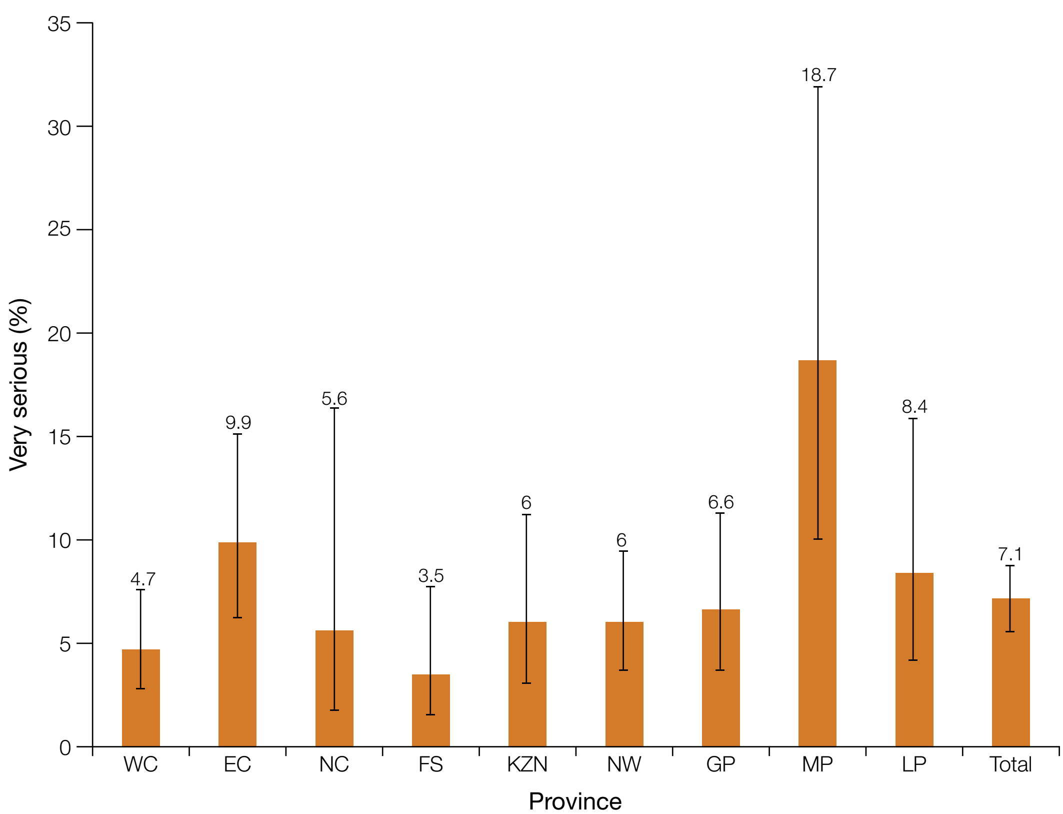
15.1% also respectively). Significantly more black African heads of households (9.7%) than Indian households (1.7%) and coloured households (3.8%) indicated that the misuse of alcohol in their households was a serious problem.

Perceptions of seriousness of violence or disturbances due to alcohol abuse

When household heads who had previously indicated household alcohol consumption were asked 'How serious is the problem of violence or disturbances due to alcohol use in your home?' the majority (68.6%, 95% CI: 65.4–71.7) indicated that violence or disturbances due to alcohol abuse in households was not a problem in their households. About 15%, (95%CI: 13.0–17.3) also of household heads indicated that violence or disturbances due to alcohol abuse was not a very serious problem for their households at all. Thus, the overwhelming majority of the household heads (83.6%, that is to say, 68.6% + 15%) did not perceive the problem of violence or disturbances due to alcohol use in their homes. An analysis by locality and race showed that there were no significant differences. Only 7.0% (95% CI: 5.6–8.8) and 8.5% (95% CI: (6.7–10.6) household heads (a total of 15.4% overall) reported that violence due to alcohol abuse was a very serious problem and serious problem respectively in their households.

Figure 3.5.2.2 shows perceived seriousness of violence or disturbances due to alcohol abuse in households by province. The results show that a significantly higher proportion of household heads in Mpumalanga experienced violence or disturbances due to alcohol abuse in their households (18.7%) as being very serious when compared to perceptions held by household heads in Western Cape (4.7%), Free State (3.5%) and North West (6%).

Figure 3.5.2.2: Perceived seriousness of violence or disturbances due to alcohol abuse in the household by province, South Africa 2012



Snacking while drinking alcohol in household

The results presented in Table 3.5.2.3 and Figures 3.5.2.3 and 3.5.2.4 show the extent of consumption of food and snacks while consuming alcohol in the households. The analysis is based on locality type, province and race. Overall, a majority of the heads of households (67.1%) indicated that snacking occurs while people in their households are drinking alcohol. In terms of locality, significantly more heads of households in urban formal (71%), urban informal (63.5%) and rural informal areas (74.2%) indicated that they did so than among those from formal rural (farms) areas (56.2%). With regards to provinces, Western Cape (82%) had the significantly highest reported level of snacking compared to all provinces except Mpumalanga and Northern Cape while Limpopo (46.8%) was the lowest; however this was significantly lower only compared to Western Cape, Northern Cape (73.9%), Free State (70.2%), KwaZulu-Natal (68.1%) and Mpumalanga (71.2%). Analysis by race suggests that significantly more white (80.7%) and coloured (82.6%) heads of households indicated that members of their households consumed food or snacks while drinking alcohol than did their African counterparts (63.4%).

Table 3.5.2.3: Extent of snacking while drinking alcohol in households by locality, South Africa 2012

Background characteristics	Yes		No		Don't know		Total
	%	95% CI	%	95% CI	%	95% CI	N
Locality							
Urban formal	71.0	[66.4–75.1]	20.8	[16.9–25.4]	8.2	[5.9–11.3]	1 343
Urban informal	63.5	[55.8–70.6]	27.4	[20.6–35.4]	9.1	[5.4–15.0]	287
Rural formal	56.2	[49.1–63.1]	30.1	[24.2–36.8]	13.6	[10.0–18.4]	436
Rural informal	74.2	[66.8–80.4]	22.1	[16.5–28.9]	3.7	[1.8–7.7]	318
Total	67.1	[63.8–70.2]	23.7	[20.8–26.8]	9.2	[7.4–11.4]	2 384

95% CI: 95% confidence interval

Figure 3.5.2.3: Extent of snacking while drinking alcohol in households by province, South Africa 2012

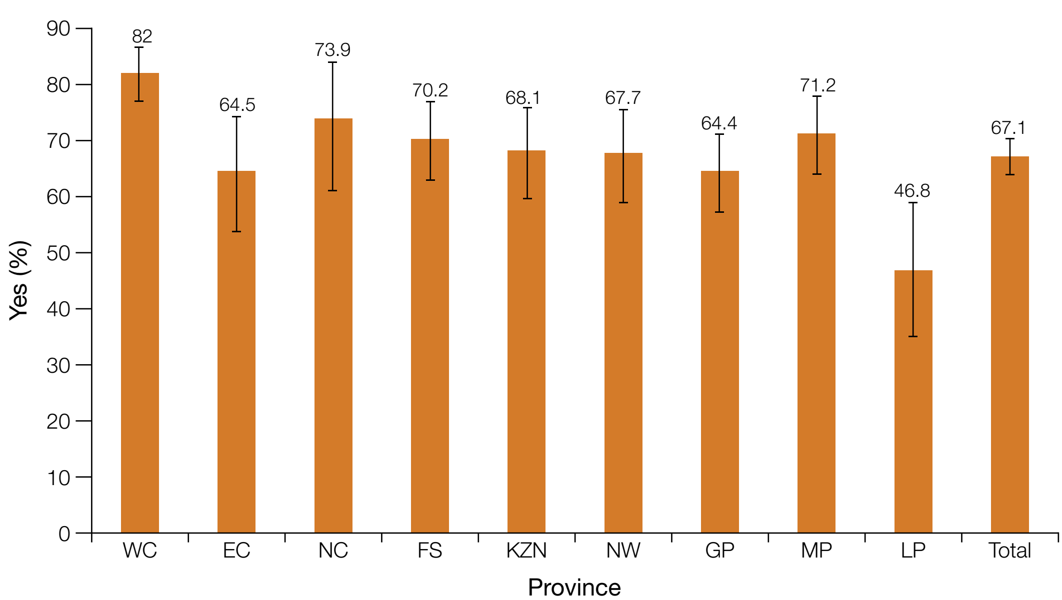
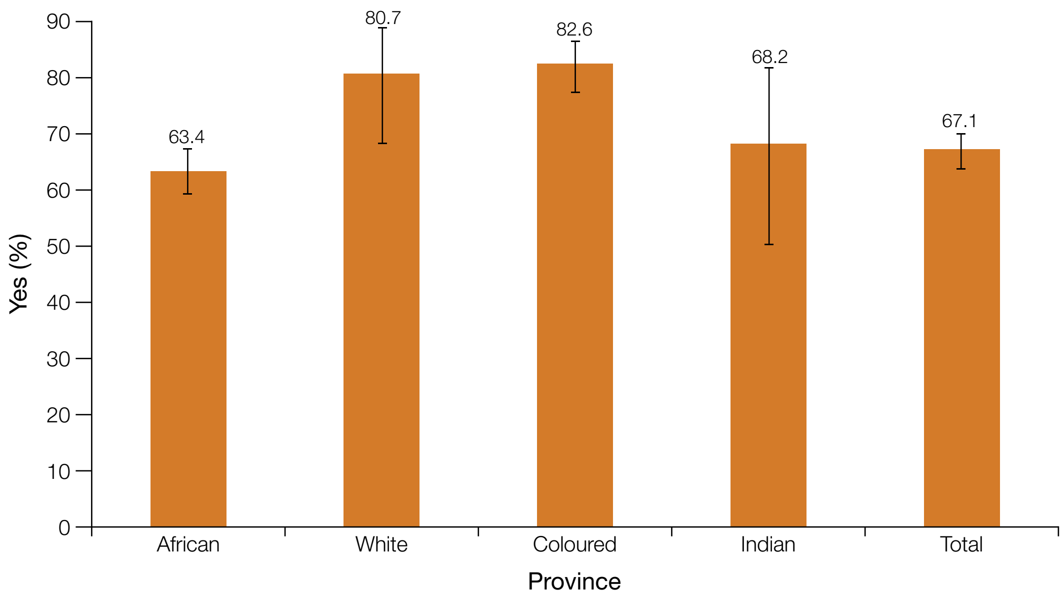


Figure 3.5.2.4: Extent of snacking while drinking alcohol in households by race, South Africa 2012



Discussion

The main findings of this study show that more than half of South African households did not have someone who consumed alcohol. These findings are consistent with what was found in previous surveys (Parry et al. 2005, Peltzer & Ramlagan 2006, Peltzer et al. 2011). As has been observed in previous surveys, significantly more adult males drank alcohol compared to females (Shisana et al. 2005). It was also observed that very few teenage boys and girls were reported to drink alcohol. Similar findings have also been reported in the YRBS findings of 2002, 2008 and 2011 (see Reddy et al. 2002, 2010, 2013).

Interestingly although alcohol consumption has been reported to be prevalent in South Africa (Parry et al. 2005; Peltzer & Ramlagan 2006; Peltzer et al. 2011) in the current study alcohol misuse was generally not perceived as a serious problem in most homes except in urban informal areas in Mpumalanga and among black African and Indian households. As seen in the literature review, alcohol has been associated with violence and gender violence in particular. A study of married or cohabiting construction workers and their spouses or partners found that stressors, hazardous drinking, and couple individualities interact to impact normative beliefs around partner violence and, thereafter, its occurrence (Kantor & Straus 1989, White & Chen 2002). According to a study conducted by Kliewer and Zaharakis (2013), witnessing violence is also associated with increased alcohol use over time in urban female caregivers. However, the results of this study suggested that there are very few incidences of violence or disturbances experienced in the household of the participants due to reported alcohol misuse in households. It must be taken into consideration, however, that the questions on alcohol were asked of the household head. Therefore, rates of perceptions of alcohol misuse and rates of perceptions of violence or disturbances experienced in a household due to reported alcohol misuse may not include incidences when the household head him or herself is the one misusing alcohol or acting as a perpetrator of violence because of alcohol misuse.

The finding that the misuse of alcohol was considered a very serious problem in Mpumalanga was unexpected. Previous research by Parry et al. (2005) and Peltzer et al.

(2011) has shown that the level of alcohol (mis)use tends to be higher in urban areas than in rural ones. Peltzer et al. (2011) also showed that binge drinking and hazardous or harmful drinking occurs more in urban than rural areas. Therefore, there is a need to investigate further why the misuse of alcohol was considered a very serious problem in Mpumalanga in the present study.

The observation that misuse of alcohol was considered not to be a problem by white heads of households when compared to those who are black Africans and Indians is also not surprising. This is because although whites drink the most frequently they do so mainly at low-risk levels including during meals (Peltzer et al. 2011; Shisana et al. 2005; 2009). A possible explanation of why black African head of households perceive the problem of misuse of alcohol in their households to be very serious has to do with the high levels of binge drinking and hazardous or harmful drinking (Peltzer et al. 2011; Shisana et al. 2005, 2009). It was however surprising that coloured heads of households did not perceive the the misuse of alcohol in their households as a very serious problem at a significantly higher rate than did whites since previous research suggests that their men have the highest levels of binge drinking and hazardous or harmful drinking in the country (Peltzer et al. 2011; Shisana et al. 2005, 2009).

The finding that most household heads reported that the members of their households consume food or snacks while drinking alcohol is not surprising. However, snacking was significantly lower among households in rural formal areas, black Africans and from Limpopo. As noted above, alcohol may increase food consumption or snacking, which can have a positive effect in reducing intoxication and a negative impact on one's health if the snacking contains predominantly unhealthy foods. For example, ChungShil, JoungWon and WhaJin (2000) found that alcohol drinking increased snacking and the intakes of energy, protein, dietary fibre, vitamin A, B1, B6, Fe and P. In the current study, whites were more likely to consume food or snacks while drinking alcohol. The findings in this report are consistent with evidence that suggests that there is an association between race, snacking, meal replacement and alcohol use, as it was found that black Africans snacked less when consuming alcohol compared to whites and coloureds. This could be explained by previous research that has found that in racialised populations high-risk drinkers and those who have alcohol dependency frequently replace meals with alcohol (Jacobs & Steyn 2013). This is of concern as it increases the likelihood of becoming intoxicated and causing damage to the body. A New York City study showed that drinkers of both sexes who mainly consumed alcohol without food were less educated and current smokers (Stranges et al. 2006). This provides insight for the lower likelihood of snacking while drinking for black Africans, as a racialised population with lower rates of education. Additional explanations could shed light on why black Africans are less likely to snack while drinking, potentially replacing meals with alcohol, such as poverty, food insecurity, racism and oppression, and so forth.

Increased snacking while drinking in the Western Cape is generally consistent with the current study and previous findings regarding whites and coloureds having a higher likelihood of snacking while drinking, as many whites and coloureds live in the Western Cape (see Peltzer et al. 2011; Shisana et al. 2005, 2009). However, there is a need for further investigation into the lower likelihood of snacking while consuming alcohol among black Africans, households in rural formal (farm) areas, and households in Limpopo because of the concern that these populations are replacing meals with alcohol (Jacobs & Steyn 2013). In conclusion, although the study suggests that in the majority of household alcohol use was not a problem, there are pockets of challenges oberserved in specific provinces and race groups that suggest a need for further investigations and intervention.

3.6 Nutritional status of adults

3.6.1 Vitamin A status of females of reproductive age

Vitamin A deficiency (VAD) is an endemic nutritional disorder throughout much of the developing world, particularly affecting the health and survival of infants, young children, and pregnant and lactating females. These age and life-stage groups represent periods when both nutrition stress is high and diet likely to be chronically deficient in vitamin A (West 2003). Females of reproductive age are also prone to vitamin and mineral deficiencies and may provide insight into the magnitude of micronutrient deficiencies among newborns. It has been reported that approximately 19 million pregnant females are vitamin A deficient (WHO 2009). Health consequences of vitamin A deficiency include mild to severe (blinding) stages of xerophthalmia, and inadequate vitamin A levels in breast milk.

South Africa has implemented a national vitamin A supplementation (VAS) programme for children six months to five years of age and for post-partum females. In addition, a food fortification programme was enacted in 2003. The 2005 National Food Consumption Survey revealed very high levels of vitamin A deficiency among females of reproductive age (27.2%) based on the WHO recommended serum retinol levels of < 0.7 μmol/L (WHO 2011). The present SANHANES-1 survey assessed vitamin A status of this vulnerable group in order to track the impact of current national policy.

Serum vitamin A (retinol) concentrations of < 0.70 mmol/L have traditionally been considered indicative of deficiency based on empirical data from population-based studies that did not exclude the influence of inflammation on serum vitamin A levels. The findings of the 2005 National Food Consumption Survey, documented, however, that the presence of inflammation did not adversely impact on serum vitamin A levels. In adults, appropriate cut-off values < 0.70 mmol/L and < 1.05 mmol/L have been used for different purposes. In this survey, a serum vitamin A concentration of < 0.70 mmol/L, as defined by the WHO, has been used for both children and adults in the assessment of vitamin A status, as follows:
- Vitamin A deficient: serum retinol concentration < 0.70 μmol/L
- Vitamin A sufficient: serum retinol concentration ≥ 0.70 μmol/L.

The following prevalence cut-offs for low serum retinol (< 0.70 μmol/L) to define VAD in populations and its level of public health significance, were applied (WHO 2011):

Degree of public health problem	Mild	Moderate	Severe
Prevalence of low serum retinol (< 0.70 μmol/L)	2–9%	10–19%	20% or more

Results

Overall, South African females of reproductive age had a VAD prevalence of 13.3%, reflecting a moderate public health problem of VAD (Table 3.6.1.1). Although the group 16–25 years of age had lower mean serum retinol concentrations (1.09 μmol/L compared to 1.10 μmol/L) and a lower prevalence of VAD (11.6% compared to 15.8%), these differences were not significant.

No significant urban–rural differences in mean retinol and VAD prevalence were found. However, the formal urban and rural formal areas had higher mean retinol concentrations and lower VAD prevalence, respectively. Western Cape had the highest mean retinol (1.24 μmol/L) and Limpopo the lowest (0.98 μmol/L), Gauteng second lowest

(1.03 µmol/L) and Mpumalanga third lowest (1.04 µmol/L). The difference between the highest and the three lowest means was significant. Further, VAD prevalence was the lowest in Western Cape (7.1%) and differed significantly compared to Mpumalanga, which had the highest VAD prevalence (22.8%) among the provinces. There was a trend for the mean serum retinol concentrations inversely reflected the VAD prevalence, with the exception of Northern Cape, which had the same mean retinol (though with wider 95% CI and fewer numbers) as Western Cape (1.24 µmol/L). Limpopo, with the lowest mean retinol concentrations had the second highest VAD prevalence at 20.4%. This province had the fewest participants, as well as the widest 95% CIs.

Sample numbers were very low for whites (n = 9) and Indians (n = 34), limiting comparisons between race groups. Coloured females had the highest mean retinol and lowest VAD prevalence, a significant finding when compared with black African females (serum concentration 1.27 µmol/L compared to 1.07 µmol/L and a prevalence of 7.2% compared to 14.4%, respectively).

Table 3.6.1.1: Mean serum vitamin A and vitamin A status among female participants aged 16 to 35 years by age, locality, province, and race, South Africa 2012

Background characteristics	Serum vitamin A µmol/L		Vitamin A < 0.7 µmol/L		Vitamin A ≥ 0.7 µmol/L		
	Mean	95% CI	%	95%CI	%	95%CI	Sample
Age group							
16–25 years	1.09	[1.06–1.13]	11.6	[8.8,15.1]	88.4	[84.9,91.2]	682
26–35 years	1.10	[1.03–1.17]	15.8	[9.6,24.7]	84.2	[75.3,90.4]	476
Total	1.10	[1.06–1.14]	13.3	[9.9,17.5]	86.7	[82.5,90.1]	1 158
Locality							
Urban formal	1.13	[1.06–1.19]	12.4	[7.1,20.7]	87.6	[79.3,92.9]	534
Urban informal	1.03	[0.93–1.13]	14.4	[8.3,23.8]	85.6	[76.2,91.7]	177
Rural formal	1.17	[1.09–1.24]	11.5	[7.7,16.9]	88.5	[83.1,92.3]	211
Rural informal	1.06	[1.00–1.12]	15.1	[10.5,21.2]	84.9	[78.8,89.5]	236
Total	1.10	[1.06–1.14]	13.3	[9.9,17.5]	86.7	[82.5,90.1]	1 158
Province							
Western Cape	1.24	[1.16–1.31]	7.1	[4.6,10.9]	92.9	[89.1,95.4]	264
Eastern Cape	1.11	[1.02–1.21]	9.0	[5.1,15.3]	91.0	[84.7,94.9]	171
Northern Cape	*	*	*	*	*	*	94
Free State	1.12	[1.05–1.18]	8.1	[3.4,18.4]	91.9	[81.6,96.6]	116
KwaZulu-Natal	1.04	[0.94–1.14]	16.4	[9.8,26.3]	83.6	[73.7,90.2]	114
North West	1.15	[1.07–1.23]	8.8	[4.6,16.3]	91.2	[83.7,95.4]	167
Gauteng	1.03	[0.92–1.15]	17.8	[8.1,34.7]	82.2	[65.3,91.9]	106
Mpumalanga	*	*	*	*	*	*	81
Limpopo	*	*	*	*	*	*	45
Total	1.10	[1.06–1.14]	13.3	[9.9,17.5]	86.7	[82.5,90.1]	1 158
Race							
African	1.07	[1.02–1.11]	14.4	[10.5,19.5]	85.6	[80.5,89.5]	781
Coloured	1.27	[1.21–1.34]	7.2	[4.3,11.9]	92.8	[88.1,95.7]	331
Total	1.10	[1.06–1.14]	13.3	[10.0,17.6]	86.7	[82.4,90.0]	1 155

95% CI: 95% confidence interval

** Too few observations to record reliably*

Discussion

It is almost ten years since vitamin A supplementation (2002) and food fortification (2003) were implemented in South Africa, and about seven years since the last national food consumption survey (NFCS–2005) (Labadarios 2007) when vitamin A status was last assessed in females. A comparison with the current SANHANES-1 results shows that among females of reproductive age, a decrease in the national prevalence of VAD by more than 50% (13.3% compared to 27.2%) was documented together with an increase in the mean serum retinol levels, 0.96 µmol/L, compared with the present 1.10 µmol/L.

As with the 2005 survey, females in formal urban and rural formal areas of residence had the lowest VAD prevalence and the highest mean retinol concentrations. There was, however, an overall improvement for all localities compared to NFCS 2005. Mean retinol and VAD improved in all the provinces, except for Mpumalanga and Northern Cape. The 2005 sample numbers for Northern Cape were low at 32 participants and could have influenced the results. Limpopo, while showing a slight increase in mean retinol, had the second highest VAD prevalence of the provinces – the sample number was small at 45 compared to 161 in 2005. Coloured females had significantly higher mean retinol levels compared to black African females, 1.27 µmol/L compared to 1.07 µmol/L. If one discounts the two groups with the low numbers of participants, then VAD was most prevalent among the majority of the black African group of females.

It is encouraging to note the improved vitamin A status, more so among females of reproductive age, over the past decade. There has been a marked improvement in vitamin A status among females in KwaZulu-Natal, but deterioration in those from Mpumalanga. In the case of the latter, VAS is unlikely to have made an impact on VAD since the supplementary dose is not high enough and of insufficient duration. In this regard, the 2011 WHO guidelines (WHO 2011a) on VAS state that supplementation in pregnant and post–partum females is not recommended for the prevention of maternal and infant morbidity and mortality. The National Department of Health decided to stop post-partum VAS in August 2012 (Department of Health Circular 2012). This decision needs to be reviewed in light of the present findings, which, though showing an improvement in vitamin A status, they also indicate VAD of moderate public health importance among females of reproductive age. The cessation of post-partum VAS may impact on the transfer of retinol to young infants via breast milk, and hence their vitamin A status. What is disconcerting, however, is that South African females have lower mean retinol levels (1.10 µmol/L) than those found in Ghana (1.54 µmol/L in non-pregnant and 1.15 µmol/L in pregnant females) (Kirkwood 2010), Nepal (1.15 µmol/L in pregnant females) (West 1999), Vietnam (1.49 µmol/L) (Arnoud L 2012), Brazil (1.61 µmol/L in post–partum females) (Andreto 2012), and Iran (2.38 µmol/L) (Jafari 2013).

Finally, it should be remembered that optimal breast feeding of infants and young children and consumption of an adequate and varied diet with vitamin A-rich foods by both females and children, combined with other health improvement measures such as control of infectious diseases, are the best strategies for avoiding vitamin A deficiency. Furthermore, the current policy on food fortification should continue despite recent evidence (Awasthi, Peto, Read et al. 2013) that vitamin A status may have only a modest effect on child mortality.

3.6.2 Anaemia and iron status of adults

Anaemia is one of the most common and intractable nutritional problems in the world today (WHO 2007). Some two billion people are anaemic, defined as haemoglobin (Hb) levels below recommended thresholds (WHO 2011). Although dietary iron deficiency is probably the most common cause of anaemia, other causes include blood loss, such as from heavy menstrual bleeding, gastrointestinal ulceration; acute and chronic infections that cause inflammation (for example, HIV, TB, malaria, hookworm infections and schistosomiasis); deficiencies of other key micronutrients including folate, vitamin B12 and vitamin A; or inherited traits that affect red blood cells, such as thalassemia.

Although men can also suffer the consequences of mineral and vitamin deficiencies, they tend to be less affected compared to pre-school children and women of reproductive age. The prevalence of anaemia in men can be used to estimate the role of iron deficiency as a cause of anaemia in women and children. When the prevalence of anaemia is high in women and children but low in men, iron deficiency is likely to be a major contributing factor to the high prevalence of anaemia in women and children. If anaemia prevalence is high in all three groups, causes of anaemia other than iron deficiency anaemia (IDA) are likely to be contributing to the anaemia (Gorstein 2007).

In the adult population, anaemia has been reported to be a risk factor for cardiovascular health and early death. In addition, it also causes fatigue and results in a negative impact on cognitive and physical functions as well as on the quality of life. Most existing studies point out that anaemia among women causes increased risk of low birth weight, inadequate iron stores for the newborn, higher risk of maternal morbidity and mortality as well as a decline in mental concentration and physical activity. Although it was believed that a decline in haemoglobin levels might be a normal consequence of ageing, evidence has accumulated that anaemia does reflect poor health and increased vulnerability to adverse outcomes in older persons (Pratima 2012).

Women of reproductive age are at increased risk of anaemia because of chronic iron depletion during the menstrual cycle. It is estimated that worldwide there are 469 million anaemic women of reproductive age. At least half of the cases are attributed to iron deficiency (WHO 2011a). It is estimated that the global prevalence of anaemia in non-pregnant women is 29% (Stevens 2013). Anaemia in women of reproductive age is usually diagnosed when the haemoglobin concentration in the blood is below 12g/dL (WHO 2011). Women entering pregnancy with suboptimal iron reserves may be at higher risk of negative maternal and neonatal outcomes (Viteri 2005).

The prevalence of anemia as a problem of public health significance can be classified as follows (WHO/CDC 2008):

- ≤ 4.9%, no public health problem;
- 5–19.9%, mild public health problem;
- 20–39.9%, moderate public health problem;
- ≥ 40%, severe public health problem

The following are the recommended cut-offs for defining anaemia in populations (WHO/CDC 2011):

Hb cut-offs for men

Mild anaemia	Moderate anaemia	Severe anaemia
Hb 12.9–11.0 g/dL	Hb 10.9–8.0 g/dL	Hb < 8.0 g/dL

Hb cut-offs for women (non-pregnant)

Mild anaemia	Moderate anaemia	Severe anaemia
Hb 11.9–11.0 g/dL	Hb 10.9–8.0 g/dL	Hb < 8.0 g/dL

Serum ferritin measurements were also determined in the survey and the following cut-offs were applied for the diagnosis of iron status (WHO 2011b):

Iron deficiency (ID): Ferritin < 15 ng/mL and Hb > 12 g/dL
Iron deficiency anaemia (IDA): Ferritin < 15 ng/mL and Hb < 12 g/dL

Results

The prevalence of anaemia in adult participants is summarised in the next section.

Anaemia in adults

Overall, the prevalence of anaemia in all participants older than 15 years of age was 17.5% with female participants having almost double the prevalence (22.0%) when compared with males (12.2%). Similarly, the prevalence of mild, moderate, and severe anaemia was respectively 11.6%, 5.3% and 0.6% with an overall statistically significant sex difference.

Mean Hb in adult males was 14.7 g/dL and the prevalence of anaemia 12.2%, mild anaemia was present in 10.6%, moderate in 1.5% and severe anaemia in 0.2% of males (Table 3.6.2.1). Men 35–44 years of age had the highest mean Hb (14.9 g/dL) and the lowest prevalence of anaemia (7.0%), while those 65 years of age and older had the lowest Hb (13.7 g/dL) and the highest anaemia prevalence (25.9%).

Informal urban and informal rural areas had the lowest mean Hb levels, 14.2 and 14.3 g/dL, respectively. They were both significantly lower than urban formal areas (15.0 g/dL). Northern Cape had the highest mean Hb level (15.3 g/dL) and the lowest anaemia prevalence (3.5%). KwaZulu Natal had the lowest mean Hb level (14.2 g/dL) while anaemia was most prevalent among males from Mpumalanga (18.6%).

Small sample sizes in the white and Asian/Indian groups limited comparisons between race groups. Mean Hb was similar in the coloured and black African groups (14.9 g/dL and 14.7 g/dL respectively). Anaemia prevalence was significantly lower in the coloured group (6.8%) compared to 12.9% in the black African group. There were no significant differences with regard to the severity of anaemia in the two race groups.

Overall, mean Hb was 12.9 g/dL and anaemia prevalence 22.0%; mild anaemia was present in 12.4%, moderate in 8.5% and severe anaemia in 1.1% of females.

Unlike the case in males, females 55–64 years of age had the highest mean Hb (13.2 g/dL) and the lowest prevalence of anaemia (15.9%), while those 25–34 years of age had the lowest Hb (12.7 g/dL) and the highest anaemia prevalence at 24.7% (Table 3.6.2.2).

Informal urban and informal rural areas had the lowest mean Hb levels, 12.6 and 12.7 g/dL, respectively. The mean Hb of females in urban informal areas was statistically significantly lower than those living in rural formal areas. Northern Cape had the highest mean Hb level (13.4 g/dL) and the lowest anaemia prevalence (11.7%). KwaZulu-Natal and Limpopo had the lowest mean Hb (12.4 g/dL and 12.5 g/dL) and the highest and second highest anaemia prevalence of all the provinces, 33.1% and 30.3%, respectively.

Table 3.6.2.1: Severity of anaemia among male participants aged 15 and older by age, locality, province and race, South Africa 2012

Background characteristics	Presence of anaemia												
	Mean levels of Hb		Anaemia detected Hb <13 g/dL		No Anaemia detected Hb ≥ 13 g/dL		Mild anaemia Hb 11–12.9 g/dL		Moderate anaemia Hb 8–10.9 g/dL		Severe anaemia Hb < 8 g/dL		Sample
	Mean	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age													
15–24	14.6	[14.4–14.7]	9.3	[6.8–12.6]	90.7	[87.4–93.2]	8.2	[5.9–11.4]	1.1	[0.4–3.1]	0.0		566
25–34	15.4	[14.9–15.9]	9.6	[5.3–16.8]	90.4	[83.2–94.7]	7.6	[3.9–14.5]	1.8	[0.6–5.0]	0.2	[0.0–1.7]	287
35–44	14.9	[14.7–15.1]	7.0	[4.1–11.7]	93.0	[88.3–95.9]	6.5	[3.7–11.3]	0.5	[0.1–2.1]	0.0		254
45–54	14.9	[14.6–15.2]	11.3	[5.7–21.0]	88.7	[79.0–94.3]	10.6	[5.2–20.5]	0.6	[0.1–4.4]	0.0		282
55–64	14.5	[14.1–14.9]	16.3	[10.5–24.6]	83.7	[75.4–89.5]	14.0	[8.4–22.4]	2.3	[0.7–7.3]	0.1	[0.0–0.7]	257
65+	13.7	[13.5–14.0]	25.9	[18.3–35.3]	74.1	[64.7–81.7]	21.7	[14.3–31.5]	3.3	[1.5–7.0]	0.9	[0.2–3.7]	243
Total	14.7	[14.5–14.9]	12.2	[10.1–14.7]	87.8	[85.3–89.9]	10.6	[8.6–13.0]	1.5	[0.9–2.4]	0.2	[0.1–0.5]	1 889
Locality													
Urban formal	15.0	[14.7–15.2]	10.5	[7.5–14.4]	89.5	[85.6–92.5]	9.4	[6.5–13.4]	1.0	[0.4–2.1]	0.1	[0.0–0.4]	921
Urban informal	14.2	[13.9–14.6]	15.7	[9.7–24.4]	84.3	[75.6–90.3]	13.9	[8.4–22.0]	1.8	[0.5–6.7]	0.0		197
Rural formal	14.7	[14.5–14.9]	14.3	[9.8–20.6]	85.7	[79.4–90.2]	13.6	[9.2–19.8]	0.7	[0.3–2.0]	0.0		351
Rural informal	14.3	[14.1–14.5]	13.8	[10.4–18.0]	86.2	[82.0–89.6]	10.8	[7.9–14.8]	2.6	[1.2–5.3]	0.4	[0.1–1.5]	420
Total	14.7	[14.5–14.9]	12.2	[10.1–14.7]	87.8	[85.3–89.9]	10.6	[8.6–13.0]	1.5	[0.9–2.4]	0.2	[0.1–0.5]	1 889
Province													
Western Cape	14.8	[14.6–15.0]	5.6	[3.4–9.0]	94.4	[91.0–96.6]	5.3	[3.2–8.6]	0.3	[0.1–1.3]	0.0		359
Eastern Cape	14.7	[14.4–14.9]	8.9	[5.3–14.6]	91.1	[85.4–94.7]	7.9	[4.5–13.4]	0.7	[0.1–3.0]	0.4	[0.1–2.6]	318
Northern Cape	15.3	[14.3–16.3]	3.5	[1.3–9.4]	96.5	[90.6–98.7]	2.4	[0.8–6.5]	1.2	[0.2–8.5]	0.0		121
Free State	15.0	[14.7–15.3]	10.9	[7.4–15.7]	89.1	[84.3–92.6]	8.9	[5.7–13.7]	2.0	[0.6–6.7]	0.0		175
KwaZulu-Natal	14.2	[14.0–14.5]	15.2	[10.6–21.3]	84.8	[78.7–89.4]	12.8	[8.7–18.6]	2.2	[1.0–5.1]	0.1	[0.0–0.6]	244
North West	14.8	[14.3–15.2]	13.4	[8.1–21.4]	86.6	[78.6–91.9]	7.4	[3.5–14.7]	5.2	[2.2–12.0]	0.8	[0.1–5.6]	224
Gauteng	15.0	[14.5–15.4]	13.4	[8.4–20.7]	86.6	[79.3–91.6]	12.8	[7.9–20.0]	0.6	[0.1–4.1]	0.0		185
Mpumalanga	14.5	[14.2–14.9]	18.6	[13.0–26.0]	81.4	[74.0–87.0]	17.4	[11.6–25.3]	0.6	[0.1–3.4]	0.7	[0.1–4.1]	165
Limpopo	*	*	*	*	*	*	*	*	*	*	*	*	98
Total	14.7	[14.5–14.9]	12.2	[10.1–14.7]	87.8	[85.3–89.9]	10.6	[8.6–13.0]	1.5	[0.9–2.4]	0.2	[0.1–0.5]	1 889
Race													
African	14.7	[14.5–14.9]	12.9	[10.6–15.6]	87.1	[84.4–89.4]	11.2	[9.0–13.8]	1.5	[0.8–2.6]	0.2	[0.1–0.6]	1 255
White	*	*	*	*	*	*	*	*	*	*	*	*	56
Coloured	14.9	[14.6–15.2]	6.8	[4.6–10.0]	93.2	[90.0–95.4]	6.2	[4.1–9.3]	0.6	[0.2–1.9]	0.0		474
Asian/Indian	*	*	*	*	*	*	*	*	*	*	*	*	97
Total	14.7	[14.5–14.9]	12.2	[10.1–14.7]	87.8	[85.3–89.9]	10.6	[8.6–13.0]	1.5	[0.9–2.4]	0.2	[0.1–0.5]	1 882

95% CI: 95% confidence interval

** Too few observations to record reliably*

Mean Hb concentration was highest in the coloured group (13.2 g/dL) and anaemia prevalence the lowest (12. 9%). White participants had too few observations for adequate interpretation. Black Africans and Indians had similar HB levels (12.8 g/dL, as well as anaemia prevalence, 23.5 and 25.4%, respectively. Moderate to severe anaemia was highest among black African (10.2%), then Indian (8.2%) and coloured females (7.0%).

Anaemia in women of reproductive age

Mean Hb was 12.8 g/dL and anaemia prevalence 23.1% in females 16–35 years of age, with the older women (26–35 years of age) having lower mean Hb (12.6 g/dL compared to 12.9 g/dL) and more anaemia than the younger group (24.2% compared to 22.3%) (Table 3.6.2.3). Combined moderate to severe anaemia was also more prevalent among the older group of women, 12.5% compared to 10.3%.

Although the differences were not significant, women living in urban informal areas had the lowest mean Hb concentration (12.5 g/dL), highest anaemia prevalence (31.5%) and combined moderate to severe anaemia (14.1%). North West had the highest mean Hb (13.2 g/dL) and Western Cape had the lowest anaemia prevalence (16.1%). Anaemia was most prevalent in KwaZulu-Natal (35.9%) and Mpumalanga (29.5%). Women from KwaZulu-Natal had the lowest mean Hb (12.4 g/dL), which was significantly lower than the other provinces, except for Gauteng (12.8 g/dL), Mpumalanga (12.5 g/dL) and Free State (13.1 g/dL). The prevalence of combined moderate to severe anaemia was lowest in North West (4.3%), followed closely by Eastern Cape (6.2%); Mpumalanga (15.2%), and KwaZulu-Natal (14.8%) had the highest prevalence.

Low sample numbers for white and Indian women of reproductive age precluded any comparison between the race groups. Nonetheless, black African women had significantly lower mean Hb (12.7 g/dL compared to 13.3 g/dL) and higher anaemia prevalence (24.8% compared to 13.2%) than coloured women.

Iron status in women of reproductive age

Overall, low serum ferritin (< 15 ng/mL) was present in 15.3% of women, with a mean ferritin of 65.3 ng/mL (Table 3.6.2.4). Mean ferritin and low serum ferritin were lower and higher, respectively, in the younger and older women of reproductive age (56.7 ng/mL compared to 78.1 ng/mL and 17.1% compared to 12.7%). Women from both formal and informal urban areas had lower ferritin concentrations (61.9 ng/mL and 63.4 ng/mL, respectively), but not significantly so, and higher prevalence of low serum ferritin (16.1% and 17.2%, respectively) than those living in rural areas. Mean ferritin was lowest in Mpumalanga (47.5 ng/mL), Gauteng (47.3 ng/mL), and Free State (55.1 ng/mL). Black African women had a significantly higher prevalence (16.7%) of low ferritin concentration when compared with coloured women (7.3%).

Overall, the prevalence of iron depletion (Table 3.6.2.5) was non-significantly higher among the younger female (6.9%) participants, and among residents of urban formal areas (7.0%). Provincially, the prevalence of iron depletion was the highest in Gauteng (11.2%) and lowest in Eastern Cape (0.7%) and Free State (2.0%). Black African (6.7%) women had a significantly higher prevalence of iron depletion compared to coloured women (1.3%).

Iron deficiency anaemia (IDA) (Table 3.6.2.5) was present in 9.7% of women of reproductive age in South Africa. The younger women had a higher prevalence of IDA (10.5 compared to 8.5%) and a lower prevalence of anaemia due to other causes (10.7 compared to 14.8%) than older women. Urban women had more IDA than rural women,

Table 3.6.2.2: Severity of anaemia among female participants aged 15 and older by age, locality, province and race, South Africa 2012

Background characteristics	Presence of anaemia						Severity of anaemia						
	Mean levels of Hb		Anaemia detected Hb <12 g/dL		No anaemia detected Hb ≥ 12 g/dL		Mild anaemia Hb 11–11.9 g/dL		Moderate anaemia Hb 8–10.9 g/dL		Severe anaemia Hb < 8 g/dL		Sample
	Mean	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age													
15–24	12.8	[12.7–13.0]	24.2	[20.2–28.7]	75.8	[71.3–79.8]	12.9	[10.2–16.4]	10.6	[8.0–13.9]	0.7	[0.3–1.5]	846
25–34	12.7	[12.5–12.8]	24.7	[20.4–29.6]	75.3	[70.4–79.6]	12.7	[9.3–17.0]	9.9	[7.2–13.4]	2.2	[0.8–5.8]	557
35–44	12.8	[12.6–13.0]	23.1	[17.7–29.5]	76.9	[70.5–82.3]	12.0	[8.6–16.6]	10.1	[6.8–14.7]	1.0	[0.4–2.5]	497
45–54	12.9	[12.7–13.1]	23.7	[18.1–30.3]	76.3	[69.7–81.9]	13.3	[8.2–20.8]	9.6	[6.3–14.3]	0.8	[0.3–2.1]	553
55–64	13.2	[13.0–13.4]	15.9	[11.2–21.9]	84.1	[78.1–88.8]	12.9	[8.6–19.0]	2.9	[1.7–5.0]	0.0		417
65+	13.0	[12.7–13.2]	17.0	[12.2–23.2]	83.0	[76.8–87.8]	9.4	[5.7–15.0]	5.6	[3.1–10.0]	2.0	[0.7–5.6]	429
Total	**12.9**	**[12.8–13.0]**	**22.0**	**[19.5–24.7]**	**78.0**	**[75.3–80.5]**	**12.4**	**[10.5–14.5]**	**8.5**	**[7.1–10.2]**	**1.1**	**[0.7–1.7]**	**3 299**
Locality													
Urban formal	13.0	[12.9–13.1]	19.3	[15.7–23.5]	80.7	[76.5–84.3]	11.0	[8.2–14.5]	6.9	[5.1–9.3]	1.4	[0.7–2.6]	1 589
Urban informal	12.6	[12.3–12.8]	31.2	[24.5–38.7]	68.8	[61.3–75.5]	17.9	[13.4–23.7]	12.8	[8.5–18.9]	0.4	[0.1–2.6]	396
Rural formal	13.1	[13.0–13.3]	15.6	[11.2–21.3]	84.4	[78.7–88.8]	7.9	[5.6–10.9]	7.2	[4.3–11.7]	0.5	[0.1–1.9]	525
Rural informal	12.7	[12.5–12.9]	24.9	[20.6–29.7]	75.1	[70.3–79.4]	13.9	[10.8–17.7]	10.0	[7.5–13.4]	0.9	[0.5–1.8]	789
Total	**12.9**	**[12.8–13.0]**	**22.0**	**[19.5–24.7]**	**78.0**	**[75.3–80.5]**	**12.4**	**[10.5–14.5]**	**8.5**	**[7.1–10.2]**	**1.1**	**[0.7–1.7]**	**3 299**
Province													
Western Cape	13.1	[13.0–13.3]	15.1	[12.0–18.8]	84.9	[81.2–88.0]	7.7	[5.3–11.0]	6.9	[5.0–9.4]	0.5	[0.1–3.5]	620
Eastern Cape	13.0	[12.8–13.2]	16.9	[12.7–22.1]	83.1	[77.9–87.3]	11.4	[8.1–16.0]	5.0	[3.2–7.6]	0.5	[0.1–1.8]	517
Northern Cape	13.4	[13.1–13.7]	11.7	[6.9–19.3]	88.3	[80.7–93.1]	6.3	[2.8–13.4]	5.2	[2.4–10.8]	0.3	[0.0–1.8]	211
Free State	13.1	[12.9–13.4]	16.8	[12.8–21.7]	83.2	[78.3–87.2]	8.2	[5.3–12.3]	8.1	[4.6–13.7]	0.5	[0.1–3.8]	261
KwaZulu-Natal	12.4	[12.2–12.6]	33.1	[25.7–41.5]	66.9	[58.5–74.3]	17.8	[12.9–24.1]	14.4	[9.7–20.8]	0.8	[0.2–3.5]	399
North West	13.3	[12.9–13.6]	16.8	[12.1–23.0]	83.2	[77.0–87.9]	11.2	[7.8–15.9]	3.6	[2.0–6.6]	2.0	[0.7–5.6]	438
Gauteng	13.0	[12.8–13.2]	20.6	[14.2–28.8]	79.4	[71.2–85.8]	12.3	[7.4–19.6]	7.0	[3.9–12.1]	1.3	[0.4–3.9]	330
Mpumalanga	12.6	[12.2–13.1]	25.1	[17.2–35.1]	74.9	[64.9–82.8]	12.0	[8.4–16.9]	11.2	[6.7–18.2]	1.9	[0.8–4.2]	311
Limpopo	12.5	[12.2–12.7]	30.3	[23.2–38.4]	69.7	[61.6–76.8]	15.9	[10.4–23.5]	12.8	[8.9–18.0]	1.6	[0.7–3.9]	212
Total	**12.9**	**[12.8–13.0]**	**22.0**	**[19.5–24.7]**	**78.0**	**[75.3–80.5]**	**12.4**	**[10.5–14.5]**	**8.5**	**[7.1–10.2]**	**1.1**	**[0.7–1.7]**	**3 299**
Race													
African	12.8	[12.7–12.9]	23.5	[20.6–26.7]	76.5	[73.3–79.4]	13.4	[11.2–15.9]	9.0	[7.3–11.0]	1.2	[0.7–1.9]	2 260
White	*	*	*	*	*	*	*	*	*	*	*	*	49
Coloured	13.2	[13.1–13.4]	12.9	[10.5–15.7]	87.1	[84.3–89.5]	5.9	[4.2–8.3]	6.9	[5.0–9.3]	0.1	[0.0–0.4]	829
Asian/Indian	12.8	[12.6–13.0]	25.4	[18.8–33.5]	74.6	[66.5–81.2]	17.2	[11.5–24.9]	7.7	[4.6–12.8]	0.5	[0.1–2.2]	157
Total	12.9	[12.8–13.0]	22.0	[19.5–24.7]	78.0	[75.3–80.5]	12.4	[10.5–14.5]	8.5	[7.1–10.2]	1.1	[0.7–1.7]	3 295

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.6.2.3: Severity of anaemia among female participants aged 16–35 by age, locality, province and race, South Africa 2012

Background characteristics	Presence of anaemia						Severity of anaemia						
	Mean levels of Hb		Anaemia Detected Hb <12 g/dL		No anaemia detected Hb ≥ 12 g/dL		Mild anaemia Hb 11–11.9 g/dL		Moderate anaemia Hb 8–10.9 g/dL		Severe anaemia Hb < 8 g/dL		Sample
	Mean	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age													
16–25	12.9	[12.7–13.0]	22.3	[18.5–26.7]	77.7	[73.3–81.5]	12.0	[9.4–15.1]	9.7	[7.1–13.2]	0.6	[0.3–1.4]	815
26–35	12.6	[12.5–12.8]	24.2	[19.2–30.0]	75.8	[70.0–80.8]	11.7	[8.3–16.1]	10.6	[7.7–14.3]	1.9	[0.7–5.6]	544
Total	12.8	[12.7–12.9]	23.1	[19.9–26.6]	76.9	[73.4–80.1]	11.8	[9.6–14.5]	10.1	[7.9–12.8]	1.2	[0.5–2.5]	1 359
Locality													
Urban formal	12.9	[12.7–13.1]	19.0	[14.7–24.3]	81.0	[75.7–85.3]	9.4	[6.6–13.2]	8.1	[5.3–12.2]	1.5	[0.5–4.5]	612
Urban informal	12.5	[12.3–12.8]	31.5	[24.0–40.1]	68.5	[59.9–76.0]	17.4	[11.7–25.2]	13.7	[7.7–23.3]	0.4	[0.1–2.5]	213
Rural formal	12.9	[12.5–13.2]	17.9	[11.9–26.0]	82.1	[74.0–88.1]	5.8	[3.2–10.3]	11.0	[5.9–19.6]	1.1	[0.3–4.1]	241
Rural informal	12.7	[12.4–12.9]	28.2	[22.1–35.2]	71.8	[64.8–77.9]	15.7	[11.2–21.6]	11.6	[7.9–16.8]	0.9	[0.3–2.7]	293
Total	12.8	[12.7–12.9]	23.1	[19.9–26.6]	76.9	[73.4–80.1]	11.8	[9.6–14.5]	10.1	[7.9–12.8]	1.2	[0.5–2.5]	1 359
Province													
Western Cape	13.1	[12.9–13.3]	16.1	[12.3–20.9]	83.9	[79.1–87.7]	7.4	[4.5–11.8]	8.8	[5.9–12.8]	0.0		274
Eastern Cape	13.0	[12.8–13.2]	19.9	[14.3–26.9]	80.1	[73.1–85.7]	13.7	[9.3–19.7]	6.2	[3.4–11.1]	0.0		179
Northern Cape	*	*	*	*	*	*	*	*	*	*	*	*	83
Free State	13.1	[12.7–13.4]	17.6	[11.6–25.8]	82.4	[74.2–88.4]	10.4	[4.7–21.3]	7.2	[3.2–15.6]	0.0		113
KwaZulu-Natal	12.4	[12.1–12.7]	35.9	[26.8–46.1]	64.1	[53.9–73.2]	21.0	[13.8–30.8]	14.4	[8.2–24.2]	0.4	[0.1–2.3]	152
North West	13.2	[12.8–13.5]	16.9	[10.3–26.6]	83.1	[73.4–89.7]	12.6	[6.9–21.8]	3.0	[1.0–8.4]	1.3	[0.2–7.8]	170
Gauteng	12.8	[12.6–13.1]	18.6	[12.2–27.4]	81.4	[72.6–87.8]	7.7	[4.3–13.3]	8.5	[4.5–15.4]	2.5	[0.8–7.4]	160
Mpumalanga	12.5	[12.1–13.0]	29.5	[18.0–44.5]	70.5	[55.5–82.0]	14.3	[8.3–23.5]	13.8	[6.4–27.4]	1.4	[0.4–4.9]	145
Limpopo	*	*	*	*	*	*	*	*	*	*	*	*	83
Total	12.8	[12.7–12.9]	23.1	[19.9–26.6]	76.9	[73.4–80.1]	11.8	[9.6–14.5]	10.1	[7.9–12.8]	1.2	[0.5–2.5]	1 359
Race													
African	12.7	[12.6–12.8]	24.8	[21.1–28.9]	75.2	[71.1–78.9]	12.8	[10.3–16.0]	10.6	[8.1–13.7]	1.3	[0.6–2.9]	953
White	*	*	*	*	*	*	*	*	*	*	*	*	12
Coloured	13.3	[13.1–13.5]	13.2	[9.7–17.8]	86.8	[82.2–90.3]	4.9	[2.9–8.2]	8.2	[5.4–12.1]	0.2	[0.0–1.1]	344
Asian/Indian	*	*	*	*	*	*	*	*	*	*	*	*	47
Total	12.8	[12.7–12.9]	23.1	[19.9–26.7]	76.9	[73.3–80.1]	11.9	[9.6–14.5]	10.1	[7.9–12.8]	1.2	[0.5–2.5]	1 356

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.6.2.4: Mean serum ferritin and percentage of female participants aged 16–35 years with low ferritin values by age, locality, province and race, South Africa 2012

Females of reproductive age							
Background characteristics	Mean ferritin		Ferritin <15 ug/L		Ferritin ≥ 15 ug/L		Sample
	Mean	95% CI	%	95% CI	%	95% CI	n
Age							
16–25	56.7	[43.4–69.9]	17.1	[13.5–21.5]	82.9	[78.5–86.5]	730
26–35	78.1	[67.5–88.6]	12.7	[9.2–17.2]	87.3	[82.8–90.8]	493
Total	65.3	[56.1–74.4]	15.3	[12.6–18.5]	84.7	[81.5–87.4]	1 223
Locality							
Urban formal	61.9	[47.4–76.4]	16.1	[12.2–21.0]	83.9	[79.0–87.8]	580
Urban informal	63.4	[43.6–83.1]	17.2	[10.1–27.7]	82.8	[72.3–89.9]	194
Rural formal	75.5	[60.6–90.5]	12.2	[7.8–18.7]	87.8	[81.3–92.2]	231
Rural informal	70.1	[55.2–85.1]	13.5	[9.3–19.2]	86.5	[80.8–90.7]	218
Total	65.3	[56.1–74.4]	15.3	[12.6–18.5]	84.7	[81.5–87.4]	1 223
Province							
Western Cape	101.9	[57.5–146.3]	8.2	[4.5–14.3]	91.8	[85.7–95.5]	264
Eastern Cape	88.5	[74.7–102.4]	3.9	[1.6–9.5]	96.1	[90.5–98.4]	178
Northern Cape	*	*	*	*	*	*	93
Free State	55.1	[45.5–64.7]	10.0	[5.2–18.5]	90.0	[81.5–94.8]	117
KwaZulu-Natal	61.0	[36.0–86.1]	17.5	[9.9–28.9]	82.5	[71.1–90.1]	107
North West	63.5	[52.1–74.8]	5.2	[2.9–9.2]	94.8	[90.8–97.1]	174
Gauteng	47.3	[33.8–60.7]	22.2	[16.3–29.6]	77.8	[70.4–83.7]	153
Mpumalanga	47.5	[35.2–59.7]	29.5	[23.1–36.7]	70.5	[63.3–76.9]	102
Limpopo	*	*	*	*	*	*	35
Total	65.3	[56.1–74.4]	15.3	[12.6–18.5]	84.7	[81.5–87.4]	1 223
Race							
African	58.3	[50.9–65.7]	16.7	[13.6–20.4]	83.3	[79.6–86.4]	825
White	*	*	*	*	*	*	13
Coloured	110.0	[64.7–155.3]	7.3	[4.7–11.0]	92.7	[89.0–95.3]	341
Asian/Indian	*	*	*	*	*	*	41
Total	65.3	[56.1–74.5]	15.4	[12.7–18.5]	84.6	[81.5–87.3]	1 220

95% CI: 95% confidence interval

** Too few observations to record reliably*

while anaemia due to other causes was more prevalent among residents of informal areas. The province with the highest prevalence of IDA was Gauteng (11.5%). The provinces with the lowest IDA prevalence were North West (2.8%), Eastern Cape (3.0%) and Western Cape (5.7%) – only North West was significantly lower than Gauteng. Anaemia due to other causes was most prevalent in the Eastern Cape (16.6%), with the lowest prevalence in Gauteng (9.6%). There was no significant difference between the provinces in prevalence of anaemia due to other causes. Black African women had a higher prevalence of IDA and anaemia due to other causes than coloured women (this was not significant).

Table 3.6.2.5: Iron status of female participants 16–35 years of age by age, locality, province and race, South Africa 2012

Background characteristic	Females of reproductive age								
	Iron depleted (Hb ≥ 12g/dL and ferritin ≤ 15ug/L)		Iron deficiency anaemia (Hb ≤ 12g/dL and ferritin ≤ 15ug/L)		Iron replete (Hb ≥ 12g/dL and ferritin ≥ 15ug/L)		Anaemia due to other causes (Hb ≤ 12g/dL and ferritin ≥ 15ug/L)		Sample size
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age									
16–25	6.9	[4.6,10.2]	10.5	[7.4,14.6]	72.0	[66.6,76.8]	10.7	[8.1,13.9]	699
26–35	4.4	[2.0,9.5]	8.5	[5.6,12.7]	72.3	[66.4,77.5]	14.8	[11.0,19.7]	468
Total	5.9	[3.9,8.9]	9.7	[7.5,12.4]	72.1	[67.9,75.9]	12.3	[10.1,15.0]	1 167
Locality									
Urban formal	7.0	[3.8,12.6]	9.5	[6.7,13.4]	72.7	[66.0,78.5]	10.8	[7.8,14.7]	553
Urban informal	2.4	[1.1,5.1]	14.7	[8.0,25.4]	67.2	[58.4,75.0]	15.7	[9.9,24.0]	191
Rural formal	6.1	[3.2,11.5]	6.2	[2.8,13.3]	78.4	[70.7,84.5]	9.3	[6.3,13.4]	218
Rural informal	5.4	[3.1,9.1]	8.4	[4.8,14.1]	70.8	[62.6,77.8]	15.5	[10.5,22.3]	205
Total	5.9	[3.9,8.9]	9.7	[7.5,12.4]	72.1	[67.9,75.9]	12.3	[10.1,15.0]	1 167
Province									
Western Cape	2.6	[1.0,6.2]	5.7	[3.2,10.0]	81.5	[75.9,86.0]	10.2	[6.9,14.9]	262
Eastern Cape	0.7	[0.1,5.0]	3.0	[1.0,8.8]	79.6	[72.0,85.6]	16.6	[11.3,23.9]	169
Northern Cape	*	*	*	*	*	*	*	*	81
Free State	2.0	[0.4,9.8]	8.8	[4.1,17.9]	79.5	[70.7,86.2]	9.7	[4.3,20.5]	109
KwaZulu-Natal	*	*	*	*	*	*	*	*	99
North West	2.5	[0.8,7.4]	2.8	[1.2,6.8]	80.4	[71.7,86.9]	14.2	[8.5,22.8]	167
Gauteng	11.2	[5.9,20.1]	11.5	[7.1,18.2]	67.7	[57.1,76.8]	9.6	[5.6,15.9]	148
Mpumalanga	*	*	*	*	*	*	*	*	98
Limpopo	*	*	*	*	*	*	*	*	34
Total	5.9	[3.9,8.9]	9.7	[7.5,12.4]	72.1	[67.9,75.9]	12.3	[10.1,15.0]	1 167
Race									
African	6.7	[4.3,10.2]	10.4	[7.8,13.7]	69.4	[64.6,73.9]	13.5	[10.9,16.6]	788
White	*	*	*	*	*	*	*	*	10
Coloured	1.3	[0.5,3.5]	5.8	[3.6,9.4]	85.7	[81.0,89.3]	7.1	[4.6,10.9]	327
Asian/Indian	*	*	*	*	*	*	*	*	39
Total	5.9	[3.9,8.9]	9.7	[7.5,12.5]	72.0	[67.8,75.8]	12.4	[10.1,15.0]	1 164

95% CI: 95% confidence interval

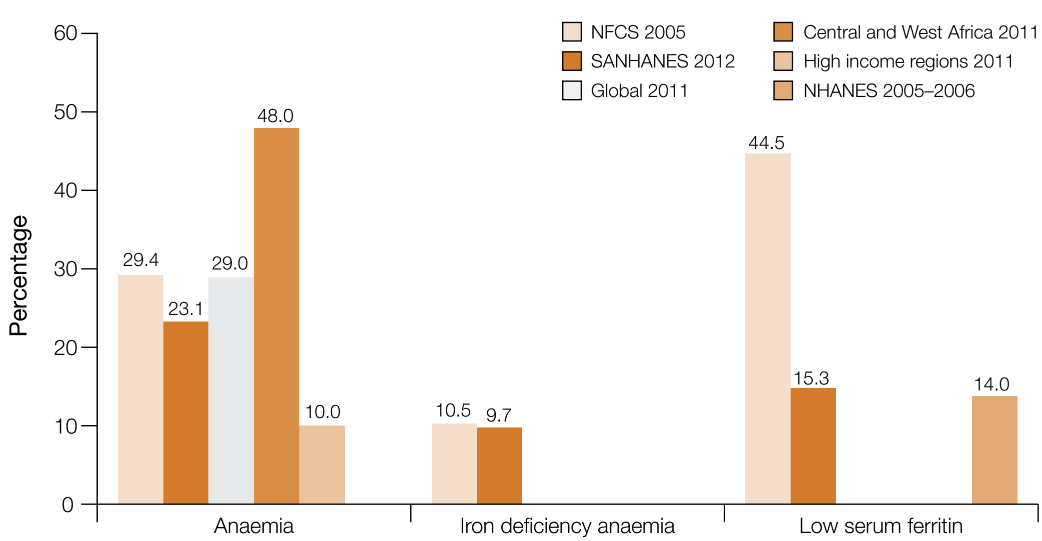
** Too few observations to record reliably*

Discussion

The findings of this survey indicate that, according to the classification by WHO/CDC (De Benoist, McLean, Egli et al. (Eds) 2008), the prevalence of anaemia among South African males is considered a mild public health problem, while for females it is of moderate public health importance at 22.0%. This survey is also the first to provide an estimate on the national anaemia prevalence among males in South Africa. However, the WHO Global Database on Anaemia indicates that 12.7% of men worldwide were anaemic (De Benoist, McLean, Egli et al. (Eds) 2008), while 2.8% of US men were anaemic (McFarlane 2008). For women, the respective percentages were 30.2% and 7.6% for the WHO global database and the US. In India, the national anaemia prevalence was 55.3% for females and 24.2% for males, with the respective percentages for moderate (including severe) anaemia 16.8% and 11.2% (International Institute for Population Sciences and Macro International 2007). The corresponding SANHANES-1 survey results were 22.0% and 12.2%, and 9.6% and 1.7%, for females and males, respectively. Anaemia in women of reproductive age in SANHANES-1 (23.1%) showed a 21.4% decrease compared to NFCS 2005 (Figure 3.7.2.1) (Labadarios 2007), was lower than the regional prevalence (48%), and higher than the prevalence for the high income region of the world (16%) (Stevens 2013). Low serum ferritin (< 15 ug/dL) dropped by 65.6% from the 44.5% prevalence in NFCS 2005 to the current 15.3%. NHANES 2005–2006 prevalence of low ferritin was 14% for women 12–49 years of age (CDC 2012). Further, IDA prevalence decreased slightly compared to NFCS 2005, from 10.5% to 9.7%.

While anaemia prevalence decreased with age in females, it increased with age in males. This is not unexpected since older women would not be menstruating and unlikely to fall pregnant. Anaemia that is associated with ageing and other morbidities would explain the increasing prevalence among older males. Generally, differences in anaemia terms between males and females that are seen in younger adults lessened with ageing. Guralnik et al. (2004) showed that the prevalence of anaemia increases directly with age, having been reported to be 10% (men) to 11% (women) in the group 65 years and older, and increased

Figure 3.6.2.1: Anaemia, iron deficiency anaemia and low serum ferritin among female participants aged 16–35 years



to 26% to 20% in the group 85 years and older. In the SANHANES-1 survey, males and females older than 65 years of age had anaemia prevalences of 25.9% and 17.0%, respectively.

The SANHANES-1 survey has provided a baseline for the prevalence of anaemia among adult males and females for South Africa. The results also indicate that the country has an anaemia prevalence that is in-between that for developing and developed countries. The high prevalence of HIV and of TB against the backdrop of poverty probably plays a role in the current evaluation of anaemia prevalence. A further conundrum is the non-appearance of arguably one of the most impoverished provinces, the Eastern Cape, among the high anaemia prevalence provinces, which might conceivably be related to the known migration patterns in the province (Stats SA 2006). Only by recognising the complexity of anaemia can effective strategies be established and progress be made. Consequently, an integrated – multifactorial and multisectoral – approach is required to combat this public health problem (WHO and UNICEF 2004), particularly in women.

3.6.3 Dietary diversity

A variety of foods in the diet is needed to ensure an adequate intake of essential nutrients. Dietary diversity can be used as a proxy measure of the nutritional quality of a population's diet, as well as an indicator of the access dimension of household food security (Kennedy 2009). Populations consuming a diet of low dietary diversity are nutritionally vulnerable (Kennedy 2009).

In this survey, adult participants were asked to recall all foods and drinks consumed the previous day. These food items were then allocated to specific food groups. A dietary diversity score (DDS) was calculated by summing the number of food groups from which food had been consumed; the nine food groups were cereals, roots and tubers; vitamin A-rich vegetables and fruit; vegetables other than vitamin A is rich; fruit other than vitamin A-rich fruit; meat, poultry, and fish; eggs; legumes; dairy products; and foods made with fats or oils. Each food group was counted only once. A DDS below four is considered to be low and to be associated with dietary inadequacies (Steyn et al. 2006).

Results

The mean DDS across all age categories at the national level was 4.2, which is close to the cut-off level for dietary adequacy (Table 3.6.3.1). The score did not differ significantly across the age categories. Four out of ten participants in the groups 15–24 years of age and 35–44 years of age had the lowest DDS. There were no significant differences between age categories.

Participants in urban formal areas had a significantly higher mean DDS (4.7) and the lowest percentage of participants who consumed a diet of low diversity (29.3%). By contrast, twice as many participants in rural informal areas had a low DDS (59.7%).

Western Cape and Gauteng had the lowest number of participants with DDS < 4 (28.2% and 26.3%, respectively), while North West (61.3%) and Limpopo (65.6%) had the highest number of participants with DDS < 4.

The mean DDS was significantly higher in white participants when compared with other race groups. The black African participants had the lowest dietary score and the highest number of participants with low dietary diversity (44.9%).

Table 3.6.3.1: Dietary diversity score (DDS) among all participants aged 15 years and older by age, locality, province and race, South Africa 2012

Background characteristics	DDS		DDS < 4		Total
	Mean	95% CI	%	95% CI	n
Age					
15–24	4.1	[3.9–4.3]	41.7	[37.9–45.6]	3 702
25–34	4.2	[4.0–4.4]	38.3	[34.6–42.2]	2 644
35–44	4.1	[3.9–4.3]	40.7	[36.3–45.1]	2 215
45–54	4.3	[4.1–4.5]	37.1	[32.8–41.5]	2 038
55–64	4.3	[4.1–4.5]	39.8	[35.2–44.6]	1 514
65+	4.2	[4.0–4.5]	38.8	[33.0–45.1]	1 237
Locality					
Urban formal	4.7	[4.5–4.9]	29.3	[25.8–33.1]	7 467
Urban informal	3.8	[3.5–4.1]	46.6	[40.7–52.6]	1 764
Rural formal	3.6	[3.4–3.9]	50.7	[44.3–57.1]	1 662
Rural informal	3.3	[3.2–3.5]	59.7	[54.6–64.7]	2 464
Province					
Western Cape	4.6	[4.3–4.8]	28.2	[22.5–34.7]	2 038
Eastern Cape	4.0	[3.7–4.2]	42.1	[37.1–47.4]	1 532
Northern Cape	3.8	[3.5–4.1]	43.6	[35.2–52.5]	955
Free State	4.0	[3.7–4.3]	45.1	[37.1–53.4]	711
KwaZulu-Natal	3.7	[3.5–4.0]	49.3	[41.9–56.6]	2 358
North West	3.3	[3.1–3.5]	61.3	[55.3–67.0]	1 709
Gauteng	4.9	[4.6–5.2]	26.3	[21.0–32.2]	2 289
Mpumalanga	4.0	[3.5–4.4]	46.2	[37.3–55.4]	1 249
Limpopo	3.2	[2.8–3.6]	65.6	[52.8–76.5]	516
Race					
African	4.0	[3.8–4.1]	44.9	[41.1–48.8]	8 627
White	5.6	[5.2–6.0]	14.9	[10.2–21.2]	648
Coloured	4.5	[4.2–4.7]	30.0	[26.0–34.4]	2 868
Asian/Indian	4.1	[3.7–4.6]	31.6	[20.8–44.9]	1 167
Total	4.2	[4.1–4.3]	39.7	[36.7–42.7]	13 357

95% CI: 95% confidence interval

Discussion

A diet that is sufficiently diverse reflects nutrient adequacy. This statement is based on the fact that no single food contains all required nutrients for optimal health. Consequently, the more food groups included in a daily diet, the greater the likelihood of meeting nutrient requirements (Kennedy 2009). Monotonous diets, based mainly on starches such as maize, rice and bread, have been closely associated with food insecurity. Dietary diversity is an outcome measure of food security at the individual or household level (Kennedy 2009). Apart from reflecting on food security, a low DDS has also been associated with low weight and stunted growth (Rah, Akhter, Semba et al. 2010), cardiovascular risk (Azadbakht, Miriran, Esmaillzadeh et al. 2006), dyslipidaemia (Li, Wedick, Lai et al. 2011), as well as a risk factor for the metabolic syndrome (Azadbakht, Mirmiran, Azizi et al. 2005). In the present study, the mean dietary score of the population was 4.2% with nearly 40% of the population having a score less than 4.

A previous national survey in 2009 (Labadarios, Steyn & Nel 2011) found the mean DDS to be 4.02 (3.96–4.07) with 38% of the population having a DDS less than 4. DDS in the earlier study was significantly higher in the high LSM category compared with the low LSM category (4.96 compared to 3.05; $p < 0.01$) and was significantly higher in whites (4.96) compared with black Africans (3.63; $p < 0.01$), reflecting the low dietary variety in the black African population. The finding that higher DDS was found in higher LSM categories was also confirmed by the present study, which recorded the highest DDS in Gauteng and Western Cape, the two more economically developed provinces. The earlier survey in 2009 indicated that the lower DDS in black Africans was due to lower intakes of dairy products, animal proteins, and fruits and vegetables. Participants in urban formal areas in this survey had a significantly higher mean DDS (4.7) and the lowest percentage of participants consuming a diet of low diversity (29.3%). By contrast, twice as many participants in rural informal areas had a low dietary diversity (59.7%).

Results from the earlier national survey also showed that environmental factors are important determinants associated with dietary diversity (Labadarios, Steyn & Nel et al. 2011). A river water source was associated with a sevenfold odds ratio of having a DDS < 4 compared with those with a DDS ≥ 4. Other factors that contributed to low DDS, included: having no toilet, living in a traditional type house, and no access to electricity. Health care was also regarded as a contributing factor to low DDS since those who were chronically ill or disabled had twice the odds of having a low DDS. Indeed, the majority of environmental risk factors are the direct outcome of poverty and they appear to be interrelated.

A comparison of the DDS of the present study (national mean DDS = 4.2), was done with three local South African studies. Firstly, a survey in Sekhukune in Limpopo, confirmed the link between food security and dietary diversity (Faber, Schwabe & Drimie 2009). They found a significant inverse correlation between the hunger scale ‘household food insecurity and access scale’ (similar to that used in the present study) and dietary diversity ($p < 0.01$). A second study on the low income elderly in Sharpeville, found a DDS of 3.41 (SD 1.34) (Oldewage-Theron & Kruger 2008).They also determined that having a better DDS resulted in a better mean nutrient adequacy ratio, namely a diet with better nutrient quality. Lastly, a third study in South Africa determined the DDS of infants (6–24 months of age) (Mpontshane, Van den Broeck, Chhagan et al. 2008). They found that low dietary diversity was more common in HIV-infected children than those who were not (OR), 2.59; 95% CI, 1.52 to 4.41).

In terms of studies in other developing countries who have evaluated dietary diversity, a mean DDS of 4.9 was found in Filipino children 24–71 months of age using the same number of food groups as in the present study (Kennedy, Pedro, Seghieri et al. 2009). In Burkino Faso, a score of 4.6 was found; 3.3 in northern Uganda and 5.2 in Laos (Kennedy, Pedro, Seghieri et al. 2009). It appears that poor dietary variety is a feature of many developing countries, and is not restricted to the South African population.

3.6.4 Dietary intake

The increase in the prevalence of chronic diseases in the developing world is largely attributed to changes in lifestyle associated with globalisation and urbanisation (WHO 2003). Risk factors and behaviours associated with chronic NCDs such as unhealthy diet, obesity, hypertension, tobacco use, risky drinking, and sedentary lifestyles are leading causes of morbidity, mortality and impaired functioning (WHO 2003). Unhealthy diet is one of the main causes of overweight and obesity which, in turn, are major risk factors for hypertension and type 2 diabetes.

Studies from populations throughout the world have demonstrated a strong association of obesity with chronic NCDs, especially type 2 diabetes, and cardiovascular diseases (Popkin 2002; Vorster 2002). A high energy intake is one of the main risk factors for obesity in both children and adults. This, together with a high total fat intake, high saturated fat intake, high refined carbohydrate and added sugar intake, low fibre intake and low intake of fruits and vegetables, has been classified as a typical 'western diet' which contributes to the development of chronic diseases, including cardiovascular diseases and diabetes. This process has been described by many as the nutrition transition (Popkin 2002). In view of the reported rising prevalence of NCDs worldwide and South Africa, the inclusion of dietary intake and practices in the country was considered essential in SANHANES-1.

Results

A number of selected dietary intake scores are presented in this subsection.

Dietary fat intake

The fat score used in this study is based on dietary habits of the individual with regard to the use of fat in the diet. A low score is indicative of a dietary pattern that does not include much fat in the diet. A high score refers to a person who is accustomed to eating a lot of fat in the diet, such as fatty meat, many fried foods and high fat snack foods. A high fat score ranges from 15–20, a moderate score from 8–14 and a low score from 0–7.

At the national level, the mean fat score was 7.26 (7.37 in males and 7.15 in females), with nearly one out of five participants (18%) having a high fat score (Table 3.6.4.1). The mean fat score decreased progressively and overall significantly with age from 7.94 in the youngest age group to 5.49 in the group 65 years and older, a pattern that was similar in the percentage of participants who had a high fat intake (fat score 11–20). The two youngest age groups had significantly higher mean intakes than those of the older groups.

The mean fat score ranged from 5.57 in rural informal areas to 8.32 in urban formal areas. Half of the participants in the rural areas were low fat consumers (54.2%–54.4%), with only a quarter of those living in urban formal areas having a low fat score (23.6%). High fat users predominated in the urban formal areas (23.1%), the opposite being the case in rural formal areas (9.8%). High fat intake was significantly higher in the urban formal areas (23.1%) compared to the other areas (range 9.8%–15.1%).

At the provincial level, the mean fat score ranged from 5.06 in the Eastern Cape to 9.19 in Gauteng. The highest rates of low fat users were in Eastern Cape (57.8%), Limpopo (55.3%), and North West (48.9%), with Gauteng having the lowest rate of low fat consumers (16.0%). The reverse was the case for high fat users. The mean fat score for Gauteng was significantly higher than that of all other provinces, while the mean scores for Eastern Cape and Limpopo were significantly lower than those of all other provinces.

Table 3.6.4.1: Fat intake scores among all participants aged 15 years and older based on a food frequency questionnaire by sex, age, locality, province and race, South Africa 2012

Fat score									
Background characteristics			Low (0–5)		Moderate (6–10)		High (11–20)		Total
	Mean	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex									
Males	7.37	[7.05–7.70]	34.1	[31.0–37.4]	47.1	[44.1–50.2]	18.7	[16.2–21.6]	6 336
Females	7.15	[6.84–7.47]	36.3	[33.4–39.4]	45.7	[43.2–48.2]	18.0	[15.4–20.8]	8 990
Age									
15–24	7.94	[7.55–8.34]	28.9	[25.5–32.6]	46.8	[43.4–50.1]	24.3	[20.4–28.8]	4 330
25–34	7.69	[7.33–8.06]	30.5	[26.9–34.3]	49.6	[46.3–52.9]	19.9	[17.0–23.2]	3 018
35–44	7.16	[6.80–7.52]	35.5	[32.0–39.1]	48.0	[44.3–51.6]	16.5	[13.8–19.7]	2 516
45–54	6.94	[6.55–7.32]	38.5	[34.7–42.3]	46.8	[43.4–50.3]	14.7	[12.3–17.5]	2 292
55–64	6.05	[5.68–6.41]	47.1	[42.9–51.4]	40.9	[37.3–44.7]	11.9	[9.2–15.4]	1 748
65+	5.49	[5.03–5.94]	55.0	[49.5–60.4]	35.7	[30.9–40.9]	9.3	[6.3–13.4]	1 417
Locality									
Urban formal	8.32	[7.94–8.70]	23.6	[20.4–27.0]	53.3	[49.6–57.0]	23.1	[19.4–27.3]	8 291
Urban informal	6.66	[6.28–7.04]	40.1	[35.7–44.8]	44.8	[40.6–49.0]	15.1	[11.9–19.0]	1 913
Rural formal	5.58	[4.97–6.19]	54.2	[47.1–61.1]	36.0	[29.7–42.8]	9.8	[6.4–14.7]	1 865
Rural informal	5.57	[5.16–5.98]	54.4	[50.2–58.5]	34.3	[31.3–37.5]	11.3	[8.8–14.3]	3 263
Province									
Western Cape	6.78	[6.40–7.16]	38.1	[33.5–42.9]	50.9	[46.3–55.4]	11.0	[7.6–15.8]	2 150
Eastern Cape	5.06	[4.46–5.65]	57.8	[50.7–64.6]	35.2	[30.1–40.6]	7.0	[4.7–10.4]	1 638
Northern Cape	6.25	[5.56–6.94]	40.7	[32.3–49.8]	50.9	[44.0–57.7]	8.4	[5.2–13.4]	992
Free State	7.28	[6.76–7.80]	31.0	[23.6–39.5]	51.7	[45.1–58.3]	17.3	[13.8–21.5]	831
KwaZulu-Natal	6.91	[6.46–7.37]	39.1	[34.9–43.4]	45.3	[41.5–49.2]	15.6	[11.8–20.3]	2 543
North West	6.24	[5.55–6.92]	48.9	[42.8–55.1]	33.6	[28.2–39.4]	17.5	[12.6–23.7]	1 930
Gauteng	9.19	[8.63–9.76]	16.0	[12.3–20.7]	54.5	[48.3–60.5]	29.5	[23.6–36.1]	2 640
Mpumalanga	7.55	[6.65–8.45]	34.0	[24.6–44.9]	45.3	[36.9–54.0]	20.7	[15.1–27.6]	1 343
Limpopo	5.20	[4.73–5.68]	55.3	[48.8–61.7]	36.8	[32.0–41.8]	7.9	[5.5–11.1]	1 265
Race									
African	7.09	[6.72–7.46]	36.8	[33.1–40.6]	44.7	[41.7–47.8]	18.5	[15.7–21.7]	10 196
White	8.54	[7.44–9.65]	27.1	[20.7–34.7]	49.1	[42.0–56.3]	23.7	[16.1–33.5]	720
Coloured	7.17	[6.83–7.52]	32.7	[28.5–37.2]	55.0	[50.7–59.3]	12.3	[9.7–15.4]	3 048
Asian/Indian	7.09	[6.67–7.52]	33.7	[27.1–40.8]	54.7	[46.9–62.2]	11.7	[8.5–15.8]	1 316
Total	7.26	[6.95–7.56]	35.3	[32.4–38.3]	46.4	[43.8–48.9]	18.3	[15.9–21.1]	15 332

95% CI: 95% confidence interval

The mean fat score was highest in whites (8.54), being significantly higher than that of black Africans (7.09) and Indians (7.09). The highest percentage of low fat users were black Africans (36.8%) with only one out of three participants in the white group having a low (27.1%) and one out of four having a high (23.7%) fat consumption.

Dietary sugar intake

A high sugar intake is associated with the development of chronic conditions such as dental caries, obesity and diabetes (Steyn & Temple 2012). It is also a contributory factor to the nutrition transition, whereby urbanisation results in the consumption of an increased intake of sugar, fat, saturated fat, and salt in the diet (Popkin 2002).

The sugar score used in the present study is based on the dietary habits of the individual with regard to the use of sugar in the diet. A low score is indicative of a pattern that does not include much sugar in the diet. A high score refers to a person who is accustomed to a high sugar intake in the form of, for example, sweetened beverages, confectionary and sweet snacks. A high score in the current study was regarded as a score of 6–8, moderate was 3–5, and low 0–2.

The overall mean sugar score was 3.0 and ranged from 2.95 in males to 3.05 in females (Table 3.6.4.2). The mean sugar score ranged from 3.47 in the youngest age group, decreasing gradually to the lowest mean of 2.22 in the group 65 years of age and older. The largest percentage of participants with a low sugar score was in the group 65 years of age and older (59.4%) and the lowest in the group 15–24 years of age (32.5%). The highest rate of a high sugar score was in the group 15–24 years of age (27.0%) and the lowest in the group 65 years of age and older (10.7%). The two youngest age groups had significantly higher mean sugar scores compared with the older age groups.

The mean sugar score ranged from 2.26 in rural formal areas to 3.36 in urban formal areas. The urban formal areas had a significantly higher mean score than that of the other areas. The highest rate of low sugar consumers was in the rural formal areas (58.4%) and the lowest in urban formal areas (33.8%). The highest percentage of high sugar users was in the urban formal areas (23.1%) and the lowest in rural formal areas (11.7%). The mean sugar score ranged from 2.14 in Eastern Cape to 3.03 in Western Cape. KwaZulu-Natal, Limpopo, North West and Eastern Cape had significantly lower mean scores compared with Western Cape and Gauteng. The highest percentage of low sugar users were in Eastern Cape (60.4%), while the lowest was in Gauteng (29.4%). The highest percentage of high sugar users was in Gauteng (28.0%) and the lowest in Eastern Cape (7.7%).

The mean sugar score ranged from 2.91 in black Africans to 3.44 in whites. The highest percentage of low sugar users were black Africans (44.7%) and the lowest were whites (31.7%). The highest rate of high sugar users were whites (21.1%) and the lowest Indians (16.1%).

Dietary intake of fruit and vegetables

The World Health Organization (WHO 2003) recommends an intake of five portions (400 g) of fruit and vegetables per day as being protective against NCDs including cancer of the oral cavity, oesophagus, stomach and colorectum. Fruit and vegetables consumption is also believed to be a protective factor against developing obesity, type 2 diabetes and cardiovascular diseases (WHO 2003). In this study, a score to measure fruit and vegetables intake per day was developed based on the reported daily intake of fruit and vegetables in the survey's participants. A high score for fruit and vegetables daily consumption would be 6–8, moderate 3–5 and a poor score would be 0–2.

Table 3.6.4.2: Sugar intake scores among all participants aged 15 years and older based on a food frequency questionnaire by sex, age, locality, province and race, South Africa 2012

Sugar score									
Background characteristics			Low (0–2)		Moderate (3–4)		High (5–8)		Total
	Mean	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex									
Males	2.95	[2.82–3.09]	43.5	[40.5–46.4]	37.2	[34.9–39.6]	19.3	[17.0–21.9]	6 332
Females	3.05	[2.92–3.17]	40.9	[38.4–43.6]	39.1	[37.0–41.3]	20.0	[17.6–22.6]	8 976
Age group									
15–24	3.47	[3.31–3.63]	32.5	[29.5–35.7]	40.6	[38.2–43.0]	27.0	[23.7–30.5]	4 325
25–34	3.15	[2.99–3.31]	38.4	[35.0–42.0]	40.9	[37.7–44.2]	20.7	[17.7–24.1]	3 012
35–44	2.87	[2.71–3.04]	44.7	[41.0–48.5]	38.0	[34.6–41.6]	17.3	[14.5–20.4]	2 514
45–54	2.74	[2.57–2.91]	47.9	[44.0–51.8]	36.5	[33.1–40.0]	15.7	[12.8–19.0]	2 291
55–64	2.47	[2.32–2.63]	54.1	[50.1–58.1]	33.5	[29.7–37.4]	12.4	[9.8–15.5]	1 746
65+	2.22	[2.03–2.41]	59.4	[54.5–64.2]	29.8	[25.6–34.4]	10.7	[7.8–14.6]	1 415
Locality									
Urban formal	3.36	[3.20–3.53]	33.8	[30.6–37.2]	43.1	[40.3–45.9]	23.1	[19.8–26.9]	8 276
Urban informal	2.78	[2.59–2.98]	48.3	[44.1–52.6]	33.5	[30.7–36.4]	18.2	[14.5–22.6]	1 911
Rural formal	2.26	[1.96–2.56]	58.4	[51.9–64.6]	29.9	[25.4–34.9]	11.7	[8.9–15.3]	1 865
Rural informal	2.50	[2.33–2.66]	53.7	[50.0–57.4]	31.5	[29.1–34.1]	14.7	[12.3–17.6]	3 262
Province									
Western Cape	3.03	[2.86–3.19]	41.0	[36.9–45.2]	43.1	[39.2–47.1]	15.9	[12.6–19.8]	2 147
Eastern Cape	2.14	[1.89–2.39]	60.4	[54.3–66.1]	32.0	[28.0–36.3]	7.7	[5.4–10.7]	1 637
Northern Cape	2.97	[2.68–3.26]	40.0	[33.2–47.2]	42.9	[35.5–50.5]	17.2	[12.7–22.7]	991
Free State	2.88	[2.63–3.13]	44.0	[37.5–50.7]	39.2	[33.7–44.9]	16.8	[13.1–21.5]	829
KwaZulu-Natal	3.03	[2.83–3.23]	40.8	[35.9–45.9]	40.2	[36.1–44.4]	19.0	[15.7–22.9]	2 537
North West	2.56	[2.28–2.84]	56.5	[50.8–62.0]	25.5	[21.3–30.3]	18.0	[13.6–23.3]	1 928
Gauteng	3.59	[3.32–3.86]	29.4	[24.8–34.5]	42.7	[38.4–47.0]	28.0	[22.5–34.2]	2 637
Mpumalanga	3.02	[2.64–3.40]	42.0	[34.1–50.3]	37.2	[30.2–44.8]	20.8	[16.0–26.6]	1 343
Limpopo	2.40	[2.20–2.60]	54.2	[49.3–59.0]	32.6	[28.9–36.6]	13.2	[10.3–16.7]	1 265
Race									
African	2.91	[2.77–3.06]	44.7	[41.6–47.8]	35.5	[33.2–37.7]	19.9	[17.3–22.7]	10 185
White	3.44	[3.00–3.88]	31.7	[25.3–39.0]	47.2	[41.7–52.7]	21.1	[14.1–30.2]	718
Coloured	3.19	[3.04–3.35]	34.8	[30.6–39.2]	48.1	[43.8–52.4]	17.1	[14.5–20.2]	3 045
Asian/Indian	3.22	[3.04–3.40]	33.9	[27.5–40.8]	50.1	[43.7–56.4]	16.1	[12.3–20.8]	1 314
Other	2.73	[2.01–3.44]	52.3	[34.6–69.4]	31.8	[16.1–53.2]	15.9	[6.1–35.5]	44
Total	3.00	[2.88–3.12]	42.1	[39.7–44.6]	38.2	[36.4–40.1]	19.7	[17.5–22.1]	15 314

95% CI: 95% confidence interval

Results

The mean score for the survey's population was 3.77 in males and in females (Table 3.6.4.3). One quarter of the participants (25.6%) had a low score and 29% had a high score. The mean score was similar across different age groups, as were the rates of scores within the different categories. There were no significant differences in mean scores by sex or age.

The highest mean score of fruit and vegetable consumption was found in urban formal areas (4.13) and differed significantly from the lowest (3.31–3.38) in the other localities. The highest number of participants having a low fruit and vegetables score were those in rural formal areas (36.7%) and the lowest in the urban formal areas (18.8%). The highest scorers in the high score of consumption category were in urban formal areas (34.5%) and the lowest in rural informal areas (20.9%). The mean fruit and vegetable score ranged from 3.07 in Northern Cape to 4.44 in Gauteng. The mean score for Eastern Cape was significantly lower than that of Western Cape and Gauteng. The highest percentage of low fruit and vegetables scorers were in Eastern Cape (38.2%) and the lowest in Gauteng (15.4%). The highest percentage of high fruit and vegetables scorers were in Gauteng (40.6%) and the lowest in Northern Cape (15.1%) and Eastern Cape (17.5%).

Mean fruit and vegetable scores ranged from 3.63 in black Africans to 4.75 in whites. The highest rate of low fruit and vegetable scorers were black African males (28.3%) and the lowest were whites (10.7%). The highest percentage of high fruit and vegetable scorers were whites (46.5%) and the lowest were coloureds (24.8%).

With regard to the daily consumption of fruits alone (data not shown), 4.6% of adults consumed four or more fruits per day while the majority of participants (52.2%) consumed one to three fruits per day. Patterns such consumption were similar countrywide and there were no significant differences by sex, locality, or province. However, by race, a significantly higher rate of whites (9.0%) had four or more fruits per day than black African consumers (3.9%).

Discussion

The distribution of the fat and sugar scores in both males and females in this survey reflects the classic picture of the nutrition transition and urbanisation (Vorster 2002). The highest fat and sugar scores were found in the youngest age groups, in formal urban areas in those provinces that were largely urbanised, such as Gauteng. The lowest fat and sugar scores were found in the older age groups in rural areas in those provinces where the least urbanisation has taken place: Eastern Cape, North West and Limpopo. The consistent finding that the older age group ate less is a disadvantage in terms of fruit and vegetable consumption, but an advantage from a sugar and fat perspective, when taking the development of NCDs into consideration. Ideally, one would promote a liberal consumption of fruit and vegetables and a low consumption of fat and added sugar in older South Africans.

Earlier national data on adult women in South Africa (Steyn & Nel 2006) showed that urban women had a total fat and saturated fat intake of 29.1% and 8.6% of energy intake, respectively, while rural women had an intake of 15.6% and 4.0%, respectively; a large and significant difference between urban and rural women ($p < 0.01$). While fat intake *per se* was not measured in this study, the large urban and rural differences in fat intake scores have been confirmed at national level in this survey. A household study in the

Table 3.6.4.3: Fruit and vegetable intake scores among all participants aged 15 years and older based on a food frequency questionnaire by sex, age, locality, province and race, South Africa 2012

Fruit and vegetable score category									
Background characteristics			Low (0–2)		Moderate (3–4)		High (5–8)		Total
	Mean	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex									
Male	3.77	[3.61–3.93]	25.6	[23.2–28.2]	45.4	[42.6–48.3]	28.9	[25.8–32.3]	6 327
Female	3.77	[3.65–3.88]	25.5	[23.2–28.1]	45.1	[42.6–47.7]	29.3	[27.0–31.7]	8 964
Age									
15–24	3.68	[3.53–3.84]	27.4	[24.4–30.6]	44.8	[41.9–47.7]	27.8	[24.6–31.2]	4 322
25–34	3.78	[3.61–3.95]	24.7	[21.8–27.9]	46.6	[43.4–49.9]	28.7	[25.4–32.2]	3 011
35–44	3.82	[3.63–4.00]	25.4	[22.5–28.4]	44.6	[40.9–48.4]	30.0	[26.1–34.2]	2 511
45–54	3.89	[3.71–4.08]	24.6	[21.1–28.5]	43.7	[39.7–47.6]	31.7	[27.8–35.9]	2 287
55–64	3.78	[3.63–3.93]	24.0	[20.7–27.7]	48.0	[42.8–53.4]	27.9	[23.9–32.3]	1 743
65+	3.68	[3.47–3.89]	25.7	[21.9–29.9]	44.1	[39.2–49.1]	30.2	[25.2–35.8]	1 412
Locality									
Urban formal	4.13	[3.94–4.32]	18.8	[16.0–22.0]	46.6	[42.9–50.4]	34.5	[30.7–38.6]	8 267
Urban informal	3.38	[3.18–3.59]	32.8	[28.3–37.6]	45.0	[40.0–50.0]	22.2	[18.0–27.2]	1 908
Rural formal	3.31	[3.03–3.58]	36.7	[30.9–42.9]	38.8	[33.0–45.0]	24.5	[19.4–30.3]	1 863
Rural informal	3.23	[3.07–3.38]	34.8	[31.5–38.3]	44.4	[41.6–47.2]	20.9	[18.0–24.0]	3 259
Province									
Western Cape	3.60	[3.35–3.86]	23.5	[18.0–30.0]	52.1	[47.3–56.9]	24.4	[19.3–30.4]	2 148
Eastern Cape	3.08	[2.84–3.32]	38.2	[32.5–44.3]	44.3	[39.5–49.2]	17.5	[14.1–21.4]	1 636
Northern Cape	3.07	[2.77–3.36]	34.9	[28.2–42.2]	49.9	[42.4–57.4]	15.1	[10.7–20.9]	991
Free State	3.35	[3.02–3.69]	35.3	[27.9–43.5]	41.9	[36.5–47.5]	22.8	[17.2–29.6]	829
KwaZulu-Natal	3.52	[3.29–3.75]	29.0	[24.7–33.7]	48.2	[44.3–52.1]	22.9	[18.2–28.3]	2 534
North West	3.61	[3.33–3.88]	31.3	[25.7–37.5]	38.5	[32.5–45.0]	30.2	[25.0–36.0]	1 923
Gauteng	4.44	[4.15–4.73]	15.4	[11.6–20.2]	44.0	[37.9–50.3]	40.6	[34.6–46.9]	2 632
Mpumalanga	3.77	[3.42–4.13]	26.9	[19.7–35.5]	42.4	[37.0–47.9]	30.7	[24.0–38.4]	1 340
Limpopo	3.35	[3.15–3.55]	29.7	[25.7–34.0]	47.4	[43.6–51.3]	22.9	[19.2–27.1]	1 264
Race									
African	3.63	[3.48–3.78]	28.3	[25.6–31.2]	44.6	[42.0–47.3]	27.1	[24.4–30.0]	10 169
White	4.75	[4.30–5.20]	10.7	[6.1–18.1]	42.8	[33.5–52.8]	46.5	[36.2–57.1]	717
Coloured	3.70	[3.52–3.88]	22.3	[19.2–25.7]	52.9	[48.7–57.1]	24.8	[20.3–29.9]	3 046
Asian/Indian	4.07	[3.82–4.32]	17.5	[11.7–25.4]	49.6	[42.1–57.1]	32.9	[27.8–38.3]	1 313
Total	3.77	[3.64–3.90]	25.6	[23.4–27.9]	45.3	[42.9–47.7]	29.1	[26.6–31.8]	15 297

95% CI: 95% confidence interval

United Kingdom found dietary fat intakes of adults to be 35% of energy intake (Ransley, Donnelly, Khara et al. 2001), while in the USA fat intakes of adults from NHANES 2005–6 were lower at 33.7% of energy intake (Austin, Ogden & Hill 2011); some 4% to 5% higher than that of urban adults in South Africa, and higher than the maximum of 30% recommended by WHO (WHO 2003). In terms of sugar intake, this survey has also confirmed the previously reported (Steyn & Nel 2006) large urban and rural differences, with ranges in energy intake between 10% and 6%, respectively. When examining international studies, it should be noted that children under 16 years of age in Scotland were found to have a mean sugar intake of 17.4% energy intake (Sheehy, McNeill, Masson et al.,2008) while NHANES 2005–2010 data from the USA indicated that sugar intake was 14.1% of energy intake in males and 14.5% in females. Both the latter exceeding the 10% of energy intake recommended by WHO (WHO 2003).

The Department of Health has tried to address the issues around the nutrition transition by promoting the food-based dietary guidelines. These have two important guidelines that refer to both fat and sugar intake: Eat fats sparingly and use food and drinks containing sugar sparingly and not between meals. While these two guidelines are aimed at the prevention of NCDs their messages may not be reaching the public at large and this situation needs to be evaluated by the Department of Health.

Another important aspect in the nutrition transition is that poor people have been reported to buy the least expensive foods that are gastronomically the most filling; the so-called energy-dense foods (Basiotis & Lino 2002). As income available to buy food decreases, energy density correspondingly increases and this may translate into higher energy intakes and overconsumption (Temple & Steyn 2009). Energy-dense foods typically contain high quantities of fat, sugar and/or starch such as fast foods, snacks and desserts; as opposed to low-energy dense foods, which are higher in fibre and micronutrients, such as fruit and vegetables.

The intake of fruit and vegetables by South Africans is around 200 g per person per day (Nel & Steyn 2002), which is roughly half of the recommendation made by the WHO of 400 g per day (WHO 2003). Lack of fruit and vegetables may have adverse nutritional consequences with resulting micronutrient deficiencies such as vitamins A and C, folate and potassium, as well as a suboptimal intake of dietary fibre. All of these nutrients are required for optimal health and the prevention of NCDs (WHO 2003). The low intake of fruit and vegetables can be attributed to many factors including poor household food security resulting from poverty. This may be due to both lack of access and the availability of fruit and vegetables in poorer communities such as informal settlements.

With regard to fruit and vegetable consumption, a clear pattern emerged in the present study. People in formal urban areas appeared to consume the most fruit and vegetables as indicated by their fruit and vegetable scores, while in rural areas this consumption was lowest. This may be linked to cost and availability. An earlier study in North West also found that people in urban areas consumed more fruit and vegetables (Vorster, Venter, Wissing et al. 2005). People in rural areas probably have less access to markets and shops selling fresh fruit and vegetables. This means that the health of rural dwellers may be adversely affected in terms of the nutritional value and benefits bestowed by regular fruit and vegetable consumption. A national study in adult women (Steyn & Nel 2006) found that mean levels of three vitamins (folate, vitamin A and vitamin C), closely associated with good intake of fruit and vegetables, were lower than the recommended intakes (Dietary Reference Intakes in NICUS 2003) indicating that fruit and vegetable consumption was not optimal.

According to the Health Survey of England, 28% women and 24% men consumed four or more portions fruit and vegetables per day with the mean intake being 3.7 portions for women and 3.4 portions in men (Official Documents Archive 2005). The latter being similar to the mean of 3.7 found in the present study. In the USA, poor intake of fruit and vegetables appears to be common with only 0.9% of adolescents, 2.2% males and 3.5% of females evaluated in NHANES 2003–4 meeting the recommended requirements (Kimmons, Gillespie, Seymour et al. 2009). In South Africa this was 4.6% in the present study.

The Department of Health advocates a plentiful intake of fruit and vegetables by virtue of the food-based dietary guideline: 'Eat plenty of vegetables and fruit every day.' However, the realisation of this goal appears to be problematic. Perhaps stronger emphasis should be placed on teaching people to make their own vegetable gardens and planting fruit trees.

3.6.5 Dietary knowledge and beliefs

South Africa is a typical of countries that are in their final stage of nutrition transition judging from its relatively moderate levels of underweight in children and men, low levels of underweight in women, high levels of obesity/overweight in women, and as well as high intakes of energy-dense foods and beverages (Abrahams, Mchiza & Steyn 2011). The country also displays the classic signs of a population that is well established in nutrition-related NCDs. Health knowledge is one of the important factors in the prevention and treatment of these nutrition-related NCDs and was included in SANHANES-1 to establish dietary knowledge, behaviour as well as practices that can serve as a point of reference in the future.

3.6.5.1 General nutrition knowledge

Among other considerations, health promotion provides information that can improve the population's knowledge that has the potential to change people's beliefs and behaviours in relation to diet and physical activity. Nutrition knowledge and food intake practices play an important role in the prevention and effective management of NCDs. Factors that influence levels of knowledge vary according to socio-economic characteristics, as well as availability and exposure to education interventions. Although nutrition knowledge, alone, may not be adequate as a determinant of maintaining a healthy diet (O'Brien & Davies 2007), knowledge can positively influence beliefs and facilitate healthier food intake practices.

A score on general nutrition knowledge was developed using nine questions. Four questions on fibre content, three questions on fat content, one question on sugar and one question on fruit. A score of 0–3 correct answers out of 9 was considered to be low, 4–6 was seen to be medium and 7–9 was seen as a high level of knowledge.

Results

Overall, South African adults had a medium (5.26) general mean nutrition knowledge score out of a total of 10 points with no statistical difference by sex. Only one in five participants (22.6%) achieved a high score, the majority (62.9.2%) achieved a medium score and 14.5% achieved low scores (Table 3.6.5.1). The nutrition knowledge tended to increase with age and peaked at the group 55–64 years of age. The nutrition knowledge mean score was significantly higher in urban formal (5.43) compared with urban informal (5.05) and rural informal (4.97) settings. The urban formal areas had a significantly higher knowledge percentage (26.7%) than urban informal (17.6%) and rural informal (16.1%) settings. The Western Cape had a significantly higher (5.78) mean score compared to other provinces. Nearly 40% participants (35.7%) in the Western Cape achieved high scores. The

Table 3.6.5.1: Mean general nutrition knowledge score among all participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	Nutrition knowledge score*		Low (0–3)		Medium (4–6)		High (7–9)		Total
	Mean	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex									
Male	5.21	[5.13–5.30]	14.9	[13.2–16.8]	63.4	[60.6–66.0]	21.7	[19.7–23.9]	6 067
Female	5.31	[5.22–5.39]	14.0	[12.5–15.7]	62.5	[60.2–64.7]	23.5	[21.5–25.6]	8 666
Age									
15–24	5.15	[5.05–5.26]	15.8	[13.7–18.1]	64.2	[61.2–67.0]	20.1	[17.7–22.6]	3 835
25–34	5.24	[5.13–5.36]	14.8	[12.6–17.4]	62.9	[59.8–66.0]	22.2	[19.9–24.7]	2 992
35–44	5.32	[5.23–5.42]	13.2	[11.2–15.5]	63.5	[60.0–66.9]	23.3	[20.6–26.2]	2 495
45–54	5.35	[5.22–5.47]	13.6	[11.7–15.7]	61.9	[58.2–65.5]	24.5	[21.5–27.9]	2 276
55–64	5.36	[5.22–5.51]	14.1	[11.8–16.6]	59.3	[55.5–62.9]	26.7	[22.7–31.1]	1 734
65+	5.28	[5.12–5.44]	14.0	[11.5–16.9]	63.2	[59.0–67.1]	22.9	[19.1–27.2]	1 396
Locality									
Urban formal	5.43	[5.31–5.55]	13.0	[10.9–15.3]	60.4	[56.8–63.8]	26.7	[23.8–29.7]	8 012
Urban informal	5.05	[4.87–5.22]	17.1	[13.4–21.5]	65.3	[60.7–69.6]	17.6	[14.6–21.1]	1 824
Rural formal	5.23	[5.01–5.45]	12.4	[9.3–16.2]	67.8	[63.3–71.9]	19.9	[15.7–24.8]	1 801
Rural informal	4.97	[4.86–5.08]	17.6	[15.4–19.9]	66.4	[64.2–68.4]	16.1	[14.0–18.4]	3 100
Province									
Western Cape	5.78	[5.60–5.96]	9.3	[7.3–11.9]	54.9	[50.4–59.4]	35.7	[30.8–41.0]	2 077
Eastern Cape	5.15	[4.99–5.31]	13.5	[10.6–16.9]	69.5	[65.0–73.7]	17.0	[13.5–21.2]	1 569
Northern Cape	4.83	[4.46–5.19]	22.6	[15.8–31.2]	60.3	[53.6–66.7]	17.1	[12.3–23.3]	956
Free State	5.60	[5.31–5.88]	8.9	[5.1–15.3]	61.7	[55.8–67.2]	29.4	[23.8–35.6]	800
KwaZulu-Natal	5.14	[4.94–5.33]	15.2	[12.0–19.1]	66.0	[62.7–69.1]	18.8	[15.6–22.5]	2 435
North West	4.65	[4.44–4.85]	24.7	[19.8–30.2]	66.1	[60.8–71.0]	9.3	[6.2–13.6]	1 862
Gauteng	5.39	[5.23–5.56]	13.5	[10.4–17.2]	60.4	[54.6–65.9]	26.2	[22.1–30.7]	2 543
Mpumalanga	5.23	[4.97–5.49]	13.9	[10.9–17.5]	64.9	[59.3–70.1]	21.2	[15.5–28.3]	1 295
Limpopo	5.06	[4.90–5.21]	15.8	[13.3–18.8]	65.4	[61.8–68.8]	18.8	[15.0–23.2]	1 200
Race									
African	5.14	[5.05–5.23]	15.4	[13.7–17.3]	65.4	[63.0–67.7]	19.2	[17.3–21.2]	9 773
White	5.82	[5.56–6.07]	11.2	[7.4–16.6]	48.7	[42.0–55.4]	40.1	[33.9–46.6]	696
Coloured	5.54	[5.39–5.68]	11.7	[9.8–13.9]	59.1	[55.2–62.9]	29.2	[25.2–33.6]	2 943
Asian/Indian	5.67	[5.33–6.02]	9.0	[4.6–16.7]	61.7	[56.1–67.0]	29.4	[24.6–34.6]	1 273
Total	5.26	[5.19–5.34]	14.5	[13.0–16.0]	62.9	[60.8–65.0]	22.6	[20.9–24.5]	14 737

** Knowledge score is based on four categories including fruit, sugar, fat and fibre.*

95% CI: 95% confidence interval

lowest mean score was observed in North West (4.65%). Nearly a quarter of participants (24.7%) in North West had significantly lower nutrition knowledge scores. Black Africans had overall a significantly lower mean score (5.14) compared with all other race groups.

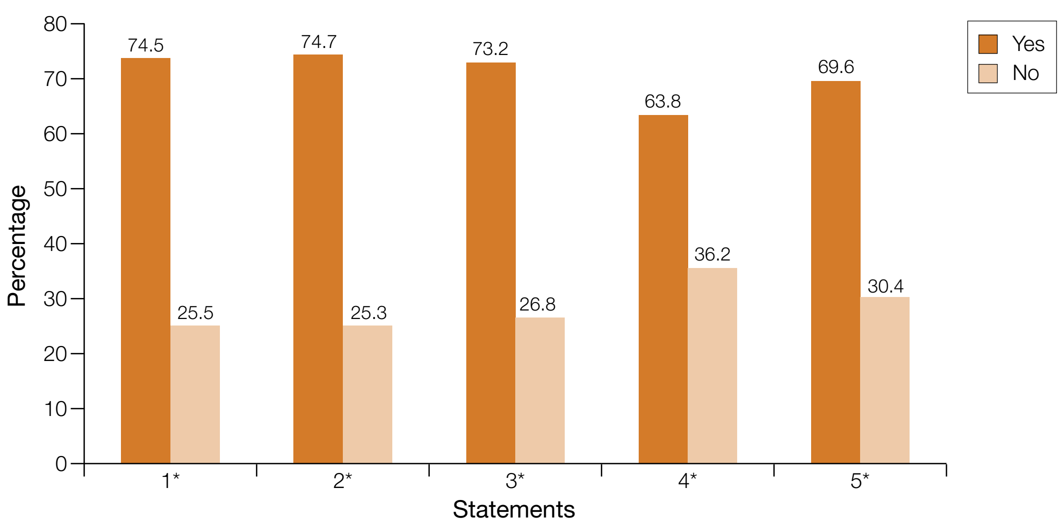
3.6.5.2 Beliefs regarding developing obesity

Nutrition knowledge is also influenced by cultural norms and beliefs regarding obesity (Puoane & Tsolekile 2008). These beliefs in turn are driven by socio-economic status. The problem is affecting adults and children alike, and is prevalent among both privileged and under-privileged communities. This survey assessed nutrition beliefs regarding developing obesity in persons 15 years of age and older.

Results

Overall, the majority of South African adults (74.7%) believed that what you eat can make a difference in your chance of becoming fat (Table 3.6.5.2; Figure 3.6.5.2). They were followed by 74.5% of participants who believed that 'starchy food such as bread, potatoes and rice make people fat'; 73.2% who believed 'what you eat can make a difference in your chance of becoming fat and getting diseases such as heart disease or cancer'; 69.6% who believed 'how much you eat and drink can make a difference in your chance of becoming fat', and 63.8% who believed 'the things I eat and drink now are healthy, so there is no need for me to make changes'. Three-quarters of the participants, therefore, believed that dietary habits influence body weight with only a quarter disagreeing. Despite a few significant differences by gender, age, locality and race group rates present, there were no major disparities in the pattern of findings that emerged. The rates remained above 50% in all analysed strata.

Figure 3.6.5.2: Nutrition beliefs regarding developing obesity among participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012



Statements
1* Starchy food such as bread, potatoes and rice make people fat. (n = 15 181)
2* What you eat can make a difference in your chance of becoming fat. (n = 15 131)
3* What you eat can make a difference in your chance of becoming fat and getting diseases such as heart disease or cancer. (n = 15 131)
4* The things I eat and drink now are healthy, so there is no need for me to make changes. (n = 15 145)
5* How much you eat and drink can make a difference in your chance of becoming fat. (n = 14 965)

Table 3.6.5.2: Nutrition beliefs regarding developing obesity among participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

Nutrition beliefs															
Background characteristics	1*			2*			3*			4*			5*		
	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n
Sex															
Males	73.1	[70.2–75.9]	6 282	73.9	[71.1–76.5]	6 260	72.5	[69.5–75.2]	6 263	65.8	[63.2–68.2]	6 270	68.8	[65.7–71.6]	6 205
Females	75.7	[73.4–77.9]	8 894	75.4	[73.0–77.7]	8 866	73.9	[71.4–76.3]	8 863	62.1	[59.4–64.7]	8 870	70.4	[67.8–72.9]	8 755
Age															
15–24	72.2	[69.1–75.1]	4 295	72.9	[69.6–75.9]	4 279	70.1	[66.5–73.5]	4 283	62.9	[60.1–65.6]	4 282	67.6	[64.1–70.9]	4 227
25–34	74.7	[71.3–77.9]	2 991	75.1	[71.8–78.0]	2 979	72.5	[69.4–75.5]	2 980	63.0	[59.1–66.7]	2 985	69.2	[65.8–72.3]	2 952
35–44	74.6	[71.4–77.6]	2 491	74.5	[71.1–77.6]	2 482	73.0	[69.2–76.4]	2 481	63.8	[60.1–67.3]	2 486	69.9	[66.3–73.2]	2 458
45–54	77.6	[74.3–80.6]	2 273	75.7	[72.0–79.1]	2 265	76.7	[73.1–80.0]	2 263	63.2	[59.0–67.2]	2 266	71.6	[67.7–75.3]	2 239
55–64	76.3	[72.6–79.6]	1 730	77.5	[73.6–81.0]	1 727	76.6	[72.9–79.9]	1 726	69.7	[65.8–73.4]	1 727	72.5	[68.5–76.2]	1 712
65+	74.0	[69.7–77.9]	1 392	75.9	[71.1–80.1]	1 390	77.6	[73.9–81.0]	1 389	64.6	[59.7–69.1]	1 390	71.4	[66.9–75.5]	1 368
Locality															
Urban formal	76.8	[73.3–80.0]	8 226	78.5	[74.7–81.8]	8 194	78.1	[74.4–81.4]	8 197	65.3	[61.8–68.7]	8 206	74.5	[70.8–77.9]	8 105
Urban informal	71.0	[65.0–76.3]	1 885	68.3	[62.2–73.9]	1 876	66.9	[61.0–72.3]	1 880	56.1	[50.6–61.5]	1 880	61.7	[55.2–67.8]	1 848
Rural formal	80.7	[73.8–86.1]	1 850	77.2	[71.0–82.4]	1 846	75.3	[68.5–81.1]	1 847	68.0	[59.8–75.2]	1 847	71.5	[64.4–77.7]	1 840
Rural informal	68.4	[65.0–71.7]	3 220	67.7	[64.5–70.7]	3 215	63.8	[59.8–67.5]	3 207	62.0	[58.6–65.4]	3 212	60.9	[57.0–64.7]	3 172
Province															
Western Cape	85.2	[81.6–88.1]	2 141	90.8	[85.4–94.3]	2 135	87.8	[80.8–92.5]	2 131	68.8	[63.3–73.9]	2 134	84.6	[78.1–89.5]	2 121
Eastern Cape	68.8	[61.7–75.1]	1 622	73.2	[66.4–79.0]	1 618	67.9	[59.7–75.1]	1 619	61.9	[56.8–66.8]	1 622	67.2	[60.5–73.3]	1 602
Northern Cape	83.7	[75.4–89.7]	987	84.7	[76.7–90.3]	986	79.7	[71.3–86.2]	985	59.8	[52.9–66.4]	986	73.5	[66.0–79.9]	977
Free State	56.5	[48.6–64.1]	821	59.8	[50.8–68.1]	819	60.2	[50.4–69.3]	820	49.6	[43.7–55.5]	820	55.4	[46.5–63.8]	810
KwaZulu-Natal	72.4	[67.5–76.8]	2 524	71.9	[67.4–76.0]	2 508	69.5	[64.1–74.5]	2 510	50.1	[45.1–55.1]	2 511	61.6	[55.6–67.2]	2 470
North West	74.2	[68.8–79.0]	1 908	70.3	[64.1–75.7]	1 903	67.7	[62.0–72.9]	1 901	69.3	[63.3–74.6]	1 906	65.9	[59.8–71.6]	1 881
Gauteng	76.2	[70.2–81.3]	2 €02	75.2	[69.0–80.6]	2 595	77.3	[71.4–82.3]	2 598	68.9	[63.6–73.8]	2 598	73.7	[67.7–78.8]	2 566
Mpumalanga	83.6	[77.9–88.1]	1 333	72.8	[65.7–78.9]	1 326	68.8	[62.6–74.3]	1 327	63.0	[57.3–68.3]	1 327	70.0	[62.7–76.4]	1 311
Limpopo	69.6	[65.6–73.2]	1 243	72.1	[67.3–76.4]	1 241	68.2	[63.4–72.6]	1 240	69.4	[64.2–74.1]	1 241	64.7	[59.3–69.7]	1 227
Race															
African	71.8	[68.9–74.6]	10 077	71.2	[68.4–73.8]	10 037	69.2	[66.2–72.0]	10 042	62.5	[59.7–65.3]	10 055	66.2	[63.3–69.1]	9 916
White	81.3	[74.5–86.6]	709	83.3	[70.5–91.2]	708	84.2	[71.5–91.9]	708	70.0	[63.2–76.0]	708	78.1	[66.4–86.6]	701
Coloured	85.9	[82.8–88.5]	3 041	90.8	[88.0–93.0]	3 034	90.5	[87.5–92.8]	3 033	69.7	[65.6–73.5]	3 033	86.7	[83.5–89.3]	3 010
Asian/Indian	86.0	[81.3–89.7]	1 302	88.6	[84.4–91.8]	1 300	89.9	[86.2–92.8]	1 296	56.4	[45.5–66.8]	1 297	77.1	[72.0–81.5]	1 286
Total	74.5	[72.1–76.7]	15 181	74.7	[72.3–77.0]	15 131	73.2	[70.7–75.6]	15 131	63.8	[61.5–66.1]	15 145	69.6	[67.1–72.1]	14 965

1 Starchy food such as bread, potatoes and rice make people fat*
2 What you eat can make a difference in your chance of becoming fat*
3 What you eat can make a difference in your chance of becoming fat and getting diseases like heart disease or cancer*
4 The things I eat and drink now are healthy, so there is no need for me to make changes*
5 How much you eat and drink can make a difference in your chance of becoming fat*

95% CI: 95% confidence interval

3.6.6 Dietary behaviour

Dietary behaviour is influenced by nutrition knowledge and beliefs. Further, urbanisation and commercialisation of the food supply system is thought to affect eating patterns (Ma, Bertone, Stanek et al. 2003). The frequency of eating a meal outside the home is one of the eating patterns linked to these developments, as well as to weight gain and obesity (Ma, Bertone, Stanek et al. 2003). The sources of out-of-home foods vary depending on the context. They include street foods, restaurants and fast food take-away outlets. Studies in developed countries attribute this link to poor dietary intake comprising lower nutrient density and higher energy density (Lachat, Bao, Khan et al. 2009). Clearly, the associations between eating outside the home and dietary intake may be influenced by the kind of food choices and size of portions enjoyed by individuals and families when they eat outside the home. SANHANES-1 studied these practices in the context of being a determinant of obesity. Table 4.5.5.1 provides analyses of percentage and frequency of eating outside the home of participants 15 years of age and older, by locality, province and race.

3.6.6.1 Percentage and frequency of eating outside the home

Overall, almost half (48%) of adult South Africans reported that they have ever eaten outside the home (Table 3.6.6.1). In terms of frequency, the majority reported they ate outside the home monthly (28.7%) and weekly (28.3%). One in five participants (20.3%) reported eating outside their home more than once a month, and 19.3% ate outside their home more than once a week. There were no significant differences by sex. When it comes to age in relation to ever eating outside the home, more than once a week, and weekly, the trend decreased with age. As such, the highest percentages were among the group 15–24 years of age (52.8%, 22.9% and 31.0%, respectively). The reverse pattern was seen among participants who ate outside their home on monthly basis. In terms of locality, the percentage of people who have ever eaten outside the home was significantly higher in urban formal (57.3%) settings with more than 40% of participants in rural formal suggesting that they have ever eaten outside the home monthly. Gauteng had the highest percentage (60.6%) of participants who indicated that they had ever eaten outside the home, with Limpopo having a significantly low percentage (12.2%) in participants who indicated that they had eaten outside the home monthly. Whites (72.9%) and Indians (71.6%) had the highest prevalence of those who had ever eaten outside of home with significant differences regarding those participants who eat out of the home weekly observed between black Africans (28.6%) and Indians (18.3%), while a significant difference is seen in the group who had eaten outside the home more than once a month between coloureds (13.6%) and Indians (25.8%).

3.6.7 Dietary practices

3.6.7.1 Factors influencing food choices when grocery shopping

Food choices are influenced by several factors that lead to choice of food distribution sources (for example, retailers or farm supplies), kinds of food stuffs to purchase, and quantities and perceived quality (Steptoe & Pollard 1995). These factors include the physical environment that determines food systems and availability, cultural (values and beliefs), socio-economic including social disparities based on sex, socio-economic status, race, household structure, demographic and personal attributes such as knowledge, preferences and priorities. These factors influence availability of food, perception of what is convenient in terms of preparation time and hygiene, factors that are not static but tend to change as people's circumstances and contexts change. In this survey, factors influencing food choices when grocery shopping among males and females in relation to

Table 3.6.6.1: Prevalence and frequency of eating outside the home among all participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	Prevalence			Frequency										Total
	Have ever eaten outside the home			Have eaten outside the home ...										
				more than once a week		weekly		monthly		more than once a month		Other (specify)		
	%	95% CI	n	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex														
Male	50.0	[46.8–53.1]	6 233	21.8	[18.5–25.4]	30.9	[27.6–34.4]	26.0	[22.0–30.4]	18.7	[15.0–23.1]	2.7	[1.9–3.6]	2 865
Female	46.3	[43.6–49.1]	8 784	16.9	[14.4–19.7]	25.7	[22.8–28.8]	31.4	[28.1–34.8]	21.8	[17.6–26.7]	4.2	[3.0–5.8]	3 644
Age														
15–24	52.8	[49.5–56.2]	4 254	22.9	[19.1–27.1]	31.0	[27.6–34.6]	24.1	[20.7–27.9]	20.1	[15.4–25.9]	1.9	[1.3–2.8]	2 115
25–34	51.7	[48.0–55.4]	2 957	21.4	[18.1–25.1]	29.7	[25.8–34.0]	25.9	[21.8–30.4]	20.4	[16.2–25.4]	2.6	[1.6–4.1]	1 409
35–44	49.9	[45.8–53.9]	2 469	17.7	[14.1–21.9]	26.6	[22.8–30.7]	32.2	[27.0–37.9]	20.2	[15.7–25.6]	3.3	[2.1–5.3]	1 174
45–54	43.7	[39.9–47.6]	2 254	16.7	[12.8–21.4]	26.4	[20.8–32.9]	33.4	[28.1–39.3]	18.6	[13.8–24.5]	4.9	[3.2–7.3]	901
55–64	41.1	[35.0–47.6]	1 711	13.9	[9.8–19.3]	28.9	[17.4–44.0]	32.0	[24.0–41.3]	19.8	[14.5–26.5]	5.4	[3.0–9.4]	593
65+	29.1	[23.8–35.0]	1 368	5.8	[3.1–10.6]	11.6	[7.4–17.8]	43.5	[32.5–55.1]	26.6	[17.7–37.9]	12.5	[4.9–28.2]	318
Locality														
Urban formal	57.3	[53.5–61.1]	8 156	17.4	[14.4–20.9]	28.7	[25.1–32.5]	29.4	[25.4–33.7]	21.3	[16.3–27.2]	3.3	[2.3–4.7]	4 277
Urban informal	36.3	[32.1–40.7]	1 865	26.5	[20.7–33.1]	23.0	[19.4–27.1]	31.7	[23.5–41.3]	15.7	[10.4–23.1]	3.1	[1.8–5.1]	630
Rural formal	36.4	[31.2–41.9]	1 822	18.5	[12.9–25.8]	21.3	[15.6–28.4]	41.4	[32.1–51.4]	13.4	[9.6–18.5]	5.4	[2.4–11.9]	564
Rural informal	34.8	[31.7–37.9]	3 179	24.1	[20.2–28.4]	31.0	[26.7–35.7]	20.8	[17.3–24.8]	20.5	[15.9–26.0]	3.6	[2.4–5.6]	1 041
Province														
Western Cape	49.0	[42.9–55.2]	2 134	23.7	[18.1–30.4]	24.5	[19.4–30.4]	34.0	[27.4–41.2]	14.3	[10.3–19.5]	3.5	[2.0–5.9]	898
Eastern Cape	38.1	[33.5–43.0]	1 608	22.4	[18.1–27.5]	27.1	[22.2–32.7]	30.1	[23.9–37.1]	17.9	[13.5–23.3]	2.4	[1.1–5.2]	583
Northern Cape	45.0	[37.9–52.2]	980	16.6	[10.4–25.4]	21.7	[14.9–30.4]	39.5	[29.7–50.2]	19.1	[12.4–28.3]	3.1	[1.5–6.6]	387
Free State	48.3	[41.9–54.7]	816	24.4	[19.2–30.3]	27.7	[23.7–32.1]	22.7	[16.1–31.1]	15.3	[10.0–22.7]	9.9	[5.4–17.3]	368
KwaZulu-Natal	45.5	[39.5–51.6]	2 482	21.6	[17.4–26.6]	31.8	[24.4–40.4]	23.3	[18.8–28.6]	18.4	[14.4–23.4]	4.7	[2.1–10.1]	1 212
North West	34.1	[29.8–38.7]	1 877	20.7	[14.8–28.2]	33.1	[26.3–40.6]	33.4	[26.2–41.3]	9.1	[5.9–13.8]	3.8	[1.8–7.7]	628
Gauteng	60.6	[54.6–66.3]	2 583	13.8	[9.8–19.1]	27.6	[22.6–33.1]	31.2	[25.0–38.1]	25.5	[17.7–35.3]	1.9	[1.0–3.4]	1 525
Mpumalanga	39.4	[33.7–45.4]	1 314	30.5	[21.5–41.2]	24.8	[17.3–34.1]	31.4	[22.3–42.2]	9.1	[5.3–15.0]	4.3	[2.0–9.0]	480
Limpopo	37.7	[33.0–42.6]	1 228	24.0	[17.2–32.5]	31.7	[24.2–40.3]	12.2	[9.0–16.5]	26.4	[17.3–38.1]	5.6	[3.2–9.8]	431
Race														
African	43.5	[40.4–46.7]	9 963	21.0	[17.9–24.5]	28.6	[25.9–31.4]	27.4	[23.5–31.7]	19.9	[15.3–25.4]	3.1	[2.3–4.0]	3 775
White	72.9	[64.6–79.9]	703	9.6	[6.2–14.4]	31.3	[21.5–43.2]	29.6	[23.6–36.5]	24.6	[16.0–35.7]	4.9	[2.2–10.7]	458
Coloured	50.5	[45.5–55.6]	3 018	25.2	[20.2–30.9]	24.3	[20.0–29.2]	33.4	[26.8–40.7]	13.6	[10.5–17.4]	3.5	[2.1–5.8]	1 345
Asian/Indian	71.6	[65.1–77.4]	1 285	14.9	[11.5–19.2]	18.3	[13.4–24.5]	37.0	[29.5–45.1]	25.8	[20.2–32.2]	4.0	[2.4–6.6]	915
Total	48.0	[45.4–50.7]	15 022	19.3	[16.9–22.0]	28.3	[25.6–31.1]	28.7	[25.7–31.9]	20.3	[16.7–24.5]	3.5	[2.7–4.5]	6 512

95% CI: 95% confidence interval

food prices, safety in terms of hygiene, taste, convenience, nutrient content, how well/long the foods keep, easy preparation, and health considerations were considered.

Results

Overall at the national level, it appears as if the majority of female South Africans do grocery shopping in their homes judging from the fewer females negative responses (23.6%; Table 3.6.7.1.2; Figure 3.6.7.1) to the question regarding doing grocery shopping

Table 3.6.7.1.1: Factors influencing food choices when grocery shopping among male participants aged 15 years and older by age, locality, province and race, South Africa 2012

Males								
Background characteristics	The price of the food item		Safety (in terms of hygiene) of the food item		Taste of the food item		Convenience	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Age								
15–24	25.1	[21.3–29.3]	2.9	[1.7–4.7]	7.1	[5.4–9.3]	5.2	[3.4–8.0]
25–34	41.9	[37.2–46.8]	5.7	[4.0–8.2]	13.8	[10.9–17.4]	7.0	[4.9–9.8]
35–44	41.4	[36.9–46.1]	7.2	[5.2–9.9]	9.8	[7.6–12.6]	5.4	[3.6–8.0]
45–54	37.1	[31.7–42.7]	6.0	[4.1–8.7]	10.6	[7.4–14.9]	7.5	[4.6–12.1]
55–64	42.2	[35.5–49.1]	4.6	[2.9–7.1]	8.4	[5.8–12.1]	8.8	[3.7–19.4]
65+	34.2	[28.2–40.7]	7.0	[3.8–12.4]	10.5	[7.0–15.3]	7.7	[4.3–13.5]
Locality								
Urban formal	35.9	[31.3–40.8]	6.0	[4.5–7.9]	12.2	[10.0–14.8]	8.4	[6.1–11.5]
Urban informal	38.6	[32.1–45.5]	4.5	[2.8–7.3]	7.2	[4.6–10.9]	3.6	[2.1–6.0]
Rural formal	35.8	[28.3–44.1]	4.9	[3.0–7.7]	7.9	[5.0–12.3]	6.2	[3.3–11.3]
Rural informal	34.7	[30.5–39.1]	3.6	[2.4–5.4]	6.5	[4.8–8.8]	2.6	[1.7–4.1]
Province								
Western Cape	32.3	[26.7–38.5]	6.0	[3.3–10.6]	10.2	[7.1–14.5]	6.4	[3.7–11.0]
Eastern Cape	39.0	[33.7–44.5]	5.9	[3.5–9.8]	11.9	[8.3–16.7]	5.3	[3.1–8.8]
Northern Cape	29.6	[24.5–35.3]	3.9	[2.1–7.2]	4.0	[2.1–7.4]	3.1	[1.0–9.4]
Free State	44.6	[36.7–52.8]	9.1	[4.9–16.4]	10.3	[6.7–15.7]	7.7	[4.0–14.3]
KwaZulu-Natal	38.8	[32.1–46.1]	5.6	[3.9–8.1]	10.6	[7.9–14.0]	7.5	[3.9–13.9]
North West	41.4	[34.1–49.0]	3.7	[2.2–6.1]	12.5	[8.6–17.9]	3.7	[2.2–6.4]
Gauteng	31.0	[24.3–38.7]	4.2	[2.4–7.0]	9.9	[6.9–14.0]	7.9	[4.7–12.8]
Mpumalanga	42.1	[34.0–50.8]	6.5	[3.9–10.5]	8.1	[5.0–12.7]	7.4	[3.4–15.6]
Limpopo	36.8	[30.0–44.3]	5.1	[2.7–9.2]	6.6	[4.1–10.7]	2.4	[1.2–4.5]
Race								
African	36.1	[32.4–39.9]	4.4	[3.4–5.8]	9.2	[7.6–11.1]	4.9	[3.5–6.7]
White	35.8	[26.8–45.9]	10.2	[6.5–15.8]	15.1	[10.9–20.7]	18.3	[11.4–28.0]
Coloured	31.3	[26.5–36.6]	3.7	[2.1–6.4]	7.1	[5.1–9.6]	3.8	[2.2–6.4]
Asian/Indian	45.0	[36.2–54.1]	12.3	[8.0–18.5]	23.5	[16.2–32.7]	12.2	[7.8–18.7]
Total	35.9	[32.8–39.0]	5.2	[4.2–6.4]	10.0	[8.6–11.7]	6.4	[5.0–8.3]

95% CI: 95% confidence interval

compared to males (54.4%; Table 3.6.7.1.1). Females had significantly higher percentages than males in all the studied factors assumed to be considered by the participants when doing grocery shopping. For instance, more females than males considered the price of the food items (64.5% compared to 35.9%, respectively), safety (9.6% compared to 5.2%), taste of food (17.5% compared to 10%), nutrient content (14.1% compared to 7.4%), how well/long the food item keeps (14.1% compared to 7%) and health considerations (14.3% compared to 7.3%). There was a trend of the percentage of studied factors increasing with age in both genders. Overall, significant differences by age, locality province and race do not significantly alter the summary of the key findings.

The nutrient content of the food item		How well / how long the food item keeps		How easy the food item is to prepare		Health considerations		Don't do grocery shopping		Total
%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
4.7	[3.2–6.6]	4.5	[3.3–6.0]	2.8	[1.8–4.1]	4.2	[3.0–5.9]	66.7	[61.5–71.6]	1 970
8.4	[6.3–11.1]	7.9	[5.8–10.6]	7.8	[5.2–11.5]	8.2	[6.4–10.5]	48.7	[43.5–54.0]	1 252
8.4	[6.2–11.3]	8.2	[6.0–11.1]	5.2	[3.3–8.2]	6.8	[5.1–9.1]	46.8	[41.5–52.1]	961
9.4	[6.5–13.4]	8.8	[6.4–12.1]	2.8	[1.6–5.1]	11.6	[8.6–15.6]	51.4	[45.8–57.0]	888
9.1	[6.2–13.2]	9.5	[4.2–19.8]	4.4	[2.6–7.1]	9.4	[6.6–13.2]	48.4	[41.6–55.3]	717
6.7	[3.5–12.5]	4.8	[3.1–7.3]	3.9	[2.2–7.0]	8.7	[3.9–18.3]	56.9	[49.5–64.1]	475
8.9	[7.1–11.1]	6.7	[5.1–8.9]	5.3	[3.7–7.7]	8.1	[6.5–10.2]	52.5	[46.5–58.4]	3 445
4.7	[2.7–8.0]	7.5	[5.0–11.2]	4.4	[2.7–7.1]	5.0	[3.0–8.1]	52.2	[44.6–59.7]	734
7.4	[4.8–11.3]	9.7	[6.5–14.2]	4.2	[2.0–8.6]	6.7	[3.6–12.0]	58.8	[50.2–66.9]	845
4.8	[3.5–6.5]	6.6	[4.9–8.9]	3.3	[2.3–4.9]	6.5	[4.9–8.5]	58.4	[53.5–63.2]	1 243
8.3	[5.6–12.1]	5.8	[3.7–9.2]	3.8	[2.1–6.8]	7.6	[5.2–11.0]	62.2	[56.0–68.0]	907
7.7	[4.8–12.2]	6.0	[3.6–9.8]	6.5	[3.6–11.6]	9.1	[6.0–13.6]	54.8	[48.1–61.3]	684
1.6	[0.8–3.4]	9.7	[5.5–16.6]	2.1	[1.1–4.1]	5.7	[3.0–10.6]	67.0	[60.6–72.8]	411
8.2	[4.2–15.5]	15.4	[9.0–25.1]	4.7	[1.7–12.3]	13.1	[7.1–22.9]	46.2	[34.9–57.9]	340
8.4	[6.1–11.7]	11.1	[7.0–17.0]	3.2	[2.0–5.2]	8.6	[5.5–13.1]	50.1	[42.7–57.5]	1 059
5.3	[3.6–7.7]	2.8	[2.0–4.0]	3.6	[2.3–5.7]	3.7	[2.3–6.0]	53.8	[46.7–60.7]	745
7.3	[4.9–10.7]	4.2	[2.8–6.4]	5.4	[3.0–9.4]	4.8	[3.2–7.1]	55.6	[45.8–64.9]	1 110
8.2	[5.4–12.4]	11.5	[7.7–16.9]	6.7	[3.0–14.2]	10.0	[5.9–16.3]	54.0	[44.8–63.0]	527
6.9	[4.6–10.2]	9.7	[6.4–14.5]	3.5	[2.2–5.7]	11.6	[8.2–16.1]	50.0	[42.2–57.8]	484
6.3	[5.1–7.6]	6.8	[5.6–8.3]	4.7	[3.4–6.5]	6.2	[5.1–7.5]	55.0	[50.2–59.6]	4 065
15.6	[9.9–23.9]	9.2	[4.7–17.4]	5.9	[3.5–9.8]	14.6	[9.7–21.5]	46.3	[37.9–54.9]	326
6.0	[4.1–8.5]	4.4	[3.0–6.5]	3.0	[1.6–5.7]	5.0	[3.3–7.3]	63.8	[58.4–68.9]	1 258
12.2	[9.1–16.1]	12.4	[8.3–18.2]	4.3	[2.4–7.4]	20.0	[12.0–31.4]	38.8	[27.6–51.4]	588
7.4	[6.2–8.8]	7.0	[5.9–8.4]	4.7	[3.6–6.1]	7.3	[6.2–8.7]	54.4	[50.6–58.2]	6 267

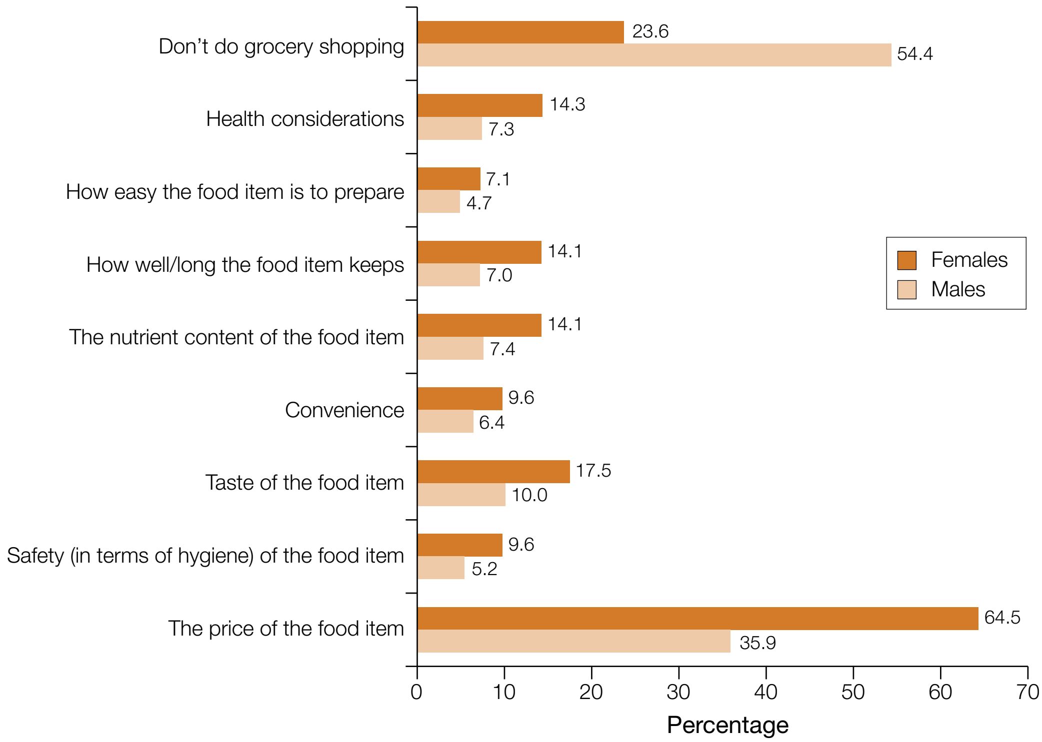
Table 3.6.7.1.2: Factors influencing food choices when grocery shopping among female participants aged 15 years and older by age, locality, province and race, South Africa 2012

Females								
	The price of the food item		Safety (in terms of hygiene) of the food item		Taste of the food item		Convenience	
Background characteristics	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Age								
15–24	43.7	[40.0–47.5]	5.0	[3.7–6.7]	11.9	[9.8–14.4]	7.0	[4.9–10.0]
25–34	69.6	[65.2–73.6]	10.1	[7.7–13.1]	19.5	[16.4–23.0]	8.6	[6.3–11.5]
35–44	75.8	[72.2–79.1]	13.5	[11.0–16.5]	21.4	[18.7–24.4]	10.6	[8.4–13.4]
45–54	77.5	[73.6–81.0]	11.9	[9.2–15.2]	20.4	[16.6–24.8]	15.2	[12.3–18.7]
55–64	72.1	[66.9–76.8]	11.7	[9.1–14.9]	20.6	[15.2–27.2]	10.9	[8.2–14.3]
65+	61.6	[55.2–67.5]	7.9	[5.5–11.2]	12.6	[9.4–16.8]	7.4	[5.2–10.4]
Locality								
Urban formal	65.3	[61.8–68.6]	12.1	[10.1–14.5]	19.9	[17.3–22.7]	11.3	[9.1–13.9]
Urban informal	70.0	[64.9–74.6]	7.2	[5.4–9.6]	14.9	[12.1–18.1]	7.2	[5.1–10.1]
Rural formal	66.5	[61.1–71.6]	6.3	[3.6–11.0]	15.5	[11.0–21.4]	8.5	[5.0–14.1]
Rural informal	60.3	[57.1–63.5]	5.9	[4.5–7.6]	13.8	[11.7–16.3]	7.0	[5.4–9.0]
Province								
Western Cape	65.4	[61.7–68.8]	10.6	[7.4–15.0]	19.7	[15.7–24.3]	6.9	[5.1–9.4]
Eastern Cape	65.8	[61.1–70.2]	9.5	[6.6–13.4]	15.9	[12.5–20.1]	9.3	[6.6–13.0]
Northern Cape	68.9	[62.4–74.8]	10.4	[6.5–16.2]	13.3	[7.9–21.5]	8.0	[4.9–12.7]
Free State	72.8	[67.8–77.2]	13.2	[9.0–19.0]	12.4	[7.7–19.3]	11.2	[6.7–18.2]
KwaZulu-Natal	60.6	[54.7–66.2]	11.4	[8.0–16.2]	18.4	[14.1–23.8]	10.1	[7.7–13.3]
North West	65.2	[59.0–70.8]	9.5	[7.2–12.6]	20.5	[16.3–25.4]	7.1	[5.2–9.7]
Gauteng	64.3	[58.8–69.4]	9.0	[6.6–12.2]	17.9	[14.3–22.1]	11.6	[8.0–16.4]
Mpumalanga	69.7	[62.9–75.7]	7.5	[4.4–12.5]	15.2	[11.0–20.6]	13.1	[8.5–19.7]
Limpopo	61.2	[55.6–66.6]	6.6	[4.3–10.1]	15.8	[12.4–19.9]	5.3	[3.3–8.5]
Race								
African	63.1	[60.6–65.6]	8.3	[7.1–9.8]	15.7	[14.2–17.4]	8.6	[7.1–10.4]
White	70.9	[63.3–77.5]	16.5	[11.5–23.2]	29.3	[22.4–37.3]	16.3	[10.6–24.3]
Coloured	67.5	[64.3–70.6]	9.2	[6.6–12.6]	15.5	[12.1–19.6]	7.7	[5.9–10.0]
Asian/Indian	69.5	[64.2–74.3]	20.8	[14.7–28.7]	27.7	[19.8–37.4]	16.4	[10.8–24.2]
Total	64.5	[62.3–66.7]	9.6	[8.3–11.0]	17.5	[15.8–19.3]	9.6	[8.1–11.2]

95% CI: 95% confidence interval

The nutrient content of the food item		How well / how long the food item keeps		How easy the food item is to prepare		Health considerations		Don't do grocery shopping		Total
%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
7.5	[6.1–9.3]	8.0	[6.5–9.9]	4.2	[2.7–6.5]	8.2	[6.8–9.9]	47.7	[43.6–51.8]	2 314
14.0	[10.9–17.6]	16.1	[13.6–19.0]	8.7	[7.0–10.9]	13.4	[10.8–16.6]	17.6	[14.8–20.8]	1 736
19.3	[15.8–23.2]	18.4	[15.6–21.6]	7.7	[5.9–9.9]	18.8	[15.8–22.1]	8.6	[6.7–10.9]	1 526
16.4	[12.7–20.9]	17.5	[14.7–20.7]	10.2	[7.1–14.4]	16.2	[13.1–20.0]	11.5	[8.7–15.0]	1 373
17.2	[13.3–22.0]	14.8	[11.8–18.4]	7.2	[5.0–10.2]	19.7	[14.0–27.1]	14.0	[11.2–17.3]	1 011
16.0	[10.9–22.9]	11.4	[7.1–17.7]	4.9	[3.3–7.0]	16.6	[11.6–23.4]	28.1	[23.3–33.4]	919
17.4	[14.5–20.9]	13.3	[11.2–15.8]	8.2	[6.5–10.3]	17.1	[14.5–20.1]	21.1	[18.2–24.3]	4 775
11.1	[8.0–15.1]	13.6	[9.8–18.5]	6.5	[4.9–8.5]	10.3	[7.2–14.4]	20.6	[17.4–24.3]	1 140
13.7	[9.3–19.8]	15.8	[11.2–22.0]	5.5	[3.7–8.1]	8.3	[5.5–12.2]	26.7	[22.0–32.0]	997
8.0	[6.4–10.0]	15.3	[12.7–18.3]	5.2	[3.9–7.0]	11.3	[9.4–13.7]	29.2	[26.4–32.2]	1 972
15.4	[12.1–19.5]	15.4	[11.8–19.9]	5.7	[4.0–8.1]	19.3	[14.8–24.9]	26.3	[23.2–29.6]	1 235
10.7	[7.0–16.0]	10.5	[7.7–14.0]	5.0	[2.9–8.3]	14.3	[10.0–19.9]	23.6	[19.9–27.7]	939
9.4	[5.9–14.7]	13.3	[8.8–19.8]	7.9	[4.9–12.6]	14.4	[10.2–20.0]	23.2	[17.9–29.5]	584
7.9	[4.7–12.8]	31.8	[22.1–43.4]	4.6	[2.0–10.6]	16.0	[10.7–23.2]	17.5	[13.7–22.1]	478
14.8	[11.3–19.2]	21.7	[17.3–26.8]	6.0	[4.2–8.6]	14.5	[10.2–20.4]	22.9	[18.7–27.6]	1 456
13.5	[10.4–17.4]	10.0	[7.1–13.8]	6.0	[4.2–8.5]	7.7	[5.4–10.9]	28.4	[23.2–34.1]	1 157
18.9	[14.1–24.8]	8.2	[6.3–10.6]	9.9	[7.0–13.6]	13.6	[10.5–17.4]	21.5	[16.8–27.1]	1 489
9.9	[7.5–13.0]	16.6	[11.6–23.2]	7.0	[3.8–12.6]	16.0	[11.7–21.6]	24.1	[18.5–30.8]	787
6.8	[4.7–9.8]	15.9	[12.0–20.8]	5.9	[4.2–8.1]	14.7	[11.0–19.4]	26.8	[22.7–31.4]	759
11.3	[9.5–13.3]	13.6	[12.0–15.5]	6.5	[5.5–7.5]	11.9	[10.5–13.5]	24.5	[22.2–27.0]	5 980
32.9	[25.6–41.0]	15.2	[10.0–22.4]	12.4	[6.9–21.3]	31.1	[22.9–40.8]	16.0	[11.7–21.5]	384
13.2	[10.2–16.9]	14.9	[11.5–18.9]	5.9	[4.3–8.0]	12.0	[9.3–15.2]	25.8	[23.1–28.7]	1 785
23.8	[16.9–32.3]	19.2	[12.8–27.7]	6.6	[4.4–9.7]	23.0	[18.2–28.6]	19.1	[15.5–23.3]	714
14.1	[12.3–16.1]	14.1	[12.6–15.7]	7.1	[6.0–8.3]	14.3	[12.7–16.1]	23.6	[21.7–25.6]	8 884

Figure 3.6.7.1: Factors influencing grocery shopping among all participants aged 15 years and older by gender, South Africa 2012



Discussion

Selected aspects of the findings are discussed.

General nutrition knowledge

There exists a large body of empirical international evidence pointing to a causal effect of education on health knowledge (Conti, Heckman & Urzua 2010). For instance, evidence suggests that education improves health knowledge, which in turn translates into a better choice of health behaviours. South African researchers have clearly shown that there is a lack of health knowledge in the country, despite the improved education level in the recent years (Steyn, Senekal, Brits et al. 2000; Kruger, Venter, Vorster et al. 2002; Mchiza 2008 (PhD thesis)). For example, in a study measuring health knowledge of preadolescent children and their mothers, the authors concluded that mothers' and their daughters' knowledge scores were low for food high in fat, salt and sugar (Mchiza et al. 2007). Moreover, fewer preadolescent girls of different ethnicities knew the suitable amount of time to engage in physical activity (Mchiza et al. 2007). These results may contribute in part to the development of nutritional status disorders in South Africa. The general nutrition knowledge results of SANHANES-1 corroborate those of previous studies, which maintain that the nutrition knowledge of the South African population is inadequate.

There is general anecdotal evidence suggesting that the more educated have more health knowledge. The hypothesis behind this evidence is that: 'schooling influences health mainly through its impact on one's education level that also influences one's income.' This anecdotal evidence also suggests that the wealthy are better off in terms of health knowledge since they have means to access health information whenever they can. The poor on the other hand may be most vulnerable in terms of health knowledge since they do not have means of accessing health. However, there is clear evidence that this might not be always the case, since the majority of South Africans regardless of their financial status and education level have inadequate health knowledge. As such, appropriate strategies directed at increasing/improving health knowledge need to be directed towards both groups, namely, the most vulnerable (the poor, in this case), as well as groups that are well off.

Beliefs regarding developing obesity

Kruger, Venter, Vorster et al. 2002 have shown that physical activity and the knowledge regarding obesity-related health consequences in South Africa are negatively associated to both male and female BMI. These results suggest that the health knowledge of South Africans remains a potential target to improve the adoption of healthy behaviours in an attempt to combat obesity and its co-morbidities. For example, South Africa is recognised for its diversity in culture, traditional beliefs and attitudes. However, with increasing urbanisation, the majority of the population has adopted a westernised lifestyle (Steyn, Burger, Monyeki et al. 2001). Indeed, in South Africa, despite the influence of urbanisation on some dietary habits, it appears as if some body image – and food – attitudes and beliefs that were internalised by black individuals during early socialisation within families are still adhered to (Puoane, Matwa, Bradley et al. 2006; Hughes, Puoane, Bradley et al. 2006). Attitudes, beliefs and behaviours identified to resist change include individuals' general perceptions about food, the meaning of food in relation to health, the relationship of food to body size and image, the social meaning of food, the values attached to food, as well as food portion sizes (Puoane, Matwa, Bradley et al. 2006; Hughes, Puoane, Bradley et al. 2006; Steyn, Burger, Monyeki et al. 2001). However, in these South African studies, ethnic identity and self-esteem in relation to the stability of these food-related attitudes, beliefs and behaviours were not explored. It is interesting to note that the results of SANHANES-1 indicate that among race groups, black Africans, had the lowest rates for all beliefs regarding the development of obesity.

Dietary behaviour

Besides the social and cultural norms, behavioural adoption may also be facilitated by an individual's perceived self-efficacy. Furthermore, studies in South Africa have shown a clear association between a lack of knowledge regarding healthy food choices, food preparation, and acceptable portion sizes and BMI (Kruger, Venter, Vorster et al. 2002; c). Studies have also shown that social and physical environmental factors drive unhealthy behaviours of individuals (Schneider, Norman, Steyn et al. 2007; Steyn, Burger, Monyeki et al. 2001; Reddy, Panday, Swart et al. 2003; McVeigh, Norris, De Wet et al. 2004) via various mechanisms including: i) the abundance of energy dense foods that are used as a means of socialising (Hughes, Puoane, Bradley et al. 2006), ii) the proliferation of fast food outlets and vendors that serve high fat cuts of meats (Bradley & Puoane 2007), iii) the over-use of technology-based equipment (Reddy, Panday, Swart et al. 2003; McVeigh, Norris, De Wet et al. 2004), as well as iv) reliance on automobiles for transportation, overcrowding and crime that reduces participation in physical activities (Prista, Maia, Saranga et al. 2005; Bradley & Puoane 2007; SA MRC 2007). It is, therefore, essential that resources are directed at understanding these so-called social-, and physical- environments that discourage South Africans from adopting appropriate healthy behaviours. The results of SANHANES-1 indicate that the younger generation (15–24 years of age) are more likely to have meals that are prepared outside the home, a practice shared by those who live in urban formal settings thus underscoring the effects of urbanisation and globalisation on dietary habits and behaviour.

There is evidence to suggest unhealthy behaviours to be more detrimental in middle- and older age groups of individuals (NHLBI 1998; Kumanyika, Morssink, Nestle et al. 2001). However, implementation of health behaviour modification interventions at these age groups have been shown to produce short-term benefits (NHLBI 1998; Hemmingsson, Page, Fox et al. 2001). In the longer term, interventions implemented early in life may improve individuals' adaptation to health behaviours (Nelson, Gordon-Larsen, Adair et al. 2005; Van Horn, Obarzanek, Friedman et al. 2005) and have a potential to prevent and reduce the health complications (that is to say, obesity and its co-morbidities) later in life (Stevens, Kumanyika, Keil et al. 1994). Moreover, adopting these health behaviours early in life has a tendency to track into adulthood (Nelson, Gordon-Larsen, Adair et al. 2005; Telama, Yang, Viikari et al. 2005; Dennison, Strauss, Mellits et al. 1998; Kuh & Cooper 1992). This is particularly important in relation to the findings in this survey that health considerations were not so prominent a factor in influencing food choices.

3.6.8 Body image and weight management

Body image is one of the most important psychosocial factors that influence body status of individuals. Various international studies suggest that body image is multidimensional (Brewis, McGarvey, Jones et al. 1998; Bulik, Wade, Heath et al. 2001; Fitzgibbon, Blackman, Avellone et al. 2000; Markovic, Votava-Raic, Nikolic et al. 1998; Cooper, Taylor, Cooper et al. 1987). The dimensions of body image include the perception of body size status, the attitudes and dissatisfaction regarding body size status, the level and direction of body size dissatisfaction, as well as body size concerns.

These dimensions are thought to determine an individual's preference for thinness or fatness, and also determine their intentions to adopt healthy lifestyle behaviours such as eating healthily and/or engaging in physical activity. There is a growing concern that the South African population is increasingly becoming obese and that obesity is an important contributor to morbidity and mortality among adults. Concerns that emphasise the contribution of genetic risk to obesity could unintentionally discourage people from adopting positive lifestyle behaviours. This has led to the provision of health promotion information that emphasises the capacity of individuals to manage their weight (Wang & Coups 2010). But perceptions of body size, body size concerns, as well as individuals' views about whether or not they have control over their bodily appearance, are influenced by the socio-cultural milieu that either encourages thinner or fuller bodies, and the individuals' knowledge and beliefs about the health benefits, as well as diseases associated with being overweight. Steyn et. al. (2010) state that obesity in South Africa, particularly among black African women – the group with the highest risk – is attributable to social meanings that attach wellbeing to weight gain and lack of access to affordable healthy food choices, together with decreased opportunities of physical activity in non-rural areas.

Perception of body size can be defined as the accuracy of an individual's judgment of their size brought about by the way they see themselves (Cash, Grant, Shovlin et al. 1992; Dawson 1988; Madrigal, Sancez-Villegas, Martinez-Gonzalez et al. 2000). To measure perceptual body image accurately, individuals can select a body figure from a set of silhouettes that closely resembles their body size status – the Figure Rating Scale (FRS). The silhouettes range from the very thin to very heavy (Stunkard, Sorensen & Schulsinger et al. 1983, for adults and Stevens, Cornell, Story et al. 1999, for children). This approach was used in the present survey. An individual's perceived body image as selected from the body image silhouettes can be compared to the individual's actual measured body size (actual BMI) to determine how accurately an individual perceives their body image (Mciza, Goedecke, Steyn et al. 2005; Mchiza et al., 2011).

Further, individuals can select the silhouette that resembles their ideal (the one they wanted to look like) from the same set of silhouettes. The feel-ideal difference (FID) index score (determined when the score of the silhouettes representing 'ideal' is subtracted from the score of the silhouette representing 'perception') is then used to determine an individual's attitude towards their own body size (Mchiza, Goedecke, Steyn et al. 2005). A higher FID Index score represents greater body size dissatisfaction, whereas a FID index score that approaches zero, represents less body size dissatisfaction. An FID index score that is equal to zero determines that an individual is satisfied about their body size status. An FID index score can be either negative (meaning that an individual prefers to be smaller in size) or positive (meaning that an individual prefers to be bigger in size). These desires can then motivate individuals to either want to lose or gain weight, thus different individuals will adopt different weight management strategies to reach their desired weight/body size.

Percentage of happiness with current weight

Overall, significantly more males (69.2%) than females (63.3%) were happy with their current weight and fewer males (13.3%) than females (18.1%) were unhappy with their current weight (Table 3.6.8.1). In the group that indicated they were happy with their current weight, there was a trend of decreasing percentage of happiness with age in both sexes. Fewer females in an urban formal setting (58.9%) seemed to be happy about their current weight status. More males in urban informal (18.2%) settings seemed to be unhappy about their current status of weight. More females in urban formal (19.2%) settings seemed to be unhappy about their current status of weight. In the group that indicated particiants were happy, there were no significant differences in males across all provinces. More black Africans (males 70.4% and females 65.5%) in both sexes indicated, significanlty so, that they were happy with their current weight when compared with Indians males (55.6%), and Indian (52.4%) and white (53.0%) females.

Attempts to lose or gain weight in the last 12 months

Overall, significantly more South Africans (11.5%) attempted to lose weight than gain weight (8.6%) over the last 12 months (Table 3.6.8.2). There were no significant gender differences among those who attempted to gain weight; however, significantly more females (14.6%) attempted to lose weight than males (8%).

There was an overall decreasing trend in the percentage of participants to gain weight, decreasing with age in both sexes. In males who attempted to gained weight, those 15–24 years of age had a significantly higher rate (13.2%) when compared with all other age groups. Moreover, the group 15–24 years of age of females were more likely to attempt to gain weight (11.1%) than those 45–54 years of age (5.7%) and those 65 years of age and older (3.6%). In males who attempted to lose weight, those 45–54 years of age (13.1%) had a significantly higher rate than those 15–24 years of age (6.7%) and those 35–44 years of age (6.3%). Females 35–44 years of age had a significantly higher percentage (18.9%) than those 15–24 years of age (12.2%) who had attempted to lose weight.

Urban informal males had a significantly higher rate (16.7%) of attempts to gain weight compared with rural formal (6.6%) and urban formal (8%) males. Rural informal females had a significantly higher rate (10.8%) than those in urban formal settings (6.4%).There were no significant differences between localities for males who attempted to loseweight. For females, there was a significantly higher rate (18.2%) in urban formal settings compared to all other localities (range 8.9% to 10.2%).

Table 3.6.8.1: Prevalence of happiness with current weight of among all participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	Male								
	Happy		Somewhat happy		Unhappy		Other		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age									
15–24	75.2	[72.4–77.7]	13.3	[11.2–15.7]	11.5	[9.7–13.6]	0.1	[0.0–0.3]	1 962
25–34	66.3	[62.5–70.0]	19.0	[15.9–22.5]	14.3	[11.3–18.0]	0.3	[0.1–1.0]	1 252
35–44	67.6	[62.5–72.3]	19.8	[15.5–25.0]	12.3	[9.5–15.7]	0.3	[0.1–0.8]	952
45–54	65.2	[60.1–69.9]	16.3	[12.9–20.5]	18.1	[14.0–23.2]	0.4	[0.1–1.2]	878
55–64	64.3	[57.2–70.8]	21.8	[16.2–28.7]	13.7	[10.3–17.9]	0.2	[0.0–1.5]	709
65+	73.9	[68.2–78.9]	16.3	[12.4–21.1]	9.3	[6.4–13.4]	0.5	[0.2–1.4]	461
Locality									
Urban formal	67.6	[64.4–70.7]	19.5	[16.9–22.4]	12.6	[10.3–15.3]	0.2	[0.1–0.5]	3 366
Urban informal	66.2	[61.5–70.6]	15.4	[11.9–19.8]	18.2	[13.7–23.8]	0.2	[0.1–0.9]	766
Rural formal	70.6	[64.7–75.8]	20.6	[15.7–26.6]	8.4	[5.4–12.7]	0.5	[0.2–1.3]	844
Rural informal	73.8	[70.3–77.0]	11.3	[9.1–13.9]	14.7	[12.4–17.4]	0.2	[0.1–0.7]	1 245
Province									
Western Cape	61.7	[55.2–67.7]	22.8	[17.6–28.9]	15.2	[11.2–20.3]	0.3	[0.1–1.7]	888
Eastern Cape	70.1	[64.6–75.1]	11.9	[8.5–16.5]	17.6	[14.5–21.3]	0.4	[0.1–1.5]	684
Northern Cape	75.5	[67.7–81.9]	11.6	[8.0–16.4]	12.3	[6.9–20.8]	0.6	[0.1–3.0]	411
Free State	64.4	[56.2–71.8]	7.6	[4.2–13.6]	27.5	[20.1–36.4]	0.5	[0.1–3.1]	333
KwaZulu-Natal	68.3	[62.4–73.7]	11.6	[9.0–14.9]	19.9	[15.2–25.6]	0.2	[0.0–0.7]	1 048
North West	66.9	[62.0–71.4]	24.8	[20.0–30.3]	7.4	[5.1–10.7]	0.9	[0.4–2.1]	732
Gauteng	70.7	[66.2–74.7]	21.3	[17.7–25.4]	8.0	[5.7–11.1]	0.0	[0.0–0.2]	1 101
Mpumalanga	76.9	[69.8–82.7]	13.2	[8.1–20.9]	9.5	[7.0–12.7]	0.4	[0.1–2.0]	527
Limpopo	73.2	[66.9–78.8]	12.7	[9.1–17.5]	14.0	[10.1–19.2]	0.0		497
Race									
African	70.4	[68.2–72.5]	15.9	[14.0–17.9]	13.4	[11.6–15.5]	0.3	[0.2–0.5]	4 042
White	66.4	[56.7–74.9]	23.8	[16.5–33.2]	9.7	[6.1–15.2]	0.0		316
Coloured	66.5	[60.5–72.0]	20.4	[16.9–24.5]	12.9	[9.6–17.0]	0.2	[0.1–0.6]	1 246
Asian/Indian	55.6	[44.8–65.9]	19.6	[14.4–26.0]	24.2	[12.9–40.9]	0.6	[0.1–4.2]	585
Total	69.2	[67.1–71.3]	17.2	[15.5–19.1]	13.3	[11.7–15.0]	0.3	[0.1–0.4]	6 221

95% CI: 95% confidence interval

In males who attempted to gain weight, those in Northern Cape represented a significantly lower percentage (3.8%) compared to all other provinces (range 11.2% to 17.8%) except North West, Gauteng and Mpumalanga. In females, Free State had a significantly higher percentage (14.5%) compared to Western Cape, Northern Cape, Gauteng and Mpumalanga. In males who attempted to lose weight, Western Cape had a significantly higher percentage (12.8%) compared with those in Northern Cape, Mpumalanga, North West and Gauteng (range 5.0% to 5.8%). In females, similar results were seen, Western Cape had a significantly higher percentage (20.5%) compared to all other provinces, except Eastern Cape, Free State and KwaZulu-Natal.

	Female									
	Happy		Somewhat happy		Unhappy		Other		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
	65.5	[61.6–69.2]	17.0	[13.6–21.0]	17.3	[14.6–20.4]	0.2	[0.1–0.5]	2 284
	62.4	[58.5–66.1]	19.7	[16.2–23.8]	17.7	[14.6–21.2]	0.3	[0.1–0.5]	1 733
	61.6	[57.9–65.2]	18.1	[15.1–21.6]	19.7	[16.9–22.9]	0.5	[0.2–1.3]	1 520
	61.9	[57.8–65.8]	20.3	[16.8–24.2]	17.3	[14.3–20.7]	0.6	[0.2–2.3]	1 345
	61.5	[55.7–67.0]	17.2	[13.4–22.0]	21.0	[15.7–27.5]	0.2	[0.1–0.9]	1 009
	66.5	[60.9–71.7]	17.0	[13.7–20.8]	16.3	[12.2–21.5]	0.2	[0.0–0.6]	917
	58.9	[55.6–62.0]	21.5	[18.7–24.7]	19.2	[16.4–22.4]	0.3	[0.1–0.8]	4 716
	66.3	[62.1–70.3]	14.5	[11.1–18.7]	18.9	[14.8–23.9]	0.2	[0.1–0.7]	1 155
	68.4	[62.9–73.4]	19.8	[14.0–27.2]	11.7	[8.5–15.7]	0.2	[0.0–1.2]	1 011
	70.0	[66.7–73.0]	12.5	[10.3–15.1]	17.1	[14.4–20.3]	0.4	[0.2–0.8]	1 931
	56.8	[50.8–62.6]	19.9	[15.4–25.2]	22.9	[18.5–28.1]	0.4	[0.2–1.0]	1 213
	60.8	[55.6–65.7]	14.4	[10.6–19.4]	24.0	[19.2–29.6]	0.7	[0.2–2.6]	921
	72.4	[65.4–78.4]	14.6	[10.0–20.9]	13.0	[9.4–17.7]	0.0	[0.0–0.3]	585
	59.4	[54.3–64.2]	8.3	[5.8–11.9]	32.3	[27.9–37.0]	0.1	[0.0–0.2]	471
	63.0	[57.2–68.4]	10.8	[7.1–16.0]	25.9	[21.2–31.2]	0.4	[0.1–0.9]	1 438
	65.8	[60.7–70.5]	24.6	[20.4–29.3]	9.2	[6.6–12.7]	0.4	[0.1–1.3]	1 144
	61.7	[56.8–66.3]	25.3	[21.0–30.3]	12.7	[9.2–17.4]	0.3	[0.1–1.2]	1 488
	75.2	[70.0–79.7]	10.5	[7.4–14.6]	14.1	[10.3–19.1]	0.3	[0.1–1.0]	797
	69.6	[64.5–74.2]	15.6	[12.3–19.6]	14.6	[10.9–19.4]	0.2	[0.0–1.3]	756
	65.5	[63.2–67.7]	16.2	[14.4–18.3]	17.9	[15.9–20.2]	0.4	[0.2–0.7]	5 924
	53.0	[43.9–61.9]	30.3	[21.5–40.8]	16.7	[11.0–24.7]	0.0		406
	59.4	[55.4–63.4]	21.9	[18.8–25.4]	18.2	[15.4–21.3]	0.5	[0.2–1.1]	1 755
	52.4	[45.4–59.3]	17.9	[11.9–26.0]	29.1	[19.2–41.7]	0.5	[0.1–2.7]	706
	63.3	[61.2–65.3]	18.3	[16.5–20.3]	18.1	[16.3–20.0]	0.3	[0.2–0.6]	8 807

More black African (9.8%) and coloured (12.8%) males attempted to gain weight than their white counterparts (2.1%). Similar results were seen in females, with higher percentages of black Africans (8.7%) and coloureds (8.4%) compared to their white counterparts (2.3%). In males who attempted to lose weight, significantly fewer black Africans (7.1%) were observed than Indians (16.2%). In females, black Africans had a significantly lower percentage (11.9%) compared to all other race groups (range 19.3% to 28.1%).

Table 3.6.8.2: Percentage participants aged 15 years and older who attempted to lose or gain weight in the last 12 months by sex, age, locality, province and race, South Africa 2012

Background characteristics	Males									
	Attempted to gain weight					Attempted to lose weight				
	Yes		No		Total	Yes		No		Total
	%	95% CI	%	95% CI	n	%	95% CI	%	95% CI	n
Age										
15–24	13.2	[11.1–15.7]	86.8	[84.3–88.9]	1 951	6.7	[5.3–8.5]	93.3	[91.5–94.7]	1 954
25–34	9.4	[7.5–11.8]	90.6	[88.2–92.5]	1 243	8.7	[6.4–11.6]	91.3	[88.4–93.6]	1 247
35–44	7.7	[5.4–10.7]	92.3	[89.3–94.6]	948	6.3	[4.5–8.8]	93.7	[91.2–95.5]	951
45–54	6.3	[4.4–8.9]	93.7	[91.1–95.6]	877	13.1	[9.1–18.4]	86.9	[81.6–90.9]	879
55–64	5.7	[3.7–8.7]	94.3	[91.3–96.3]	706	8.2	[5.8–11.3]	91.8	[88.7–94.2]	710
65+	4.4	[2.8–6.8]	95.6	[93.2–97.2]	455	5.4	[2.3–12.2]	94.6	[87.8–97.7]	458
Locality										
Urban formal	8.0	[6.6–9.8]	92.0	[90.2–93.4]	3 347	8.9	[7.0–11.2]	91.1	[88.8–93.0]	3 361
Urban informal	16.7	[12.9–21.4]	83.3	[78.6–87.1]	768	6.1	[4.0–9.1]	93.9	[90.9–96.0]	768
Rural formal	6.6	[4.0–10.8]	93.4	[89.2–96.0]	832	5.6	[3.6–8.8]	94.4	[91.2–96.4]	839
Rural informal	10.0	[7.9–12.6]	90.0	[87.4–92.1]	1 240	7.6	[5.8–9.9]	92.4	[90.1–94.2]	1 238
Province										
Western Cape	12.1	[9.5–15.5]	87.9	[84.5–90.5]	877	12.8	[9.1–17.6]	87.2	[82.4–90.9]	885
Eastern Cape	13.4	[10.1–17.5]	86.6	[82.5–89.9]	674	11.0	[7.7–15.4]	89.0	[84.6–92.3]	678
Northern Cape	3.8	[1.9–7.3]	96.2	[92.7–98.1]	410	5.0	[2.8–9.0]	95.0	[91.0–97.2]	411
Free State	17.8	[11.8–25.9]	82.2	[74.1–88.2]	335	11.8	[7.0–19.1]	88.2	[80.9–93.0]	333
KwaZulu-Natal	11.2	[8.5–14.8]	88.8	[85.2–91.5]	1 047	8.7	[6.2–12.1]	91.3	[87.9–93.8]	1 045
North West	8.1	[5.7–11.3]	91.9	[88.7–94.3]	727	5.6	[3.5–8.9]	94.4	[91.1–96.5]	732
Gauteng	5.1	[3.5–7.3]	94.9	[92.7–96.5]	1 097	5.5	[3.5–8.6]	94.5	[91.4–96.5]	1 103
Mpumalanga	6.1	[3.7–9.7]	93.9	[90.3–96.3]	527	5.3	[3.7–7.5]	94.7	[92.5–96.3]	528
Limpopo	11.4	[7.7–16.7]	88.6	[83.3–92.3]	493	9.1	[6.0–13.7]	90.9	[86.3–94.0]	491
Race										
African	9.8	[8.4–11.4]	90.2	[88.6–91.6]	4 027	7.1	[5.8–8.7]	92.9	[91.3–94.2]	4 035
White	2.1	[0.9–4.9]	97.9	[95.1–99.1]	308	9.8	[6.3–14.9]	90.2	[85.1–93.7]	312
Coloured	12.8	[10.0–16.2]	87.2	[83.8–90.0]	1 237	11.7	[8.7–15.7]	88.3	[84.3–91.3]	1 245
Asian/Indian	7.7	[4.8–12.1]	92.3	[87.9–95.2]	583	16.2	[11.6–22.1]	83.8	[77.9–88.4]	582
Total	9.2	[8.1–10.5]	90.8	[89.5–91.9]	6 187	8.0	[6.8–9.4]	92.0	[90.6–93.2]	6 206

95% CI: 95% confidence interval

Females									
Attempted to gain weight					Attempted to lose weight				
Yes		No		Total	Yes		No		Total
%	95% CI	%	95% CI	n	%	95% CI	%	95% CI	n
11.1	[9.3–13.2]	88.9	[86.8–90.7]	2 269	12.2	[10.1–14.6]	87.8	[85.4–89.9]	2 273
7.9	[6.3–9.9]	92.1	[90.1–93.7]	1 720	15.5	[12.8–18.7]	84.5	[81.3–87.2]	1 728
8.2	[6.5–10.3]	91.8	[89.7–93.5]	1 507	18.9	[15.7–22.7]	81.1	[77.3–84.3]	1 508
5.7	[4.2–7.6]	94.3	[92.4–95.8]	1 342	14.7	[12.1–17.6]	85.3	[82.4–87.9]	1 344
6.5	[4.4–9.5]	93.5	[90.5–95.6]	1 007	15.3	[10.2–22.4]	84.7	[77.6–89.8]	1 007
3.6	[2.3–5.4]	96.4	[94.6–97.7]	914	9.5	[5.0–17.6]	90.5	[82.4–95.0]	917
6.4	[5.3–7.8]	93.6	[92.2–94.7]	4 685	18.2	[15.5–21.3]	81.8	[78.7–84.5]	4 701
10.7	[7.5–15.0]	89.3	[85.0–92.5]	1 149	10.2	[7.9–13.1]	89.8	[86.9–92.1]	1 147
6.0	[4.2–8.3]	94.0	[91.7–95.8]	1 006	8.9	[6.2–12.6]	91.1	[87.4–93.8]	1 008
10.8	[9.0–13.0]	89.2	[87.0–91.0]	1 924	10.3	[8.6–12.3]	89.7	[87.7–91.4]	1 926
8.2	[6.3–10.5]	91.8	[89.5–93.7]	1 208	20.5	[16.8–24.8]	79.5	[75.2–83.2]	1 212
11.1	[8.4–14.4]	88.9	[85.6–91.6]	917	18.8	[13.9–25.0]	81.2	[75.0–86.1]	917
6.5	[3.9–10.6]	93.5	[89.4–96.1]	582	10.3	[7.0–15.0]	89.7	[85.0–93.0]	582
14.5	[11.0–19.0]	85.5	[81.0–89.0]	472	23.2	[17.5–30.1]	76.8	[69.9–82.5]	473
8.6	[6.3–11.5]	91.4	[88.5–93.7]	1 434	18.6	[13.8–24.6]	81.4	[75.4–86.2]	1 425
7.1	[4.9–10.3]	92.9	[89.7–95.1]	1 132	6.8	[4.6–9.8]	93.2	[90.2–95.4]	1 136
4.7	[3.2–6.8]	95.3	[93.2–96.8]	1 482	11.8	[8.8–15.7]	88.2	[84.3–91.2]	1 488
6.6	[4.2–10.2]	93.4	[89.8–95.8]	786	10.2	[7.2–14.3]	89.8	[85.7–92.8]	794
12.0	[8.6–16.5]	88.0	[83.5–91.4]	751	12.6	[9.4–16.7]	87.4	[83.3–90.6]	755
8.7	[7.6–10.0]	91.3	[90.0–92.4]	5 883	11.9	[10.5–13.5]	88.1	[86.5–89.5]	5 898
2.3	[1.0–5.1]	97.7	[94.9–99.0]	405	28.1	[20.1–37.7]	71.9	[62.3–79.9]	406
8.4	[6.8–10.4]	91.6	[89.6–93.2]	1 748	19.3	[16.3–22.6]	80.7	[77.4–83.7]	1 748
6.5	[4.1–10.2]	93.5	[89.8–95.9]	706	23.4	[16.2–32.5]	76.6	[67.5–83.8]	708
8.0	[7.0–9.0]	92.0	[91.0–93.0]	8 758	14.6	[13.0–16.4]	85.4	[83.6–87.0]	8 776

Ideal body image

Overall, 87.9% of South Africans indicated that their ideal body image was 'fat', while only 12% indicated that they had a normal ideal body image and 0.1% indicated they had a very thin ideal body image (results not presented). There were no significant differences for males across age, locality, province and race groups. In females that had a normal ideal body image, the only significant differences were found in locality, between urban formal (15.6%) and rural informal (12%) and province, where females in Western Cape had the highest percentage (23.2%) compared to all other provinces, and race groups, where black African had a lower percentage (12.9%) compared to the whites (22.9%). In females who had a fat ideal body image, the only significant difference occurred provincially, with Western Cape having the overall lowest rate of fat body image (76.5%) when compared with all other provinces (range 80.4% to 89.9%).

Correctness of perception of body image

While, more than 96% of South Africans were able to correctly identify a 'thin' and 'fat' body image based on body image silhouettes, only 9.6% and 14.2% of males and females respectively were able to correctly identify a 'normal' body weight image with females being significantly more likely to identify normal body weight than males (results not presented). There were no significant differences between age, locality and race. However, there was a significant difference amongst females in Western Cape (23.2%) compared wih those in the Mpumalanga, Limpopo, Gauteng, North West and the Eastern Cape where the percentage was less than 13%.

Perceived compared to ideal BMI

Overall, 41.9% of South Africans had perceived BMIs that were equal to their ideal BMI, with the remaining 27.8% and 30.3% having perceived BMIs higher and lower than their ideal BMI, respectively.

While a similar percentage of males (43.0%) and females (40.9%) indicated their perceived BMI was equal to their ideal BMI, significantly more females (33%) than males (22%) indicated their perceived BMI was higher than their ideal BMI, and significantly fewer females (26.1%) than males (35.0%) indicated their perceived BMI was lower than their ideal BMI (Table 3.6.8.3).

Significant differences were observed between those males whose perceived BMI was higher than their ideal BMI. In this case, there was an increasing trend by age, with the lowest perecentage (14.4%) observed in the younger (15–24 years of age) group compared with the other age groups. There were also significant differences among the participants who perceived their BMI to be lower than their ideal BMI, with a rate trend that decreased with an increase in age. In this case, the highest rate of perceiving that the BMI was lower than the ideal BMI (trend increasing with age) was observed in the younger group (15–24 years of age) (42.6%) compared with the older groups (range 24.3% to 34.0%). Similar age trends were observed in females, who perceived that their BMI as higher than the ideal BMI and perceived BMI being lower than the ideal BMI (trend drcreasing with age). For perceived BMI being higher than the ideal BMI, younger females (15–24 years of age) had the lowest percentage (26.4%) compared to the other age groups (range 30.4% to 42.6%). For perceiving BMI as lower than ideal BMI, younger females (15–24 years of age) had the highest percentage (30.1%) when compared with the other age groups (range 20.3% to 27.8%).

For males, there was no significant difference between localities between those whose perceived BMI equaled their ideal BMI. Conversely, females in rural formal areas had a significantly higher percentage (52.9%) than those in urban formal (38.7%) and those in rural informal settings (41.4%). In both sexes, the group whose perceived BMI was higher than their ideal BMI, urban formal areas 26.6% (males) and 39.3% (females) had a significantly higher rate than those in the other localities [range 13.5% to 19.6% (males) and 23.4% to 29.2% (females)]. Conversely, in both males and females in the group whose perceived BMI was lower than their ideal BMI, respondents in urban formal areas (30.4% and 21.9%, respectively) and rural formal (26.1% and 21.1%, respectively) had a significantly lower rate than those in rural informal areas (47.1% and 35.2% respectively) and urban informal areas (40.0% and 28.0%, respectively).

There were also significant differences between males and females in Mpumalanga (62.7% and 60.9%, respectively) whose perceived BMI was equal to their ideal BMI and in all other provinces, except Gauteng, 48.2% in males only, and both sexes in Northern Cape (47.2% for males and 46.9% for females). In males in the group whose perceived BMI was higher than their ideal BMI, Western Cape had a significantly higher percentage (34.2%) compared to all other provinces (range 11.2% to 22.1%), except Gauteng (23.4%). Females in Western Cape had a significantly higher percentage (44.5%) compared with all other provinces (range 20.5% to 40.3%). In males in the group whose perceived BMI was lower than their ideal BMI, there were significant differences between, Western Cape (28.6%) and four other provinces [Eastern Cape (48.9%), Free State (49.4%), North West (43.8%) and Limpopo (41.3%). Females in Western Cape had a significantly lower rate (16.3%) than females in all other provinces (range 22.0% to 35.0%), except Mpumalanga (18.7%).

For males there was no significant difference between race groups in those whose perceived BMI equaled their ideal BMI. However, for females, Indians had a significantly lower percentage (27.4%) compared to coloureds (42.6%) and black Africans (42.1%). For both males and females in the group whose perceived BMI was higher than their ideal BMI, black Africans (17.9% and 29.6%, respectively) had the lowest percentage compared to all other race groups (range 38.8% to 49.9%). In the group whose perceived BMI was lower than their ideal BMI, black African males had a significantly higher percentage (39%) than all other race groups except coloured males (31%), while black African females (28.3%) had a significantly higher percentage than other race groups except Indian females (22.7%).

Perceived BMI compared to actual BMI

Overall 32.4% of males' and 43.2% of females' perceived BMI was equal to their actual BMI and the differences were significant (Table 3.6.8.4). Significantly more males (37.3) perceived themselves to have a larger BMI than they actually had, compared with 20.8% of females.

There were no significant differences between age groups for those people whose perceived BMI were equal to their actual BMI. However, amongst both males and females, who perceived their BMI to be larger than their actual BMI, the percentage tended to decrease with increasing age in both sexes with the only significant difference occurring between males 15–24 years of age (41.2%) and 55–64 years of age (23.4%), and those females 15–24 years of age (32.7%) and those in all other age groups (less than 19%).

There were no significant differences between localities for those people whose perceived BMI was equal to their actual BMI. The only significant difference occurred amongst males in the urban formal (32.7%) and urban informal (49%) settings whose perceived BMI was higher than their actual BMI.

Table 3.6.8.3: Perceived compared with ideal BMI among all participants aged 15 years of age and older by sex, locality, province and race, South Africa 2012

Background characteristics	Male							Female						
	Perceived BMI equals Ideal BMI		Perceived BMI higher than Ideal BMI		Perceived BMI lower than Ideal BMI		Total	Perceived BMI equals Ideal BMI		Perceived BMI higher than Ideal BMI		Perceived BMI lower than Ideal BMI		Total
	%	95% CI	%	95% CI	%	95% CI	n	%	95% CI	%	95% CI	%	95% CI	n
Age														
15–24	43.0	[38.7–47.4]	14.4	[12.1–17.1]	42.6	[39.0–46.4]	1 946	43.4	[38.9–48.0]	26.4	[23.4–29.8]	30.1	[27.0–33.5]	2 260
25–34	45.2	[40.0–50.6]	20.8	[17.4–24.5]	34.0	[29.5–38.8]	1 237	41.8	[37.7–46.0]	30.4	[26.5–34.5]	27.8	[24.7–31.2]	1 714
35–44	42.9	[37.3–48.8]	23.1	[18.9–27.9]	34.0	[28.8–39.6]	947	40.1	[36.4–44.0]	35.6	[31.9–39.5]	24.2	[21.1–27.7]	1 508
45–54	39.8	[34.1–45.8]	31.2	[26.2–36.7]	28.9	[23.7–34.8]	876	39.4	[35.0–44.0]	39.5	[35.5–43.6]	21.1	[17.9–24.8]	1 329
55–64	41.6	[34.4–49.3]	34.1	[27.3–41.5]	24.3	[19.7–29.5]	704	37.2	[32.4–42.2]	42.6	[36.5–48.8]	20.3	[16.6–24.6]	997
65+	43.5	[36.2–51.0]	23.3	[16.3–32.3]	33.2	[27.1–39.9]	454	38.6	[32.7–44.9]	35.1	[28.7–42.1]	26.3	[21.5–31.8]	902
Locality														
Urban formal	43.0	[38.2–47.9]	26.6	[23.2–30.3]	30.4	[26.8–34.2]	3 332	38.7	[34.8–42.9]	39.3	[35.8–43.0]	21.9	[19.7–24.3]	4 656
Urban informal	41.8	[36.2–47.7]	18.2	[15.2–21.6]	40.0	[34.8–45.4]	757	42.8	[36.9–49.0]	29.2	[24.7–34.1]	28.0	[23.6–32.8]	1 135
Rural formal	54.3	[45.6–62.8]	19.6	[15.3–24.7]	26.1	[20.2–33.0]	839	52.9	[45.5–60.2]	25.5	[20.1–31.7]	21.6	[17.1–27.1]	1 008
Rural informal	39.4	[35.0–44.0]	13.5	[11.4–15.8]	47.1	[42.7–51.6]	1 243	41.4	[37.7–45.1]	23.4	[21.1–25.9]	35.2	[32.3–38.2]	1 915
Province														
Western Cape	37.2	[31.1–43.8]	34.2	[28.2–40.8]	28.6	[23.6–34.1]	878	39.1	[33.9–44.7]	44.5	[38.0–51.2]	16.3	[12.9–20.5]	1 201
Eastern Cape	29.6	[24.6–35.1]	21.5	[17.1–26.7]	48.9	[41.9–55.9]	683	31.0	[26.2–36.1]	34.1	[29.2–39.4]	35.0	[29.7–40.6]	918
Northern Cape	47.2	[32.1–62.9]	21.3	[16.4–27.3]	31.4	[17.9–49.1]	399	46.9	[40.2–53.8]	31.1	[24.6–38.5]	22.0	[16.0–29.4]	577
Free State	34.2	[28.2–40.7]	16.5	[9.8–26.2]	49.4	[42.0–56.8]	322	37.0	[32.4–41.9]	35.3	[28.8–42.4]	27.7	[21.9–34.2]	460
KwaZulu-Natal	44.4	[38.4–50.5]	22.1	[17.2–27.8]	33.6	[28.4–39.2]	1 042	34.7	[30.4–39.2]	40.3	[33.9–47.0]	25.0	[21.3–29.2]	1 423
North West	37.9	[31.2–45.0]	18.3	[14.4–23.0]	43.8	[37.7–50.2]	733	42.9	[36.9–49.1]	23.7	[19.7–28.2]	33.4	[28.9–38.3]	1 134
Gauteng	48.2	[40.9–55.6]	23.4	[18.8–28.8]	28.4	[23.2–34.3]	1 096	43.6	[36.8–50.6]	32.1	[27.3–37.3]	24.3	[20.7–28.3]	1 474
Mpumalanga	62.7	[53.7–70.8]	11.2	[8.3–15.0]	26.2	[19.8–33.7]	525	60.9	[53.3–67.9]	20.5	[15.8–26.2]	18.7	[14.8–23.2]	784
Limpopo	43.9	[37.3–50.7]	14.9	[11.8–18.5]	41.3	[34.5–48.4]	493	43.3	[38.0–48.7]	25.9	[21.3–31.0]	30.9	[26.4–35.7]	743
Race														
African	43.1	[39.3–46.9]	17.9	[15.9–20.1]	39.0	[35.9–42.2]	4 020	42.1	[39.1–45.2]	29.6	[27.3–32.0]	28.3	[26.3–30.3]	5 863
White	45.6	[36.9–54.6]	41.8	[32.6–51.7]	12.5	[7.9–19.2]	306	33.7	[27.3–40.8]	49.4	[40.5–58.3]	16.9	[11.8–23.6]	395
Coloured	41.8	[35.9–47.9]	27.3	[23.2–31.7]	31.0	[26.4–35.9]	1 233	42.6	[38.3–47.0]	38.8	[35.1–42.7]	18.6	[15.4–22.4]	1 741
Asian/Indian	35.9	[27.0–46.0]	46.8	[36.1–57.9]	17.2	[13.2–22.2]	580	27.4	[21.5–34.2]	49.9	[38.9–60.9]	22.7	[14.8–33.0]	693
Total	43.0	[39.9–46.2]	22.0	[19.9–24.2]	35.0	[32.4–37.7]	6 171	40.9	[38.3–43.5]	33.0	[30.8–35.3]	26.1	[24.4–27.8]	8 708

95% CI: 95% confidence interval

Table 3.6.8.4: Perceived BMI compared with actual BMI among all participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	Male							Female						
	Perceived BMI equals actual BMI		Perceived BMI higher than actual BMI		Perceived BMI lower than actual BMI		Total	Perceived BMI equals actual BMI		Perceived BMI higher than actual BMI		Perceived BMI lower than actual BMI		Total
	%	95% CI	%	95% CI	%	95% CI	n	%	95% CI	%	95% CI	%	95% CI	n
Age														
15–24	27.2	[22.8–32.1]	41.2	[35.9–46.7]	2.3	[1.3–4.0]	778	35.6	[31.9–39.4]	32.7	[29.2–36.4]	8.7	[6.4–11.6]	1 194
25–34	25.9	[20.4–32.2]	40.8	[33.3–48.7]	6.4	[4.1–9.8]	401	46.9	[41.9–51.9]	18.5	[15.3–22.2]	7.6	[5.6–10.3]	816
35–44	35.4	[27.1–44.8]	39.5	[31.9–47.6]	3.9	[2.0–7.4]	358	46.7	[40.9–52.5]	15.0	[12.2–18.4]	5.4	[3.8–7.5]	744
45–54	34.3	[26.5–43.0]	34.9	[27.1–43.5]	11.9	[7.2–18.9]	385	45.1	[40.2–50.0]	14.0	[10.5–18.5]	6.5	[4.3–9.7]	750
55–64	37.0	[29.1–45.5]	23.4	[17.9–29.9]	7.4	[4.6–11.8]	358	42.9	[37.0–49.0]	17.1	[13.2–21.9]	10.4	[7.6–14.1]	589
65+	39.5	[30.4–49.4]	31.3	[23.2–40.7]	20.2	[12.7–30.4]	266	42.0	[36.4–47.9]	15.4	[11.9–19.9]	8.0	[5.7–11.1]	555
Locality														
Urban formal	33.6	[28.9–38.6]	32.7	[28.2–37.5]	8.4	[5.9–11.6]	1 215	41.6	[37.7–45.5]	19.7	[16.9–22.9]	8.9	[7.2–10.8]	2 201
Urban informal	28.5	[22.3–35.5]	49.0	[41.6–56.5]	7.2	[4.0–12.8]	302	51.4	[44.5–58.2]	19.4	[15.8–23.6]	6.6	[4.7–9.2]	604
Rural formal	25.0	[20.8–29.7]	41.7	[34.0–49.8]	8.0	[4.4–14.1]	420	39.0	[33.5–44.9]	26.0	[22.0–30.5]	5.6	[4.1–7.5]	653
Rural informal	31.5	[26.8–36.7]	37.7	[33.0–42.6]	5.0	[3.5–7.1]	613	41.7	[38.2–45.3]	20.4	[17.9–23.2]	7.1	[5.6–9.0]	1 193
Province														
Western Cape	39.0	[32.8–45.6]	36.4	[30.0–43.3]	11.1	[6.6–18.2]	401	50.3	[44.4–56.1]	21.2	[17.5–25.4]	6.3	[4.5–8.7]	735
Eastern Cape	31.8	[24.6–40.0]	36.9	[30.5–43.7]	10.6	[5.7–18.9]	370	37.3	[32.4–42.5]	18.2	[14.3–22.9]	6.6	[5.2–8.5]	583
Northern Cape	20.3	[13.3–29.6]	47.5	[34.6–60.6]	1.0	[0.3–3.5]	152	37.1	[29.2–45.7]	27.5	[19.5–37.3]	4.7	[2.0–10.8]	280
Free State	40.5	[30.8–51.0]	33.5	[25.4–42.8]	6.2	[3.2–11.7]	229	42.5	[33.0–52.7]	21.9	[13.8–32.8]	7.8	[5.1–11.7]	363
KwaZulu-Natal	28.1	[20.6–37.0]	34.4	[25.4–44.6]	4.1	[2.3–7.2]	381	40.4	[33.4–47.7]	17.8	[13.3–23.5]	7.0	[4.7–10.2]	697
North West	24.2	[18.2–31.5]	44.0	[35.6–52.7]	5.3	[3.0–9.3]	264	44.5	[36.4–52.9]	22.3	[17.0–28.7]	8.1	[5.9–11.0]	551
Gauteng	29.2	[21.9–37.9]	33.1	[25.4–41.9]	7.8	[4.7–12.7]	280	41.0	[35.1–47.0]	18.6	[15.0–22.9]	11.0	[8.2–14.7]	550
Mpumalanga	28.3	[21.9–35.9]	43.7	[39.1–48.5]	5.8	[3.7–8.9]	278	40.9	[36.3–45.7]	23.7	[19.9–28.0]	7.2	[4.9–10.4]	502
Limpopo	37.0	[29.6–45.2]	36.0	[28.2–44.7]	6.3	[3.0–12.8]	195	47.9	[42.6–53.2]	24.6	[20.2–29.6]	7.0	[4.4–11.1]	390
Race														
African	32.5	[29.2–36.0]	37.5	[34.1–41.0]	6.5	[5.0–8.3]	1 744	42.6	[40.1–45.2]	20.2	[18.3–22.1]	8.5	[7.3–9.9]	3 281
White	37.4	[22.5–55.3]	30.5	[13.8–54.6]	21.8	[7.7–48.1]	66	58.4	[39.8–74.8]	13.1	[5.7–27.4]	0.6	[0.1–4.1]	75
Coloured	34.2	[28.7–40.2]	40.9	[35.4–46.7]	8.7	[4.6–15.8]	540	47.5	[42.6–52.6]	25.1	[21.8–28.8]	6.5	[4.9–8.8]	992
Asian/Indian	19.2	[7.0–42.6]	21.3	[8.2–45.1]	9.6	[3.4–24.4]	133	32.6	[14.1–58.9]	27.4	[13.6–47.4]	3.1	[1.1–8.3]	214
Total	32.4	[29.4–35.4]	37.3	[34.2–40.5]	7.3	[5.8–9.2]	2 499	43.2	[40.8–45.7]	20.8	[19.1–22.7]	7.9	[6.9–9.1]	4 575

95% CI: 95% confidence interval

Among males who perceived their BMI to be equal to their actual BMI, males in Western Cape had a significantly higher percentage (39%) than those in Northern Cape (20.3%) and North West (24.2%). Similarly, significant results were seen between Western Cape (11.1%) and Northern Cape (1%) among males who perceived that their BMI was lower than their actual BMI. The only significant difference in females occurred between Western Cape (50.3%) and Eastern Cape (37.3%) in the group whose perceived BMI equaled their actual BMI. No significant difference exists between race groups in all categories.

Discussion

The results of the current survey suggest that more than 60% of South Africans are happy about their body size status and this is supported by the low rates found among participants who had attempted to change (lose/gain) their weight. Males were especially happier than females, with younger South Africans happier than older South Africans. Race and locality differentiate body size happiness in that, black South Africans tend to be happier than white South Africans. Moreover, South Africans living in the rural areas such as in Northern Cape seem to be more satisfied with their body size compared to South Africans living in the urban areas (for example, Western Cape). Almost 90% of South Africans aspire to be bigger with fewer (especially black South Africans) wanting to be within the normal range of weight. It seems as if South Africans do not understand the term 'normal weight' since only a handful could identify the 'normal weight' silhouette from those shown to them. Black South Africans and males in particular, were worse off. Only South Africans in the urban formal settings (Western Cape, in particular) were better at identifying a 'normal weight'. This is a cause for concern since understanding of 'normal weight' is the key to the adoption of healthier weight (Silva, Markland, Minderico et al. 2008).

It is also very interesting that despite of the majority of South Africans saying they are happy about their body size, only 42% of South Africans selected desired (ideal) silhouettes that were equal to their perceived silhouettes. This is an indication that in actuality less than half of South Africans are satisfied with their body size status while the rest are dissatisfied, at least in relation to the recommended ideal. In the group of participants that was dissatisfied, the majority of males chose bigger ideal while women chose smaller ideal silhouettes. It would therefore appear that South African men aspire to be bigger while South African women want to be thinner. These results are corroborated by international studies that associate the concepts of weight gain, masculinity and what it means to be a man, with men, strongly linking masculinity with stereotypical ideals of male bodies (Drummond 2003; Grogan & Richards 2002). However, in this case it appears as if is masculinity may be mistaken for fatness by some South African men. Moreover, in women the issue becomes is equally interesting as women wanted to lose weight because thinness may have been associated with beauty (Bulik, Wade, Heath et al. 2001) and thus at potential risk of attempting to engage in less healthy ways of losing weight. This is a cause for concern because these different sex desires are also differentiated by age whereby when South Africans get older they tend to have a more distorted body image such that, older men tend to want to be fatter while older women want to be thinner.

These results stress that interventions to improve body image may be helpful adjuncts to halting obesity and improving self-esteem and the physical health of South Africans. Obese people who start weight gain/reduction programs in pursuit of the ideal physique must confront and come to terms with the fact that they need not go beyond what is called 'normal body size, which is the real biological limits for everyone. Establishing more realistic goals for everyone's weight/body is an important issue. The main goal in this research is to understand better the 'normal' (healthy body size) to help South Africans understand the concept of body image and recognise social and personal threats to their own body image development, stressing that body image is a subjective, psychological construct and that the physical appearance and body image can be independent. Persons with negative body image often attribute their life difficulties to their appearance; recovery may be facilitated if participants abandon the idea that they must look different to be happier, attributing negative reactions from others to prejudice rather than to defects in personal traits. Helping South Africans to identify healthy appearance is crucial in promoting health over South Africans' beliefs and prejudices.

3.7 Child health

3.7.1 Anthropometry

Nutrition is foundational to both individual and national development. In 2012, the World Health Assembly set nutrition targets for reduction of stunting, wasting, and **overweight**. The costs of inaction are enormous, viz. undernutrition, overweight and poor child development outcomes with long–lasting effects on human capital formation. As economies grow and the rate of population growth slows, the returns to improved cognitive performance and psychological functioning in the workforce will expand substantially. Benefits are expected to be greater where strategies integrate the promotion of nutrition and child development. Undernutrition is responsible for 45% of deaths of children younger than 5 years, amounting to more than 3 million deaths each year. The 165 million children with stunted growth in 2011 have compromised cognitive development and physical capabilities, making yet another generation less productive than they would have otherwise been. Additionally, overweight in adults, and increasingly in children, constitutes an emerging burden that is quickly establishing itself globally, affecting both poor and rich populations (Maternal and Child Nutrition Study Group 2013).

The field of anthropometry encompasses a variety of human body measurements, such as weight, height, and size, including skinfold thicknesses, and circumferences. Anthropometry provides the single most portable, universally applicable, inexpensive and non–invasive technique for assessing the size, proportions, and composition of the human body. It reflects both health and nutritional status and predicts performance, health and survival. As such, it is a valuable tool for guiding public health policy and clinical decisions (WHO 1995).

The body mass index (BMI) is a measure of nutritional status that combines weight with height data. The BMI has been considered to be the most appropriate and simple indicator by which weight–for–height can be related to health outcomes. SANHANES-1 will provide information on the current anthropomentric status of South African children; other anthropometric data are not presented in this report. The standard WHO methodological procedures were used in measuring all anthropometric indices (WHO 1995).

Results

Weight and height of 0–14-year-olds

The mean weight (kg) and height (cm) of participants aged 0 to 14 years by sex, age, locality, province and race, indicate that, overall, South African girls were significantly heavier than boys (27.2 vs 24.8kg) (Tables 3.7.1.1 and 3.7.1.2); they were also marginally taller than boys, but not significantly so (118.9 vs 117.5cm). Weight and height increased with age, with boys being heavier and taller until the age of five years, whereafter girls were heavier and taller.

Boys living in urban formal areas were significantly heavier than those living in rural informal areas. They were also taller than all the other race groups (Table 3.7.1.1). The same pattern applied to girls, although the differences were not significant (Table 3.7.1.2).

KwaZulu-Natal, followed by Gauteng, had the heaviest boys and the North West province the lightest boys. Gauteng and KwaZulu-Natal boys were the tallest, while Western Cape boys were the shortest – none of the results for height between the provinces were significant. The same pattern for girls' weight was seen among the provinces, with KwaZulu-Natal and Gauteng having the heaviest girls. The lightest and shortest girls, however, were in the Free State province. There were no significant differences in mean weight and height for girls between the provinces.

The low numbers of Indian and especially white children do not justify a between race groups. When these two race groups are excluded there was no significant difference between black African and coloured children with respect to mean weights and heights.

Table 3.7.1.1: Mean weight and height among male participants aged 0–14 years by age, locality, province and race, South Africa 2012

Background characteristics	Boys					
	Weight (kg)			Height (cm)		
	Mean	95% CI	Total (n)	Mean	95% CI	Total (n)
Age						
0–6 months	*	*	*	*	*	52
6–11 months	*	*	*	*	*	45
12–23 months	11.4	10.7–12.1	125	78.9	77.7–80.0	125
2–5 years	16.1	15.7–16.6	656	98.6	97.5–99.8	656
6–9 years	24.4	23.9–24.9	625	123.2	122.3–124.0	625
10–14 years	38.4	37.2–39.5	620	145.0	143.9–146.1	620
Locality						
Urban formal	26.1	24.6–27.6	830	119.7	116.6–122.9	830
Urban informal	24.7	22.6–26.8	311	115.6	111.5–119.7	311
Rural formal	23.9	22.9–24.9	622	116.5	114.4–118.6	622
Rural informal	22.7	21.6–23.9	360	114.4	112.0–116.7	360
Province						
Western Cape	23.7	22.2–25.3	318	113.6	110.4–116.8	318
Eastern Cape	24.9	23.5–26.3	291	117.6	115.1–120.1	291
Northern Cape	22.3	20.1–24.5	122	115.8	111.2–120.4	122
Free State	23.1	21.4–24.8	188	114.2	109.9–118.5	188
KwaZulu-Natal	26.4	24.1–28.6	302	119.8	115.2–124.3	302
North West	22.1	20.8–23.4	275	114.6	111.3–117.8	275
Gauteng	26.1	23.7–28.4	205	120.4	115.5–125.3	205
Mpumalanga	24.0	22.6–25.4	237	115.1	112.3–117.8	237
Limpopo	23.8	21.6–26.0	185	117.0	112.6–121.3	185

Race						
African	24.7	23.9–25.6	1629	117.4	115.7–119.2	1 629
White	*	*	*	*	*	10
Coloured	23.7	22.1–25.2	433	116.1	112.9–119.3	433
Asian/Indian	*	*	*	*	*	42
Total	24.8	24.0–25.6	2 123	117.5	115.9–119.2	2 123

95% CI: 95% confidence interval

Table 3.7.1.2 Mean weight and height among female participants aged 0–14 years by age, locality, province and race, South Africa 2012

Background characteristics	Girls					
	Weight (kg)			Height (cm)		
	Mean	95%CI	Total (n)	Mean	95%CI	Total (n)
Age						
0–6 months	*	*	56	*	*	56
6–11 months	*	*	57	*	*	57
12–23 months	10.7	10.2–11.2	125	76.3	74.6–78.0	125
2–5 years	15.7	15.3–16.1	640	98.0	97.0–99.0	640
6–9 years	25.4	24.6–26.3	592	123.9	122.8–125.0	592
10–14 years	44.5	43.0–45.9	685	148.2	147.4–149.0	685
Locality						
Urban formal	28.6	26.5–30.8	837	120.2	117.3–123.0	837
Urban informal	25.0	22.8–27.1	305	112.3	107.8–116.8	305
Rural formal	26.9	25.7–28.1	649	120.3	118.2–122.5	649
Rural informal	24.9	23.1–26.7	364	116.7	113.2–120.2	364
Province						
Western Cape	25.6	23.2–28.1	300	116.5	112.7–120.2	300
Eastern Cape	27.2	25.0–29.4	293	120.1	116.0–124.2	293
Northern Cape	27.2	24.2–30.3	135	122.4	115.4–129.4	135
Free State	24.6	20.9–29.2	194	111.0	105.9–116.2	194
KwaZulu-Natal	29.3	26.1–32.4	322	120.1	115.8–124.5	322
North West	24.7	21.9–27.4	280	115.9	110.5–121.3	280
Gauteng	28.6	26.0–31.2	195	120.4	116.1–124.7	195
Mpumalanga	26.3	24.2–28.5	246	119.9	115.8–124.1	246
Limpopo	25.6	23.9–27.3	190	118.6	115.9–121.3	190
Race						
African	27.0	25.9–28.1	1 681	118.5	116.7–120.2	1 681
White	*	*	10	*	*	10
Coloured	27.4	25.1–29.7	421	120.6	116.9–124.3	421
Asian/Indian	*	*	41	*	*	41
Total	27.2	26.2–28.2	2 155	118.9	117.3–120.5	2 155

95% CI: 95% confidence interval

Body mass index (BMI) and prevalence of overweight and obesity

In relation to the mean BMI and percentage of boys (Table 3.7.1.3) and girls (Table 3.7.1.4) aged 2–14 years, overall, South African boys had a mean BMI of 17.0kg/m^2, which was not significantly different than that of girls (17.7 kg/m^2). The prevalence of overweight and obesity was significantly higher in girls than boys (16.5 and 7.1% vs 11.5 and 4.7%, for girls and boys, respectively). The percentage of normal and underweight children was also significantly greater among boys than girls (83.8 vs 76.4%). Overall, mean BMI increased with age in boys and girls. Girls had higher prevalence rates than boys for overweight and for obesity at all ages. Between age group differences for overweight and normal/ underweight were significant for boys only.

Children from urban formal and informal areas had the highest mean BMIs, significantly higher than the rural informal which had the lowest mean BMI. Overweight and obesity was highest in urban formal and informal areas and lowest in the rural informal areas, for both sexes.

Table 3.7.1.3: Percentage of male participants aged 2–14 years by body mass index categories by age, locality, province and race, South Africa 2012

	Boys					
	Body mass index		BMI categories			
Background characteristics			Underweight and normal <24.9	Overweight 25–29.9	Obese 30+	Total
	Mean	95% CI	% (95% CI)	% (95% CI)	% (95% CI)	n
Age						
2–5 years	16.5	16.3–16.8	78.1 (71.9–84.4)	17.5 (11.4–23.6)	4.4 (2.2–6.5)	651
6–9 years	15.9	15.7–16.1	92.8 (90.2–95.4)	4.5 (2.7–7.2)	2.7 (0.7–4.8)	626
10–14 years	18.0	17.6–18.4	89.9 (86.2–93.5)	7.5 (5.0–9.9)	2.7 (0.8–4.6)	628
Locality						
Urban formal	17.2	16.8–17.6	82.8 (76.9–88.8)	11.8 (7.5–16.2)	5.4 (2.9–7.8)	830
Urban informal	17.5	17.0–17.9	74.8 (65.9–83.7)	20.0 (11.0–29.0)	5.2 (1.5–8.9)	311
Rural formal	16.7	16.5–16.9	86.9 (84.1–89.7)	8.9 (6.8–10.9)	4.2 (2.5–6.0)	622
Rural informal	16.4	16.1–16.7	88.5 (85.5–91.5)	9.0 (5.8–12.2)	2.5 (1.0–4.0)	360
Province						
Western Cape	17.3	16.7–17.9	77.8 (69.9–85.6)	18.2 (10.1–26.2)	4.1 (1.7–6.5)	318
Eastern Cape	17.1	16.8–17.4	83.9 (78.8–89.0)	12.4 (8.5–16.4)	3.7 (1.0–6.4)	291
Northern Cape	15.7	15.0–16.5	93.2 (88.7–97.7)	2.9 (0.3–5.5)	3.9 (1.1–6.8)	122
Free State	16.8	16.5–17.1	85.1 (78.9–91.3)	10.8 (4.6–17.0)	4.1 (1.5–6.8)	188
KwaZulu-Natal	17.3	16.9–17.8	78.9 (72.2–85.3)	15.1 (9.0–21.2)	6.1 (2.6–9.6)	302
North West	16.1	15.7–16.4	90.9 (86.8–95.1)	6.4 (2.8–10.0)	2.7 (0.5–4.8)	275
Gauteng	17.2	16.6–17.8	83.7 (73.3–94.0)	11.0 (4.0–18.0)	5.3 (1.2–9.4)	205
Mpumalanga	17.0	16.6–17.4	83.4 (79.7–87.1)	10.6 (6.4–14.8)	6.1 (3.2–8.9)	237
Limpopo	16.3	15.9–16.8)	91.9 (87.1–96.7)	4.8 (1.9–7.7)	3.3 (0.4–6.1)	185
Race						
African	17.0	16.8–17.2	83.3 (80.0–86.6)	11.9 (9.3–14.5)	4.8 (3.3–6.3)	1 629
White	*	*	*	*	*	10
Coloured	16.5	16.2–16.8	88.2 (84.4–92.1)	8.0 (4.9–11.2)	3.8 (1.8–5.8)	433
Asian/Indian	*	*	*	*	*	42
Total	17.0	16.8–17.2	83.8 (80.8–86.7)	11.5 (9.2–13.9)	4.7 (3.4–6.0)	2 123

BMI cut points using Cole classification

95% CI: 95% confidence interval

** Too few observations to report reliably*

Among boys, the Western Cape, KwaZulu-Natal, Gauteng, and the Eastern Cape provinces had the highest BMI (17.3, 17.3, 17.2, and 17.1 kg/m^2) while Northern Cape and North West had the lowest and second lowest, respectively (15.7 and 16.1 kg/m^2). The differences were significant. Overweight was most prevalent in the Western Cape, KwaZulu-Natal, Eastern Cape, and Gauteng (18.2, 15.1, 12.4, and 11%), and least prevalent in the Northern Cape, Limpopo, and North West (2.9, 4.8, and 6.4%). Mpumalanga, KwaZulu-Natal, and Gauteng had the most obesity (6.1, 6.1, and 5.3%) while North West, Limpopo, and Eastern Cape had the least (2.7, 3.3, and 3.7%).

Girls from KwaZulu-Natal, Gauteng, Free Sate, and the Eastern Cape had the highest mean BMI (18.5, 18.2, 17.7, and 17.5 kg/m^2), and Limpopo and North West the lowest (16.8 and 16.9 kg/m^2). There was no significant difference in mean BMI between the provinces. KwaZulu-Natal, Gauteng, and Western Cape girls were most overweight (20.3, 20.3, and 19.1%) and those from Northern Cape and Limpopo the least (8.3 and 9.1%; both significantly lower than KwaZulu-Natal). Obesity was highest in Gauteng, KwaZulu-Natal,

Table 3.7.1.4: Percentage of female participants aged 2–14 years by body mass index categories by age, locality, province and race, South Africa 2012

Background characteristics	Girls					
	Body mass index		BMI categories			
			Underweight and normal <24.9	Overweight 25 –29.9	Obese 30+	Total
	Mean	SD	% (95% CI)	% (95% CI)	% (95% CI)	n
Age						
2–5 years	16.3	16.1–16.6	76.2 (71.1–81.2)	18.9 (14.1–23.7)	4.9 (2.9–7.0)	640
6–9 years	16.4	16.0–16.7	83.6 (79.1–88.2)	12.3 (8.8–15.7)	4.1 (0.8–7.4)	594
10–14 years	19.9	19.3–20.4	77.7 (73.3–82.1)	16.7 (12.4–20.9)	5.6 (3.0–8.2)	691
Locality						
Urban formal	18.1	17.5–18.7	71.6 (66.0–77.3)	19.4 (14.7–24.1)	8.9 (5.1–12.8)	837
Urban informal	18.0	17.6–18.5	70.0 (63.1–76.8)	20.8 (15.7–25.8)	9.3 (4.5–14.0)	305
Rural formal	17.3	17.0–17.6	82.5 (80.0–85.2)	13.1 (10.6–15.6)	4.4 (2.7–6.1)	649
Rural informal	17.0	16.6–17.4	83.0 (77.9–88.0)	10.7 (6.9–14.5)	6.3 (3.5–9.2)	364
Province						
Western Cape	17.3	16.8–17.9	73.7 (66.8–80.6)	19.1 (12.9–25.3)	7.2 (4.2–10.3)	300
Eastern Cape	17.5	17.1–17.9	80.9 (76.5–85.3)	12.4 (8.3–16.5)	6.7 (3.2–10.2)	293
Northern Cape	17.0	16.3–17.6	88.3 (80.5–96.1)	8.3 (2.2–14.4)	3.5 (0.2–6.7)	135
Free State	17.7	16.8–18.5	77.6 (70.9–84.4)	17.7 (11.4–24.0)	4.7 (0.5–8.8)	194
KwaZulu–Natal	18.5	17.6–19.3	71.1 (64.9–77.4)	20.3 (15.8–24.8)	8.5 (3.3–13.7)	322
North West	16.9	16.4–17.4	80.5 (72.6–88.5)	15.2 (7.4–23.0)	4.3 (1.4–7.1)	280
Gauteng	18.2	17.4–19.0	69.7 (59.5–79.9)	20.3 (12.0–28.6)	10.0 (3.7–16.4)	195
Mpumalanga	17.1	16.8–17.5	80.3 (75.5–85.2)	14.1 (9.5–18.8)	5.5 (3.2–7.8)	246
Limpopo	16.8	16.3–17.3	86.6 (81.7–91.5)	9.1 (4.7–13.6)	4.3 (1.3–7.2)	190
Race						
African	17.7	17.4–18.0	76.4 (73.5–79.4)	16.2 (13.9–18.6)	7.3 (5.3–9.4)	1681
White	*	*	*	*	*	10
Coloured	17.3	16.7–17.8	80.1(74.1–86.2)	14.6 (9.1–20.0)	5.3 (2.6–8.0)	421
Asian/Indian	*	*	*	*	*	41
Total	17.7	17.4–18.0	76.4 (73.6–79.2)	16.5 (14.3–18.8)	7.1 (5.2–8.9)	2 155

BMI cut points using Cole classification
95% CI: 95% confidence interval
** Too few observations to report reliably*

and Western Cape (10.0, 8.5, and 7.2%) and lowest in the Northern Cape, North West, and Limpopo (3.5, 4.3, and 4.3%).

The small numbers of white children (20 and 83, respectively) make comparisons between groups impractical. There were no significant differences between the black African and coloured race groups. Black African girls had a significantly higher mean BMI when compared black African boys.

Undernutrition in children 0–14 years of age

For all children, the prevalence of stunting was 15.4%, of severe stunting 3.8%, of wasting and severe wasting 2.9 and 0.8%, respectively, and of underweight and severe underweight 5.8 and 1.1%.

Mean Z–scores for height-for-age (HAZ), BMI-for-age (BAZ), and weight-for-age (WAZ) were significantly different between boys (Table 3.7.1.5) and girls (Table 3.7.1.6). Boys were more stunted (HAZ <–2 SD), wasted/thinner (BAZ < –2 SD), and underweight (WAZ < –2 SD) than girls (respectively, 16.7, 3.8, and 7.4% vs 13.7, 1.7, and 3.6%). Except for stunting, the differences were significant. The same pattern prevailed in the case of severe undernutrition (HAZ, BAZ, and WAZ < –3 SD); however, only severe wasting was significantly different by sex.

The youngest boys and girls (0–3 years of age) had the highest prevalence of stunting (26.9 and 25.9%), which was significantly different from the other age groups, with the lowest prevalence in the 7–9-year-old age group (10 and 8.7% for boys and girls, respectivvely). Wasting, however, was highest in the 10–14-year-old group for boys and girls (5.6 and 2.5%), and lowest in 7–9-year-old boys (2.4%) and 4–6-year-old girls (1.0%). Underweight among boys and girls was most prevalent in the 7–9-year-old age group (8.6 and 4.0%) and least prevalent in 10–14 year old boys (0%) and the 4–6-year-old girls (3.2%). The combined, by age group, prevalence according to age groups 0–3 years, 4–6 years, and 7–9 years was 26.5%, 11.9%, and 9.4% for stunting, wasting and underweight, respectively. The differences between the age groups described for girls and boys also applied to the combined results.

Among boys, rural informal areas had significantly more stunting (23.2%) than urban formal areas (13.6%), which had the lowest prevalence. Wasting (9.3%) and underweight (14.0%) were also significantly higher in the rural informal areas, but the lowest prevalence was in the urban informal areas (1.0 and 3.2%). Girls living in urban informal areas had the highest prevalence of stunting (20.9%) and those in urban formal areas, the lowest (10.4%), the difference in prevalence being significant. Wasting (3.4%) and underweight (9.2%) were most prevalent in rural informal areas and least prevalent in urban informal (0.6%) and rural formal (2.8%), respectively. There were no significant differences in wasting between the areas of residence; underweight prevalence differed significantly except for the urban informal area. Overall, the rural informal locality had the highest prevalence of undernutrition, with 20.6, 6.8 and 12.1%, stunting, wasting and underweight, respectively.

Boys living in North West, Mpumalanga, and Northern Cape provinces had the highest stunting prevalence (23.7, 23.1, and 22.8%, respectively) and those from Gauteng the lowest (11.9%). Stunting prevalence in Gauteng was significantly lower than in North West. The Northern Cape and North West had the highest wasting (18.5 and 8.5%) and underweight (23.8 and 15.2%) prevalence, while the Eastern Cape (1.6 and 1.9) and Free State (1.7 and 2.2%) had the lowest. The difference in wasting and underweight between

Table 3.7.1.5: Percentage of male participants under fifteen years of age classified as malnourished according to three anthropometric indices of nutritional status: height-for-age, weight-for-height, and weight-for-age, by age, locality, province and race, South Africa 2012

Background characteristic	Boys								
	Height-for-age (stunting)			Weight-for-height (wasting) (BAZ)			Weight-for-age (underweight)		
	Below –2 SD	Below –3 SD	Total	Below –2 SD	Below –3 SD	Total	Below –2 SD	Below –3 SD	Total
	% (95% CI)	% (95% CI)	n	% (95% CI)	% (95% CI)	n	% (95% CI)	% (95% CI)	n
Age									
0–3 years	26.9 [21.9–32.0]	9.9 [6.4–13.4]	537	3.8 [1.6–5.9]	1.9 [0.2–3.7]	537	8.2 [4.8–11.6]	2.6 [0.3–4.9]	537
4–6 years	13.5 [9.6–1 7.5]	2.6 [1.3–3.8]	503	2.6 [0.9–4.4]	1.0 [0.0–2.2]	503	5.4 [3.3–7.6]	0.9 [0.2–1.6]	503
7–9 years	10.0 [6.3–13.6]	1.5 [0.0–3.2]	463	2.4 [0.7–4.1]	0.8 [0.0–1.6]	463	8.6 [5.4–11.8]	0.7 [0.0–1.3]	463
10–14 years	15.2 [11.3–19.1]	1.8 [0.8–2.7]	620	5.6 [3.2–8.0]	0.5 [0.0–1.0]	620			620
Locality									
Urban formal	13.6 [9.6–17.6]	3.1 [1.5–4.6]	830	4.3 [2.4–6.2]	1.3 [0.2–2.4]	830	7.8 [4.8–10.8]	1.7 [0.0–3.7]	830
Urban informal	17.0 [12.1–21.8]	3.5 [0.9–6.2]	311	1.0 [0.1–1.9]	0.5 [0.0–1.1]	311	3.2 [0.6–5.8]	0.3 [0.0–0.9]	311
Rural formal	18.4 [14.8–22.1]	4.3 [2.4–6.2]	622	2.9 [1.3–4.5]	0.1 [0.0–0.3]	622	6.9 [3.9–10.0]	0.9 [0.1–1.7]	622
Rural informal	23.2 [18.7–27.8]	7.1 [3.8–10.3]	360	9.3 [5.0–13.7]	4.4 [0.6–8.1]	360	14.0 [8.5–19.5]	4.1 [1.0–7.1]	360
Province									
Western Cape	17.5 [11.5–23.6]	3.8 [1.0–6.6]	318	2.0 [0.4–3.5]	0.1 [0.0–0.4]	318	7.2 [3.9–10.5]	1.0 [0.0–2.2]	318
Eastern Cape	21.6 [15.4–27.8]	4.0 [0.7–7.3]	291	1.6 [0.1–3.1]	0.2 [0.0–0.5]	291	1.9 [0.1–3.6]	0.1 [0.0–0.4]	291
Northern Cape	22.8 [12.8–32.8]	8.7 [1.4–16.1]	122	18.5 [4.8–32.1]	12.9 [0.0–26.5]	122	23.8 [5.7–42.0]	8.8 [0.0–18.3]	122
Free State	19.4 [13.4–25.5]	3.2 [0.6–5.9]	188	1.7 [0.1–3.3]	0.5 [0.0–1.3]	188	2.2 [0.0–4.6]	0.4 [0.0–1.3]	188
KwaZulu–Natal	13.5 [8.4–18.5]	1.8 [0.3–3.3]	302	2.4 [0.0–5.3]	0.1 [0.0–0.2]	302	3.4 [0.5–6.4]	0.5 [0.0–1.3]	302
orth West	23.7 [18.8–28.6]	9.7 [5.7–13.6]	275	8.5 [3.5–13.4]	2.2 [0.3–4.0]	275	15.2 [9.4–21.1]	2.7 [0.0–5.5]	275
Gauteng	11.9 [5.5–18.3]	2.9 [0.2–5.6]	205	3.6 [1.0–6.1]	1.9 [0.0–4.1]	205	8.7 [3.8–13.7]	2.5 [0.0–6.1]	205
Mpumalanga	23.1 [16.6–29.6]	7.3 [2.3–12.3]	237	2.8 [0.9–4.7]	1.2 [0.0–2.6]	237	10.4 [5.1–15.6]	1.7 [0.0–4.0]	237
Limpopo	13.7 [7.2–20.2]	3.0 [0.2–5.8]	185	6.5 [2.4–10.7]		185	9.1 [1.8–16.4]	0.7 [0.0–2.1]	185
Race									
African	16.7 [14.1–19.2]	3.9 [2.7–5.0]	1 629	3.8 [2.6–5.0]	1.0 [0.4–1.7]	1 629	6.8 [4.8–8.7]	1.3 [0.3–2.3]	1 629
White	*	*	10	*	*	10	*	*	10
Coloured	18.6 [14.5–22.7]	4.5 [2.5–6.5]	433	4.5 [2.3–6.8]	1.1 [0.2–1.9]	433	11.5 [8.3–14.7]	2.2 [0.6–3.9]	433
Asian/Indian	*	*	42	*	*	42	*	*	42
Total	16.7 [14.4–18.9]	3.9 [2.9–5.0]	2 123	3.8 [2.7–4.9]	1.0 [0.4–1.6]	2 123	7.4 [5.6–9.1]	1.4 [0.6–2.3]	2 123

*95% CI: 95% confidence interval * Too few observations to report reliably*

Table 3.7.1.6: Percentage of female participants under fifteen years of age classified as malnourished according to three anthropometric indices of nutritional status: height-for-age, weight-for-height, and weight-for-age, by age, locality, province and race, South Africa 2012

Background characteristics	Girls								
	Height-for-age (stunting)			Weight-for-height (wasting) (BAZ)			Weight-for-age (underweight)		
	Below –2 SD	Below –3 SD	Total	Below –2 SD	Below –3 SD	Total	Below –2 SD	Below –3 SD	Total
	% [95%CI]	% [95%CI]	n	% [95%CI]	% [95%CI]	n	% [95%CI]	% [95%CI]	n
Age									
0–3 years	25.9 [20.8–31.1]	9.1 [5.6–12.6]	553	1.5 [0.3–2.7]	0.3 [0.0–0.8]	553	3.6 [1.9–5.3]	0.7 [0.1–1.3]	553
4–6 years	9.5 [6.2–12.8]	1.6 [0.4–2.8]	451	1.0 [0.2–1.8]	0.6 [0.0–1.2]	451	3.2 [1.5–4.9]	0.2 [0.0–0.4]	451
7 – 9 years	8.7 [5.7–11.6]	1.9 [0.6–3.2]	466	1.2 [0.2–2.1]	0.1 [0.0–0.3]	466	4.0 [2.1–5.9]	1.2 [0.4–2.0]	466
10–14 years	10.1 [7.4–12.8]	1.7 [0.7–2.8]	685	2.5 [1.4–3.6]	0.9 [0.2–1.7]	685	3.2 [0.0–9.5]	3.2 [0.0–9.5]	685
Locality									
Urban formal	10.4 [7.3–13.4]	3.2 [1.3–5.1]	837	1.8 [0.9–2.6]	0.5 [0.0–1.0]	837	2.9 [1.5–4.3]	0.7 [0.1–1.2]	837
Urban informal	20.9 [14.4–27.4]	4.5 [0.8–8.2]	305	0.6 [0.0–1.4]		305	4.1 [0.9–7.3]		305
Rural formal	13.9 [10.9–17.0]	3.1 [1.7–4.5]	649	1.5 [0.4–2.7]	0.6 [0.0–1.3]	649	2.8 [1.1–4.4]	0.5 [0.0–1.0]	649
Rural informal	17.0 [12.5–21.4]	6.2 [3.4–9.1]	364	3.4 [1.2–5.6]	1.1 [0.1–2.1]	364	9.2 [4.8–13.7]	3.3 [1.1–5.5]	364
Province									
Western Cape	13.9 [9.4–18.4]	3.0 [1.0–5.0]	300	1.3 [0.1–2.5]	0.6 [0.0–1.5]	300	4.6 [1.6–7.7]	1.1 [0.0–2.4]	300
Eastern Cape	15.6 [9.4–21.8]	4.0 [1.2–6.8]	293	3.2 [1.1–5.3]	1.1 [0.0–2.3]	293	5.6 [2.0–9.1]	0.6 [0.0–1.2]	293
Northern Cape	15.0 [7.1–22.9]	3.9 [0.2–7.5]	135	5.1 [1.0–9.2]	2.4 [0.1–4.6]	135	10.8 [4.6–17.0]	4.4 [0.0–9.0]	135
Free State	22.1 [13.0–31.2]	6.5 [2.0–11.1]	194	1.4 [0.0–3.2]		194	6.9 [0.5–13.4]	0.1 [0.0–0.3]	194
KwaZulu–Natal	14.4 [9.9–19.0]	1.2 [0.0–2.4]	322			322	1.5 [0.0–3.1]		322
North West	17.8 [12.0–23.6]	6.5 [3.6–9.5]	280	5.2 [2.5–7.8]	1.1 [0.0–2.3]	280	7.9 [3.8–11.9]	3.1 [0.5–5.7]	280
Gauteng	10.0 [4.6–15.5]	5.1 [0.8–9.4]	195	0.4 [0.0–0.9]		195	1.2 [0.0–3.0]	0.1 [0.0–0.3]	195
Mpumalanga	13.0 [8.1–17.9]	4.2 [1.7–6.6]	246	1.8 [0.0–3.8]	0.8 [0.0–2.2]	246	3.7 [1.1–6.3]	2.3 [0.0–4.7]	246
impopo	9.4 [4.8–14.1]	2.3 [0.0–4.5]	190	2.8 [0.0–6.0]	1.2 [0.0–2.8]	190	2.4 [0.0–5.8]	–	190
Race									
African	13.6 [11.3–15.8]	3.5 [2.3–4.7]	1 681	1.4 [0.8–2.0]	0.4 [0.1–0.7]	1 681	3.0 [2.0–4.0]	0.5 [0.2–0.9]	1 681
White	*	*	10	*	*	10	*	*	10
Coloured	16.1 [11.6–20.5]	5.1 [2.8–7.5]	421	4.2 [2.2–6.2]	2.0 [0.5–3.5]	421	9.8 [5.8–13.8]	2.8 [0.9–4.7]	421
Asian/Indian	*	*	41	*	*	41	*	*	41
Total	13.7 [11.6–15.7]	3.6 [2.5–4.7]	2 155	1.7 [1.1–2.3]	0.5 [0.2–0.9]	2 155	3.6 [2.6–4.6]	0.7 [0.4–1.1]	2 155

these provinces was significant. Girls in the Free State, North West, and the Eastern Cape were most stunted (22.1, 17.8, and 15.6%); the least stunted were recorded in Limpopo (9.4%). There was no significant difference between the provinces regarding stunting. The Northern Cape and North West again had the highest wasting and underweight prevalence (5.1 and 5.2% for wasting, and 10.8 and 7.9% for underweight, respectively). Gauteng and KwaZulu-Natal had the lowest wasting and underweight; in both instances, this was significantly lower than the Northern Cape and North West provincial prevalence.

Among the race groups, coloured children (boys and girls) were most stunted (18.6 and 16.1%) and wasted (4.5 and 4.2%), and coloured girls most underweight (9.8%). Coloured girls were significantly more stunted, wasted and underweight than black African girls.

Discussion

Although there is agreement on the importance of using a standard recommendation to determine obesity risk in the general childhood population, definitions of overweight and obesity, as well as age groups, often differ across studies, making comparisons of prevalence data difficult (De Onis & Lobstein 2010).

The anthropometric data on children under 14 years of age in the first SANHANES-1 survey essentially refer to African and coloured children, as there were very few white and Indian children in the sample. Nonetheless, the data are nationally representative and allow for comparison with the NFCS–2005 (Labadarios 2007) for many indicators, as well as with regional and international survey information.

Overweight and obesity (overnutrition)

SANHANES-1 2–5-year-olds were compared to NFCS–2005 age groups 1–3 years and 4–6 years for mean BMI, overweight, and obesity comparisons. SANHANES-1 results are given first, then NFCS–2005: Mean BMI was slightly higher, 16.4 vs 16 kg/m^2 and the proportion of children who were underweight and normal was much lower in the SANHANES-1 children (77.2% vs 84.9%). The prevalence of overweight, on the other hand, was higher (18.2 vs 10.6%) and that of obesity about the same between the two groups (4.7 vs 4.5%).

Among 6–9-year-olds, mean BMI was 16.2 and 16 kg/m^2 for SANHANES-1 and NFCS–2005 children, respectively. There were 88.2% and 89.8% of the children who were underweight or of normal weight based on BMI cut-offs. Overweight prevalence was 8.4 vs 7.8% and obesity 3.4 vs 2.5%.

The 2008 Youth Risk Behaviour Survey (Reddy 2010) of school–going children in South Africa documented an overall overweight prevalence of 19.2 and 16.8% for 13 and 14-year-olds, respectively. For obesity the respective prevalence was 3.5 and 5.5%. The SANHANES-1 10–14-year-olds had prevalence rates of 12.1 and 4.2%. The Health of the Nation Study was conducted between 2001 and 2004 among white, African, and Coloured 6–13-year-olds in five provinces of South Africa (Armstrong 2006). When the SANHANES-1 results for 6–14-year-olds were compared with the 2006 study of 6–13-year-olds (white children excluded), a clear pattern emerged. Overall, SANHANES-1 overweight and obesity prevalence was higher, especially among black African children, and coloured girls. For overweight, the respective prevalences for black African boys and girls (combined) in SANHANES-1 and the 2006 Study, were 11.9% vs 7.6%, and 16.2% vs 12.3%; for coloured boys and girls the prevalence was 8.0% vs 8.7%, and 14.6% vs 10.7%. Obesity values were, respectively, for black Africans 4.8% vs 2.1%, and 7.3% vs 4.7%; and for coloured boys and girls, 3.8% vs 3%, and 5.3% vs 4.8%.

The worldwide prevalence of early childhood overweight and obesity increased from 4.2% in 1990 to 6.7% in 2010 (De Onis 2010a). Of the 111 countries with trend data, 53 showed a rising trend. Regional and international comparisons show that South Africa's preschool–aged children have a major problem of overweight and obesity (combined). Morocco, Swaziland, Botswana, and Nigeria have a prevalence of 11%, which is about half of South Africa's prevalence, 22.9% (United Nations Children's Fund 2013). By further comparison, 12% of children aged 2–5 years were overweight and obese in the United States (Ogden 2012). The current prevalence in South Africa is where the USA was in 1999–2000, viz. 20.5% for 2–5-year-olds (Ogden 2002). Albania, Libya, Egypt, and Georgia reported overweight and obesity (combined) prevalence of of 23, 22, 21, and 20%, respectively (United Nations Children's Fund 2013).

Among school–aged children, the calculated global prevalence is 10%, varying from 5.7% in Pakistan to over 40% in Mexico (Gupta 2012). The current survey had a combined overweight and obesity prevalence of 14.2% for South African children aged 6–14 years. In the USA, the prevalence of overweight (including obesity) in 6–11-year-olds was 15.7% in 2009–2010 and 30.3% in 1999–2000 (Ogden 2012 and 2002).

Undernutrition

The results indicate that boys were more stunted, wasted (thinner) and underweight than girls, with highest stunting in the youngest age group (0–3 years). In terms of locality, undernutrition was most prevalent in rural informal areas. The North West, Free State and Northern Cape featured prominently with a high prevalence, while Gauteng and KwaZulu-Natal were among the provinces with the lowest prevalence. When the results for the white and Indian groups were excluded based on the low sample numbers, the Coloured children had the highest prevalence of undernutrition when compared with the black African children aged less than 14 years.

The results of the three age groups in the current survey (1–3, 4–6, and 7–9 years) were compared with the NFCS–2005 age groups 1–3, 4–6, and 7–9 years. The comparison shows that:

Among all age groups, the prevalence of undernutrition among children younger than 10 years of age has decreased in South Africa, proportionately more for wasting and underweight. The exception is the prevalence of stunting among tbe 1–3–year-old age group, which showed an increase of 11.7%. Severe stunting in this age group, however, increased by almost a third (32.6%). The trends are illustrated in the figure (Figures 3.7.1.1, 3.7.1.2, 3.7.1.3). For 4–6-and 7–9-year-olds, the respective decrease in stunting, wasting, and underweight was 27.4%, 60%, 47.7%, and 21.7%, 36.7%, and 13.2% .

In order to compare the SANHANES-1 results with regional and global data, the prevalence of stunting, wasting and underweight was calculated for children under five years with a respective prevalence of 21.5%, 2.6%, and 5.2%. Compared to the previous national survey in 2005 (Labadarios 2007), there has been a slight increase in stunting, but a clear decrease in wasting and underweight among children under five years in South Africa. In the global context, the prevalence level may be classified as of medium severity for stunting, and low for wasting and underweight (WHO 1995). The global prevalence for stunting decreased from an estimated 40% in 1990 to 25.7% in 2011 (UNICEF, WHO, World Bank 2012). For Africa, the latest stunting prevalence is 35.6% and 32.9% for the Africa Southern Region (De Onis 2012). Underweight and stunting prevalence is usually highly correlated. However, for south and central America, stunting prevalences remain substantial (15%) while the underweight prevalence is only 4% (UNSCN 2010). The current SANHANES-1 results appear to mimic the Latin America results with more stunting than underweight and wasting. Disaggregation of the results at provincial level, however, reveals that certain provinces still have high wasting and underweight prevalence rates, for example, North West, Free State and Northern Cape. Interestingly, among provinces, in Gauteng and KwaZulu-Natal the lowest prevalence rates for undernutrition appear to coexist with the highest prevalence of obesity.

Figure 3.7.1.1: Undernutrition in 1–3-year-olds

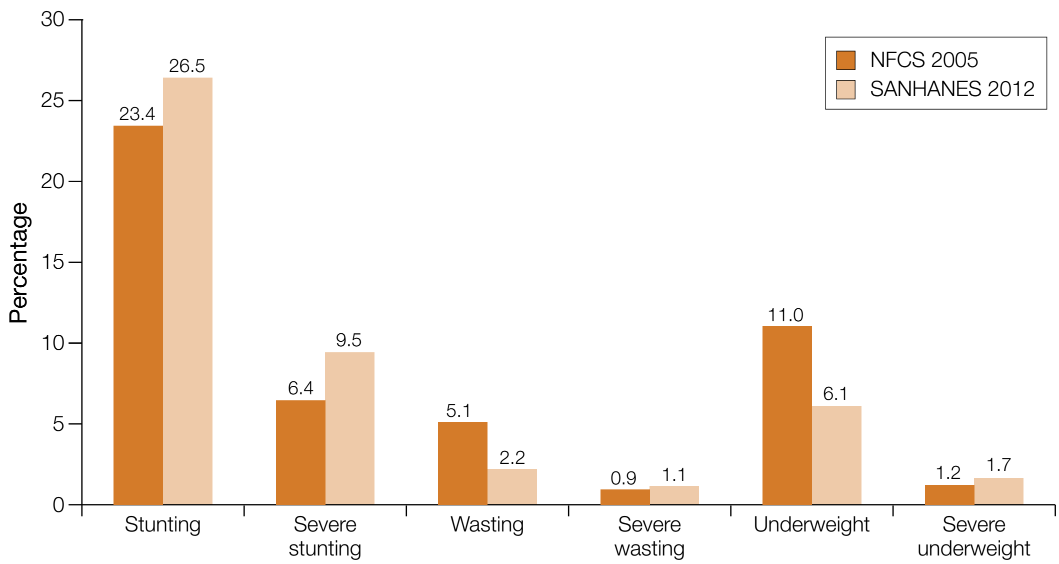


Figure 3.7.1.2: Undernutrition in 4–6-year-olds

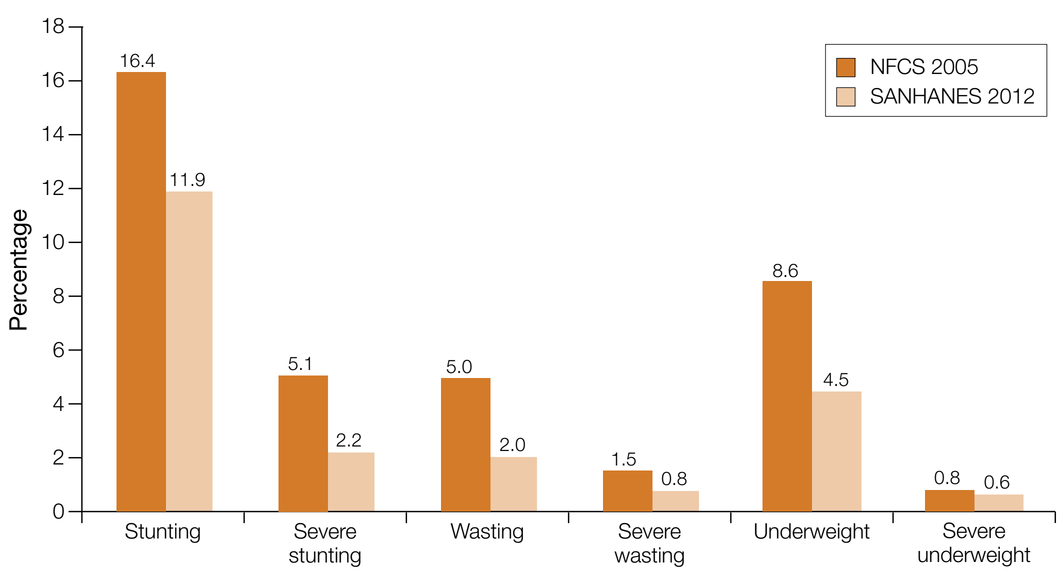
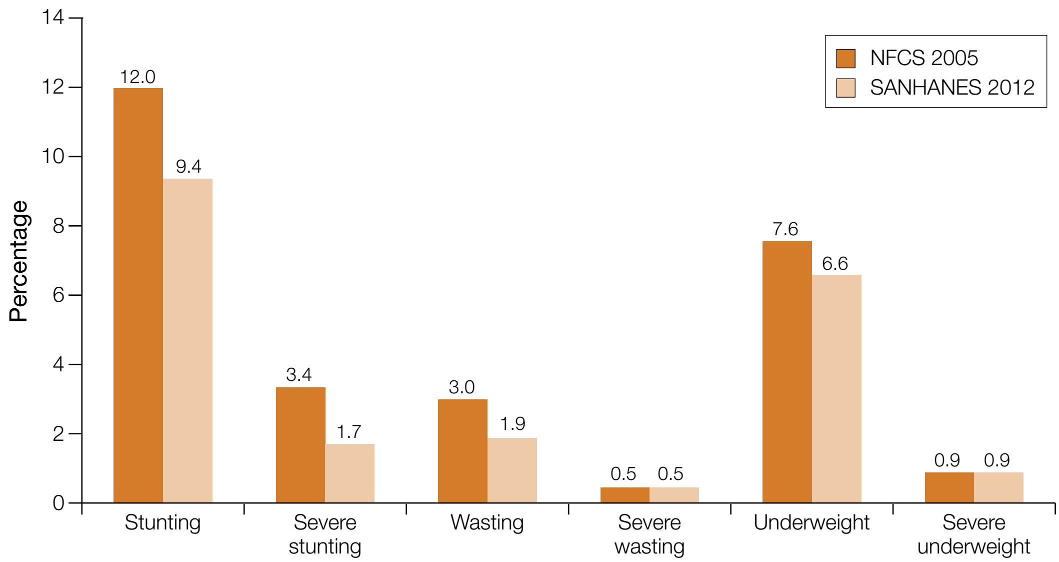


Figure 3.7.1.3: Undernutrition in 7–9-year-olds



Conclusion

The policy implications of the SANHANES-1 results are evident, nutrition–specific and nutrition–sensitive interventions (Ruel 2013) are needed to address the dual problems of chronic undernutrition (stunting) and the rapidly rising trend of overweight and obesity among children in South Africa. Attention should be given to care during and even before pregnancy, as well as during the important 'window of opportunity' up to around two years of age (de Onis 2011). The government's National Development Plan proposes to introduce a nutrition programme for pregnant women and young children, which the findings of the SANHANES-1 clearly supports (National Planning Commission 2012). Investing in nutrition of the population will lead to long–term benefits for the country.

3.8 Nutritional status of children

3.8.1 Vitamin A status of children under five years of age

Vitamin A deficiency (VAD) is an endemic nutritional disorder throughout much of the developing world, especially affecting the health and survival of infants, young children, and pregnant and lactating women. These age and life–stage groups represent periods when both nutrition stress is high and diet likely to be chronically deficient in vitamin A (West 2003). Women of reproductive age are also prone to vitamin and mineral deficiencies and may provide insight into the magnitude of micronutrient deficiencies among newborns. It has been reported that approximately 190 million preschool–aged children and are vitamin A deficient (WHO 2009). Health consequences of vitamin A deficiency include mild to severe systemic effects on innate and acquired mechanisms of host resistance to infection and growth, increased burden of infectious morbidity, mild to severe (blinding) stages of xerophthalmia, and increased risk of mortality.

South Africa has implemented a national vitamin A supplementation (VAS) programme for children 6 months to five years of age and for females post–partum. In addition, a food fortification programme was enacted in 2003. The 2005 National Food Consumption

Survey (Labadarios 2007) revealed very high levels of vitamin A deficiency among children (63.6%) based on the WHO recommended serum retinol level cut off of < 0.7 µmol/L. The present SANHANES-1 survey assessed vitamin A status of this vulnerable group in order to track the impact of current national policy.

Serum vitamin A (retinol) concentrations of < 0.70 mmol/L have traditionally been considered indicative of deficiency in children, based on empirical data from population–based studies that did not exclude the influence of inflammation on serum vitamin A levels. The findings of the 2005 National Food Consumption Survey, documented, however, that the presence of inflammation did not adversely impact on serum vitamin A levels. In this survey, a serum vitamin A concentration of < 0.70 mmol/L, as defined by the WHO, has been used for both children and adults in the assessment of vitamin A status, as follows:

- Vitamin A deficient: serum retinol concentration < 0.70 µmol/L.
- Vitamin A sufficient: serum retinol concentration ≥ 0.70 µmol/L.

The following prevalence cut–offs for low serum retinol (< 0.70µmol/L) to define VAD in populations and its level of public health significance, were applied (WHO 2011):

Degree of public health problem			
	Mild	Moderate	Severe
Prevalence of low serum retinol (< 0.70 µmol/L)	2–9%	10–19%	20% or more

Results

At the national level, the VAD prevalence was 43.6%. The mean (95% CI) serum vitamin A and vitamin A deficiency category of children under five years, was 0.72 µmol/L (males) and 0.79 µmol/L (females) young(Table 3.8.1.1) with a respective VAD prevalence of 49.3% and 39%.

Children in urban formal areas had the highest mean retinol concentration and the lowest VAD prevalence (0.82 µmol/L and 31.9%), while the opposite was true for urban informal areas (0.69 µmol/L and 55.1%).

Only three provinces had sample numbers above 50, viz. Western Cape, Eastern Cape, and North West. This prevented making meaningful comparisons with the other provinces. The respective mean retinol concentrations and VAD prevalence for the three provinces were 0.78 µmol/L and 43.6%; 0.76 µmol/L and 41.1%; 0.67 µmol/L and 57.1%. Mean serum retinol was significantly different between the Western Cape and North West.

Black African children had the lowest mean retinol concentration (0.74 µmol/L) and the highest VAD prevalence (45.4%) while coloured children had a mean retinol concentration of 0.81 µmol/L and prevalence of 33.4%. None of these differences were significant.

Discussion

It is almost ten years since vitamin A supplementation (2002) and food fortification (2003) were implemented in South Africa, and about seven years since the last national food consumption survey (NFCS–2005) (Labadarios 2007) when vitamin A status was assessed in children. A comparison with the current SANHANES-1 results shows that among children younger than five years, a decrease in the national prevalence of VAD by 20%

Table 3.8.1.1: Mean vitamin A and percentage of children under five years of age with abnormal vitamin A status and vitamin A supplementation received by sex, age, locality, province and race, South Africa 2012

Background characteristics	Serum Vitamin A µmol/L		Vitamin A <0.7 µmol/L		Vitamin A ≥ 0.7 µmol/L		
	Mean	95% CI	%	95%CI	%	95%CI	Sample
Sex							
Males	0.72	[0.65–0.78]	49.3	[38.9–59.8]	50.7	[40.2–61.1]	221
Females	0.79	[0.74–0.83]	39.0	[30.5–48.3]	61.0	[51.7–69.5]	217
Total	0.75	[0.70–0.79]	43.6	[36.3–51.2]	56.4	[48.8–63.7]	438
Age group							
< 2 years	*	*	*	*	*	*	94
2–4 years	0.75	[0.70–0.80]	42.2	[33.9–50.8]	57.8	[49.2–66.1]	343
Total	0.75	[0.70–0.79]	43.6	[36.3–51.2]	56.4	[48.8–63.7]	437
Locality							
Urban formal	0.82	[0.72–0.92]	31.9	[18.7–48.8]	68.1	[51.2–81.3]	179
Urban informal	*	*	*	*	*	*	68
Rural formal	*	*	*	*	*	*	95
Rural informal	*	*	*	*	*	*	96
Total	0.75	[0.70–0.79]	43.6	[36.3–51.2]	56.4	[48.8–63.7]	438
Province							
Western Cape	0.78	[0.72–0.84]	43.6	[31.2–56.9]	56.4	[43.1–68.8]	109
Eastern Cape	*	*	*	*	*	*	96
Northern Cape	*	*	*	*	*	*	42
Free State	*	*	*	*	*	*	35
KwaZulu-Natal	*	*	*	*	*	*	14
North West	*	*	*	*	*	*	94
Gauteng	*	*	*	*	*	*	18
Mpumalanga	*	*	*	*	*	*	13
Limpopo	*	*	*	*	*	*	17
Total	0.75	[0.70–0.79]	43.6	[36.3–51.2]	56.4	[48.8–63.7]	438
Race							
African	0.74	[0.68–0.79]	45.4	[37.0–54.1]	54.6	[45.9–63.0]	312
White	*	*	*	*	*	*	*
Coloured	0.81	[0.75–0.87]	33.4	[23.6–44.9]	66.6	[55.1–76.4]	123
Asian/Indian	*	*	*	*	*	*	1
Total	0.75	[0.70–0.79]	43.5	[36.2–51.1]	56.5	[48.9–63.8]	436

95% CI: 95% confidence interval

** Too few observations to report reliably*

(43.6% compared with 63.6%) and a 17% increase in mean retinol. The current mean, however, still remains just above the cut-off for VAD, at 0.75 µmol/L. Children from rural formal areas were the only group that showed a decrease in mean retinol and an increase in VAD prevalence, compared with the NFCS–2005 (0.74 µmol/L vs 0.71 µmol/L and 43.8% compared with 51% respectively). While children from the Western Cape and Eastern

Cape showed an increase in mean retinol compared to 2005, North West Province children showed a decreased mean retinol (0.73 µmol/L to 0.67 µmol/L) and an increase in VAD prevalence (49.6% to 57.15%). Comparisons could only be made for black African and coloured children since there were no white children and only one Indian child. While not significant, coloured children had better vitamin A status than black African children. According to the WHO criteria, the national prevalence of VAD (43.6%) places South Africa in the *severe* public health importance category for children.

Despite the welcome decrease, by almost a third, in childhood VAD prevalence, the mean retinol concentration still remains around the VAD cut-off but is likely to improve further as the long–term effects of the food fortication policy become more prominent. Despite the small number of the provincial samples and the consequent limitations of the interpretation of the findings, all provinces had a prevalence higher than 20%, which according to the WHO classifications there is a severe problem of public healh significance of vitamin A deficiency in the country. The DEVTA trial (Awasthi et al. 2013) of vitamin A supplementation in India (conducted from 1998 and published in 2013) with data on over 5 000 children aged 1–6 years, showed a VAD prevalence of of 56.7% and a mean retinol of 0.67 µmol/L. While the two populations are not comparable, the ages are, and the South African results remain a concern. Results of a 2010 national food consumption survey of children in Vietnam (Arnoud L 2012) showed that VAD was present in 10.1% while the mean retinol concentration was 1.04 µmol/L. It is apparent that South Africa has some way to go yet in improving the vitamin A status of its children. A local benchmark is needed and there is an urgent need to ensure that children from all socio-economic strata are included in future surveys. Further, issues around the implementation and coverage of the VAS programme need to be urgently addressed.

Finally, it should be remembered that optimal breast feeding of infants and young children and consumption of an adequate and varied diet with vitamin A rich foods by both women and children, combined with other health improvement measures such as control of infectious diseases, are the best strategies for avoiding vitamin A deficiency. Furthermore, the current policy on food fortification should continue despite recent evidence (Awasthi et al. 2013) that vitamin A status may have only a modest effect on child mortality.

3.8.2 Anaemia and iron status in children under five years of age

It is estimated that 600 million preschool- and school-age children worldwide are anaemic, and it is assumed that at least half of these cases are attributable to iron deficiency (WHO/CDC 2008). Anaemia is characterised by a reduction in the oxygen-carrying capacity of blood, such that the physiological oxygen needs of the affected individual can no longer be met. In addition to iron deficiency, other micronutrient deficiencies (e.g. folate, vitamin B12 and vitamin A), chronic inflammation and inherited disorders of haemoglobin structure can all cause anaemia (WHO/UNICEF/UNU 2001).

Iron deficiency (ID), a common form of nutritional deficiency during childhood, results from sustained negative iron balance, which is caused by inadequate dietary intake, absorption and/or utilization of iron, increased iron requirements during the growth period, or blood loss due to parasitic infections such as malaria, soil-transmitted helminth infestations and schistosomiasis. In later stages of iron depletion, the haemoglobin (Hb) concentration decreases, resulting in anaemia. Diagnosis of anaemia requires measurement of the Hb concentration, while serum ferritin and serum soluble transferrin receptor levels are commonly used as indicators of iron status. A diagnosis of iron deficiency anaemia (IDA) is made when there is both anaemia and iron deficiency (WHO 2011b).

Children are particularly vulnerable to iron deficiency anaemia because of their increased iron requirements in the periods of rapid growth, especially in the first 5 years of life. Iron deficiency anaemia in children has been linked to increased childhood morbidity and impaired cognitive development and school performance. Both epidemiological and experimental data suggest that when these impairments occur at an early age, they may be irreversible, even after repletion of iron stores, thus reinforcing the importance of preventing this condition (Beard 2001; Lozoff 2007). Public health interventions to ameliorate micronutrient malnutrition in preschool and school-age children include the promotion of dietary diversification with foods rich in highly absorbable vitamins and minerals, anthelminthic treatment, mass fortification of staple foods and condiments, home (point of use) fortification of foods, and provision of micronutrient supplements (De Maeyer 1989).

The prevalence of anaemia (Hb < 11 g/dL) as a problem of public health significance can be classified as follows (WHO/CDC 2008):

≤ 4.9%, no public health problem;
5–19.9%, mild public health problem;
20–39.9%, moderate public health problem;
≥ 40%, severe public health problem

The following are the recommended Hb cut-offs for defining anaemia prevalence in children under five years (WHO 2011a):

Mild anaemia	Moderate anaemia	Severe anaemia
Hb 10.9–10.0 g/dL	Hb 9.9–7.0 g/dL	Hb <7g/dL

Serum ferritin measurements were performed and the following cut–offs were applied for the diagnosis of iron status (WHO 2011b):
Iron depletion/deficiency: Ferritin < 12 ng/mL and Hb ≥ 11 g/dL
Iron deficiency anaemia: Ferritin < 12 ng/mL and Hb < 11 g/dL

Results

Because of the low overall sample numbers, sub-national comparisons were not made for anaemia and iron deficiency anaemia. Further, since there were no sex differences, the data are presented combined.

Overall, the prevalence of anaemia was 10.7%, mild anaemia 8.6% and moderate anaemia 2.1%. There were no cases of severe anaemia (Table 3.8.2.1; Figure 3.8.2.1). Bearing in mind the small number of observations in some age groups, the prevalence of anaemia was highest in the 24-35 months (15.2%) and decreased to 3.0% in the 48–59 months age group. There were no overall statistically significant differences by locality and by province. The coloured race group children had the highest prevalence of anaemia (13.8%).

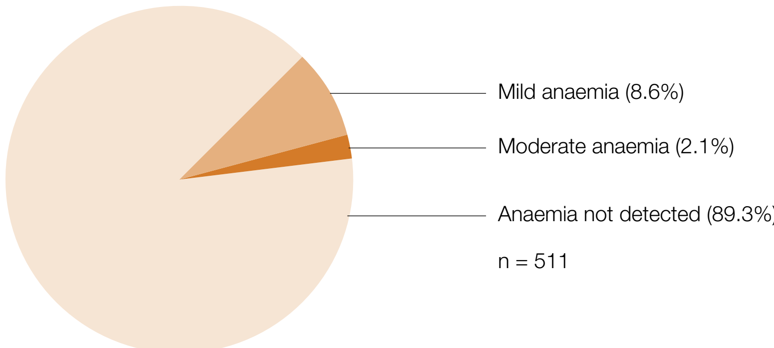
Overall, the mean Hb was 12.2 g/dL and mean ferritin 40.7 ng/mL in all children (Table 3.8.2.2) and the latter had an overall trend to decrease significantly by age. Although not significant, there was a trend for ferritin concentrations to be higher among children in rural when compared with those in urban areas of residence. Mean ferritin concentration was also overall significantly higher in rural localities and, insignificantly, in coloured children.

Table 3.8.2.1: Severity of anaemia in children under five years of age by sex, age (in months), locality, province and race, South Africa 2012

Background characteristics	Presence of anaemia: Anaemia detected (Hb < 11 g/dL) %	95% CI	Presence of anaemia: No anaemia detected (Hb ≥ 11 g/dL) %	95% CI	Severity of anaemia: Mild anaemia (Hb 10–10.9 g/dL) %	95% CI	Severity of anaemia: Moderate anaemia (Hb 7–9.9 g/dL) %	95% CI	Severity of anaemia: Severe anaemia (Hb < 7 g/dL) %	95% CI	Sample n
Sex											
Males	11.2	[7.1–17.3]	88.8	[82.7–92.9]	9.0	[5.4–14.7]	2.2	[0.8–6.1]	0.0		249
Females	10.1	[6.9–14.4]	89.9	[85.6–93.1]	8.0	[5.2–12.2]	2.0	[0.9–4.6]	0.0		262
Total	10.7	[7.9–14.4]	89.3	[85.6–92.1]	8.6	[6.1–12.0]	2.1	[1.0–4.2]	0.0		511
Age											
<6 months	*	*	*	*	*	*	*	*	*		21
7–11 months	*	*	*	*	*	*	*	*	*	*	10
12–23 months	*	*	*	*	*	*	*	*	*	*	47
24–35 months	15.2	[9.1–24.2]	84.8	[75.8–90.9]	11.7	[6.2–21.0]	3.5	[1.6–7.7]	0.0		138
36–47 months	10.9	[6.8–17.0]	89.1	[83.0–93.2]	10.2	[6.2–16.2]	0.7	[0.2–2.7]	0.0		154
48–59 months	3.0	[1.2–7.4]	97.0	[92.6–98.8]	2.6	[1.0–7.1]	0.4	[0.1–2.6]	0.0		141
Total	10.7	[7.9–14.4]	89.3	[85.6–92.1]	8.6	[6.1–12.0]	2.1	[1.0–4.2]	0.0		511
Locality											
Urban formal	13.0	[7.1–22.6]	87.0	[77.4–92.9]	12.0	[6.4–21.5]	1.0	[0.4–2.8]	0.0		179
Urban informal	*	*	*	*	*	*	*	*	*		74
Rural formal	14.1	[8.5–22.6]	85.9	[77.4–91.5]	13.1	[7.7–21.5]	1.0	[0.1–6.8]	0.0		102
Rural informal	7.7	[4.5–12.9]	92.3	[87.1–95.5]	5.0	[2.6–9.3]	2.8	[1.0–7.4]	0.0		156
Total	10.7	[7.9–14.4]	89.3	[85.6–92.1]	8.6	[6.1–12.0]	2.1	[1.0–4.2]	0.0		511
Province											
Western Cape	*	*	*	*	*	*	*	*	*		93
Eastern Cape	*	*	*	*	*	*	*	*	*		92
Northern Cape	*	*	*	*	*	*	*	*	*		32
Free State	*	*	*	*	*	*	*	*	*		29
KwaZulu-Natal	*	*	*	*	*	*	*	*	*		58
North West	*	*	*	*	*	*	*	*	*		85
Gauteng	*	*	*	*	*	*	*	*	*		29
Mpumalanga	*	*	*	*	*	*	*	*	*		50
Limpopo	*	*	*	*	*	*	*	*	*		43
Total	10.7	[7.9–14.4]	89.3	[85.6–92.1]	8.6	[6.1–12.0]	2.1	[1.0–4.2]	0.0		511
Race											
African	10.4	[7.3–14.4]	89.6	[85.6–92.7]	8.2	[5.5–12.0]	2.2	[1.0–4.5]	0.0		396
White	*	*	*	*	*	*	*	*	*		0
Coloured	13.8	[8.4–21.8]	86.2	[78.2–91.6]	12.2	[7.0–20.2]	1.7	[0.4–6.5]	0.0		110
Asian/Indian	*	*	*	*	*	*	*	*	*		3
Total	10.7	[7.9–14.4]	89.3	[85.6–92.1]	8.6	[6.1–12.1]	2.1	[1.0–4.2]	0.0		509

*95% CI: 95% confidence interval * Too few observations to report reliably*

Figure 3.8.2.1: Anaemia status of children under five years of age



** There no cases of severe anaemia among children under 5 years*

Table 3.8.2.2: Mean haemoglobin and mean ferritin in children under 5 years of age by sex, age (in months), locality, province and race, South Africa 2012

Background characteristics	Mean Hb		Total	Mean ferritin		Total
	Mean	95% CI	n	Mean	95% CI	n
Sex						
Males	12.2	[12.0–12.4]	249	37.7	[30.3–45.1]	230
Females	12.1	[11.9–12.2]	262	45.1	[33.4–56.9]	226
Total	**12.2**	**[12.0–12.3]**	**511**	**40.7**	**[33.9–47.6]**	**456**
Age group						
0–6 months	*	*	21	*	*	24
7–11 months	*	*	10	*	*	11
12–23 months	*	*	47	*	*	75
24–35 months	12.0	[11.7–12.3]	138	*	*	95
36–47 months	12.2	[12.0–12.4]	154	33.7	[25.6–41.9]	136
48–59 months	12.3	[12.0–12.6]	141	36.3	[31.2–41.5]	115
Total	12.2	[12.0–12.3]	511	40.7	[33.9–47.6]	456
Locality						
Urban formal	12.1	[11.8–12.4]	179	37.6	[27.1–48.1]	184
Urban informal	*	*	74	*	*	72
Rural formal	12.3	[12.0–12.5]	102	*	*	99
Rural informal	12.2	[12.0–12.4]	156	*	*	99
Total	12.2	[12.0–12.3]	511	40.7	[33.9–47.6]	454
Province						
Western Cape	*	*	93	39.8	[34.7–44.9]	110
Eastern Cape	*	*	92	57.9	[39.0–76.8]	114
Northern Cape	*	*	32	*	*	38
Free State	*	*	29	*	*	26
KwaZulu-Natal	*	*	58	*	*	8
North West	*	*	85	*	*	92
Gauteng	*	*	29	*	*	22
Mpumalanga	*	*	50	*	*	36
Limpopo	*	*	43	*	*	7
Total	12.2	[12.0–12.3]	511	40.7	[33.9–47.6]	453

Race						
African	12.2	[12.0–12.3]	396	40.1	[32.1–48.2]	323
White	*	*	0	*	*	0
Coloured	12.1	[11.9–12.3]	110	44.9	[38.2–51.6]	128
Asian/Indian	*	*	3	*	*	2
Total	12.2	[12.0–12.3]	509	40.8	[33.9–47.7]	453

*95% CI: 95% confidence interval * Too few observations to report reliably*

The prevalence of iron depletion was 8.1%, of iron deficiency anaemia 1.9% and of anaemia due to other causes 10.7% (Table 3.8.2.3; Figure 3.8.2.2). The prevalence of iron depletion was significantly the highest in the 36–47 months age group (14.0%) as was that of iron deficiency (2.2%). Due to small sample sizes comparisons across localities, provinces and race groups were not possible.

Table 3.8.2.3: Iron status of children under five years of age by sex, age (in months), locality, province and race, South Africa 2012

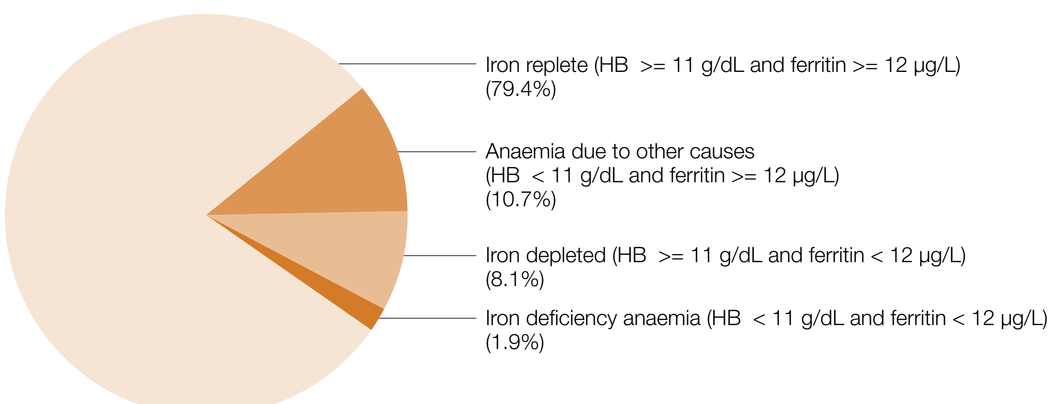
Background characteristics	Iron depleted (Hb ≥ 11 g/dL and ferritin < 12 ug/L)		Iron deficiency anaemia (Hb < 11 g/dL and ferritin < 12 ug/L)		Iron replete (Hb ≥ 11 g/dL and ferritin ≥ 12 ug/L)		Anaemia due to other causes (Hb < 11 g/dL and ferritin ≥ 12ug/L)		Sample size
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	
Sex									
Males	7.4	[3.3–15.9]	2.2	[0.7–6.8]	79.5	[70.2–86.5]	11.0	[6.9–17.1]	172
Females	9.0	[4.3–17.9]	1.5	[0.4–5.9]	79.2	[70.5–85.8]	10.3	[6.3–16.3]	177
Total	8.1	[4.2–14.9]	1.9	[0.8–4.5]	79.4	[72.6–84.8]	10.7	[7.5–15.0]	349
Age									
<6 months	*	*	*	*	*	*	*	*	8
6–11 months	*	*	*	*	*	*	*	*	0
12–23 months	*	*	*	*	*	*	*	*	30
24–35 months	*	*	*	*	*	*	*	*	79
36–47 months	14.0	[5.5–31.3]	2.2	[0.7–6.9]	72.1	[57.8–83.0]	11.7	[6.6–19.8]	125
48–59 months	2.7	[0.7–10.1]	0.0		94.8	[88.6–97.7]	2.5	[1.1–5.6]	107
Total	8.1	[4.2–14.9]	1.9	[0.8–4.5]	79.4	[72.6–84.8]	10.7	[7.5–15.0]	349
Locality									
Urban formal	5.8	[2.1–14.7]	2.0	[0.5–8.2]	81.8	[70.8–89.3]	10.4	[5.7–18.2]	138
Urban informal	*	*	*	*	*	*	*	*	59
Rural formal	*	*	*	*	*	*	*	*	82
Rural informal	*	*	*	*	*	*	*	*	70
Total	8.1	[4.2–14.9]	1.9	[0.8–4.5]	79.4	[72.6–84.8]	10.7	[7.5–15.0]	349
Province									
Western Cape	*	*	*	*	*	*	*	*	86
Eastern Cape	*	*	*	*	*	*	*	*	86
Northern Cape	*	*	*	*	*	*	*	*	31

Free State	*	*	*	*	*	*	*	*	19
KwaZulu-Natal	*	*	*	*	*	*	*	*	7
North West	*	*	*	*	*	*	*	*	73
Gauteng	*	*	*	*	*	*	*	*	19
Mpumalanga	*	*	*	*	*	*	*	*	23
Limpopo	*	*	*	*	*	*	*	*	5
Total	8.1	[4.2–14.9]	1.9	[0.8–4.5]	79.4	[72.6–84.8]	10.7	[7.5–15.0]	349
Race									
African	9.0	[4.5–17.0]	2.0	[0.7–5.2]	78.8	[70.9–85.0]	10.3	[6.8–15.3]	247
White	*	*	*	*	*	*	*	*	0
Coloured	3.0	[1.0–9.0]	1.5	[0.4–5.7]	81.9	[72.6–88.6]	13.5	[7.9–22.2]	99
Asian/Indian	*	*	*	*	*	*	*	*	1
Total	8.1	[4.2–14.9]	1.9	[0.8–4.5]	79.3	[72.5–84.7]	10.7	[7.5–15.0]	347

95% CI: 95% confidence interval

** Too few observations to report reliably*

Figure 3.8.2.2 Iron status of children under five years of age



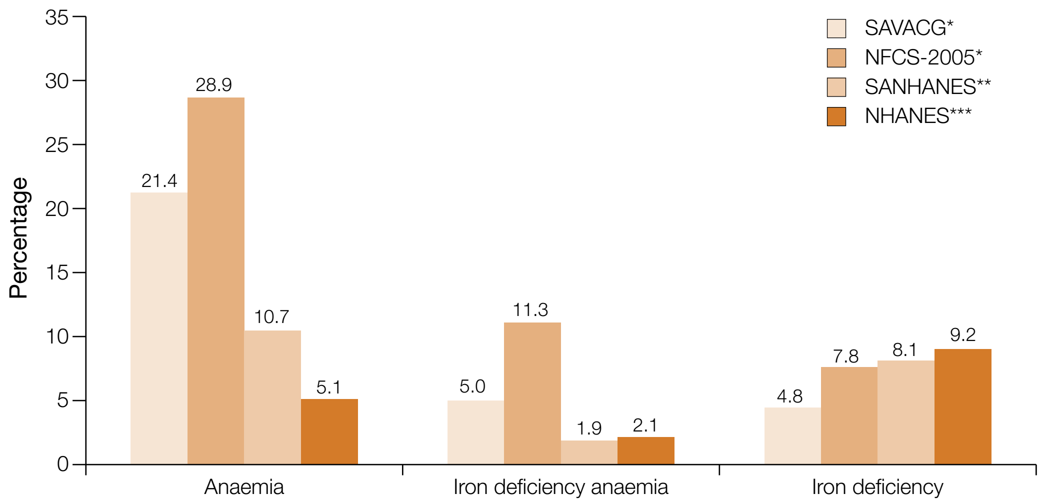
Discussion

The current SANHANES-1 results for iron status of children under five years of age can be compared with the results of the NFCS-2005 (Labadarios 2007) and SAVACG (SAVACG 1995) surveys conducted in South Africa in 2005 and 1994, respectively.

Mean Hb in the present survey was significantly higher than NFCS–2005 and SAVACG children, 12.2, 11.5 and 11.8 g/dL, respectively. The respective anaemia (Hb < 11 g/dL) prevalence was 10.7, 28.9 and 21.4% (Figure 3.8.2.3). Mean ferritin was also higher than the previous surveys (40.7 compared with 33.4 and 34.6 ng/mL; not significant), with the prevalence of iron depletion and IDA being much lower, except for ID in SAVACG which was slightly lower than the SANHANES-1 children (8.1 compared with 11%) (see Figure 3.8.2.2). Moderate and severe anaemia was much lower in the present survey (2.1%) when compared with that of 6.4% in 2005.

Comparison with global and regional figures shows that South African children fare much better than the rest of Africa but not necessarily as well as the High Income Regions

Figure 3.8.2.3: Anaemia, iron deficiency anaemia and iron depletion/deficiency in children under five years



* SAVACG and NFCS-2005: children aged 1–5 years

** SANHANES: children aged less than 5 years

***NHANES: children aged 1–3 years

(Stevens 2013). For example, in 2013, the worldwide anaemia prevalence was 43%; 11% for High Income Regions, 46% for Southern Africa; 71% for Central and West Africa, 23% for Southern and Tropical Latin America. The respective percentages for severe anaemia for these regions were 0.1, 0.9, 4.9, and 0.2%, while the respective means for Hb concentrations were 12.3, 11.0, 10.0, and 11.9 g/dL. Figure 3.8.2.1 shows the comparison between the three national surveys, as well as with 1–3-year-olds from NHANES 1999–2002 in the USA (Baker 2010). The age groups and indicators used for ID and IDA are not the same; however, the anaemia cut-off was the same. Bearing this in mind, the SANHANES-1 results are close to those of NHANES, except for anaemia prevalence which was 10.7% and 5.1%, respectively.

The findings of the present survey indicate that anaemia and iron status has improved substantially among children under five years of age in South Africa since the last national survey in 2005. Compared to 2005, the prevalence of anaemia decreased by 63.0%, that of iron deficiency anaemia by 83.2%, and iron depletion/deficiency increased by 3.8%. This after the 2005 survey showed deterioration from the 1994 SAVACG survey findings. The change could be due to nutritional and/or health factors, viz. the national food fortification programme; the effect of vitamin A supplementation; better infant and young child feeding practices; improved primary health care, and better care of sick children, among others (WHO 2011).

While iron deficiency is frequently the primary factor contributing to anaemia, it is important to recognise that the control of anaemia requires a multi-sectoral approach which, through integrated interventions, addresses the various factors that play a significant role in causing anaemia in a given community. In addition to iron deficiency, infectious diseases such as malaria, helminth infections, other chronic infections, particularly HIV/AIDS and tuberculosis, as well as other micronutrient deficiencies, are especially important (WHO/UNICEF 2006).

3.8.3 Dietary knowledge

NCDs and risk factors for NCDs affect people of all ages including children. The increasing levels of obesity among children and youth are public health concerns in low and middle income countries. In the political declaration on prevention and control of NCDs in September 2011, heads of state and government and their representatives declared that among children, obesity, and unhealthy diet and physical inactivity were strongly linked with the four key NCDs – cardiovascular disease, cancer, chronic respiratory disease and diabetes (UN General Assembly 2011). Globalisation has increased the availability of food including foods that are of low nutritional value, high in unhealthy fats, sugar and salt, while eating food that is not prepared at home, and it has also become common, leading to cultural changes in food and meal arrangements. Low nutritional value food is usually affordable and easily accessible even in impoverished communities. In South Africa, the Life Orientation curriculum that is taught in primary schools, provides children with nutrition knowledge about healthy eating early in their formal education process.

General nutrition knowledge

Children's dietary knowledge was assessed by asking them to state the food that should be included in high and low quantities in their diets, to correctly identify healthier alternatives between pairs of foods and to correctly identify healthier fats. On the basis of purpose-specific questions to assess these aspects of nutritional knowledge and with the aid of colour photographs of foods, a general nutrition score was designed in which, out of a possible maximum of 6, a score of 0–2 indicated low general nutrition knowledge, a score of 3–4 a medium general nutrition knowledge, and 5–6 a high general nutrition knowledge.

Results

Overall, the mean general nutrition knowledge score achieved by children was 1.8 out of a total of 6 points, irrespective of the sex of the child (Table 3.8.3.1). The majority (71.7%) had low scores of 0 to 2 points, 27.3% had medium scores of 3 to 4 points, while only 0.9% achieved a high score of 5 to 6 points on general nutrition knowledge. There were no significant differences in nutrition knowledge amongst children by sex, localiy and race.

Analysis by province indicated that the majority of children in Eastern Cape, Free State and North West (77.1%, 81.7% and 76.3%, respectively) were more likely to have poor general nutrition knowledge compared with children in Western Cape (63.3%).). Conversely, children in Western Cape were more likely to have better general nutrition knowledge (36.0% with medium scores) than children in Eastern Cape, Free State and North West (22.0%, 18.3% and 22.8%, respectively). There were no significant differences between provinces among the children who achieved high scores.

Correct identification of healthy alternatives

The ability of children to correctly distinguish between healthy and unhealthy food alternatives is important knowledge, which may influence children's preferences for healthy food at an early age. Children live, play and work in environments that provide a variety of food choices but at the same time families are constrained by their economic circumstances when they purchase food for family consumption. Alternative, but less healthy foods, are available to children in all environments.

*Table 3.8.3.1: General nutrition knowledge score among children aged 10–14 years by sex, locality, province and race, South Africa 2012**

Background characteristics	Mean score	95% CI	Low 0–2 %	Low 0–2 95% CI	Medium 3–4 %	Medium 3–4 95% CI	High 5–6 %	High 5–6 95% CI	Total n
Sex									
Male	1.8	[1.80–1.80]	71.8	[68.2–75.1]	27.4	[24.0–30.9]	0.9	[0.5–1.6]	1 215
Female	1.8	[1.60–2.00]	71.7	[68.1–75.1]	27.3	[23.9–30.9]	1.0	[0.5–2.2]	1 279
Locality									
Urban formal	1.8	[1.60–2.00]	72.0	[67.1–76.4]	27.3	[22.9–32.1]	0.7	[0.3–2.0]	1 171
Urban informal	1.8	[1.60–2.00]	71.6	[64.2–78.0]	26.6	[20.4–33.8]	1.8	[0.8–4.2]	320
Rural formal	1.8	[1.60–2.00]	70.7	[63.9–76.7]	28.9	[23.0–35.7]	0.4	[0.1–1.5]	354
Rural informal	1.8	[1.60–2.00]	71.7	[68.1–75.1]	27.2	[23.8–30.9]	1.1	[0.5–2.5]	733
Province									
Western Cape	1.9	[1.70–2.10]	63.3	[56.5–69.6]	36.0	[29.7–42.8]	0.7	[0.2–2.2]	307
Eastern Cape	1.6	[1.40–1.80]	77.1	[70.8–82.4]	22.0	[17.0–28.1]	0.8	[0.2–3.0]	342
Northern Cape	1.9	[1.51–2.30]	68.1	[58.1–76.6]	30.8	[22.3–40.8]	1.2	[0.3–4.8]	167
Free State	1.6	[1.40–1.80]	81.7	[75.2–86.9]	18.3	[13.1–24.8]	0.0		180
KwaZulu-Natal	1.9	[1.70–2.10]	64.3	[57.8–70.2]	34.5	[28.5–41.0]	1.2	[0.4–3.6]	468
North West	1.6	[1.40–1.80]	76.3	[71.4–80.6]	22.8	[18.6–27.7]	0.8	[0.2–3.2]	302
Gauteng	1.8	[1.60–2.00]	75.0	[67.0–81.6]	23.7	[17.3–31.5]	1.3	[0.4–3.6]	369
Mpumalanga	1.7	[1.50–2.00]	72.6	[64.5–79.5]	26.4	[19.4–34.8]	1.0	[0.3–3.5]	222
Limpopo	1.9	[1.70–2.10]	70.7	[65.1–75.8]	28.8	[23.7–34.6]	0.4	[0.1–3.2]	221
Race									
African	1.8	[1.80–1.80]	72.4	[69.5–75.1]	26.6	[23.9–29.5]	1.0	[0.6–1.8]	1 823
White	*	*	*	*	*	*	*	*	53
Coloured	1.9	[1.70–2.10]	65.4	[59.0–71.3]	33.7	[27.8–40.1]	0.9	[0.4–2.3]	491
Asian/Indian	2.1	[1.32–2.88]	61.1	[37.0–80.8]	38.5	[18.8–62.8]	0.4	[0.1–3.1]	121
Total	1.8	[1.80–1.80]	71.7	[69.0–74.3]	27.3	[24.8–30.0]	0.9	[0.6–1.6]	2 578

95% CI: 95% confidence interval

** Too few observations to record reliably*

*The knowledge score was based on six questions relating to food groups:

1 Which food group should be included in most meals?
2 Which food group should be most restricted in meals?
3 Which food group contains food with lots of fibre?
4 Which food group best provides the body with energy?
5 Which food group builds the body's muscles?
6 Which food group protects the body against illness?

*Table 3.8.3.2: Correct identification score of healthy alternatives among children aged 10–14 years by sex, locality, province and race, South Africa 2012**

Background characteristics			Low (0–2)		Medium (3–5)		High (6–7)		Total
	Mean score	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex									
Male	5.0	[4.85–5.17]	9.9	[7.7–12.7]	39.2	[35.7–42.7]	50.9	[47.3–54.5]	1 215
Female	5.3	[5.11–5.42]	7.2	[5.4–9.5]	37.3	[33.2–41.5]	55.5	[51.1–59.8]	1 279
Locality									
Urban formal	5.3	[5.08–5.52]	8.1	[5.5–11.9]	32.8	[28.4–37.6]	59.1	[53.7–64.2]	1 171
Urban informal	4.8	[4.5–5.16]	12.5	[8.0–18.9]	40.3	[35.0–45.8]	47.3	[41.2–53.4]	320
Rural formal	4.9	[4.5–5.21]	10.5	[5.8–18.4]	45.4	[39.4–51.6]	44.1	[38.0–50.3]	354
Rural informal	5.1	[4.91–5.24]	7.7	[5.3–11.1]	43.0	[38.8–47.3]	49.3	[45.3–53.2]	733
Province									
Western Cape	5.1	[4.87–5.37]	8.8	[5.5–13.7]	37.8	[31.7–44.4]	53.4	[46.2–60.4]	307
Eastern Cape	4.9	[4.64–5.19]	9.5	[5.2–16.7]	46.7	[39.7–53.9]	43.8	[38.5–49.2]	342
Northern Cape	4.6	[3.53–5.65]	19.0	[6.4–44.5]	36.6	[28.7–45.3]	44.4	[29.0–60.9]	167
Free State	5.3	[5.1–5.46]	3.1	[1.3–7.1]	47.3	[37.0–57.9]	49.6	[40.1–59.2]	180
KwaZulu-Natal	4.9	[4.55–5.3]	12.6	[7.6–20.2]	35.2	[30.1–40.6]	52.2	[46.1–58.3]	468
North West	4.8	[4.52–5.09]	11.2	[7.6–16.1]	45.0	[38.7–51.4]	43.9	[37.6–50.4]	302
Gauteng	5.5	[5.27–5.78]	5.4	[3.2–8.7]	30.8	[23.7–38.9]	63.8	[55.5–71.5]	369
Mpumalanga	4.8	[4.27–5.27]	15.6	[9.4–24.7]	34.4	[25.9–44.1]	50.0	[39.3–60.6]	222
Limpopo	5.5	[5.26–5.69]	1.9	[0.7–4.8]	42.7	[35.0–50.8]	55.4	[47.5–63.1]	221
Race									
African	5.1	[4.96–5.24]	8.9	[6.9–11.4]	39.3	[36.1–42.5]	51.8	[48.5–55.1]	1823
White	*	*	*	*	*	*	*	*	53
Coloured	5.1	[4.79–5.37]	8.9	[5.6–13.9]	37.6	[32.7–42.8]	53.4	[46.9–59.9]	491
Asian/Indian	5.0	[3.94–6.09]	17.0	[6.9–36.2]	24.7	[14.9–38.0]	58.4	[38.9–75.5]	121
Total	5.1	[5.01–5.27]	8.6	[6.8–10.7]	38.2	[35.4–41.2]	53.2	[50.1–56.2]	2 578

** Too few observations to record reliably*

95% CI: 95% confidence interval

*The knowledge score was based on seven sets of options from which to identify the healthier alternative

1 Milk or Cremora/Ellis Brown
2 Plain popcorn or chips/crisps
3 Boiled egg or fried egg
4 Cool drink or water
5 Sweets or peanuts and raisins
6 Banana or cookies/biscuits
7 Bread and jam, or bread and peanut butter

Correct identification of healthy food alternatives by children was assessed by asking the respondents to identify the healthier alternative between the following pairs: (1) Milk or Cremora/Ellis Brown; (2) Plain popcorn or chips/crisps; (3) Boiled egg or fried egg; (4) Cool drink or water; (5) sweets or peanuts and raisins; (6) Banana or cookies/biscuits; (7) Bread and jam, or bread and peanut butter. A score of 0–2 indicated low score in identifying healthy alternatives, a score of 3–5, a medium score in identifying healthy alternatives, and 5–6 a high score correctly identifying healthy alternatives.

Results

Overall, the children achieved a medium mean score of 5.1 out of a total of 7 points for the correct identification of healthier alternatives (Table 3.8.3.2). The majority (53.2%) had high scores (6 or 7 points), 38.2% had medium scores (3 to 5 points) while 8.6% achieved low scores (0 to 2 points). There were no significant differences in the correct identification of healthy alternatives by sex and race.

In terms of locality, there were no significant differences in the group that achieved low scores. However, children in the urban formal settings were significantly more likely to achieve high knowledge scores (59.1%) compared to all other settings (44.1% to 49.3%). Children in rural formal settings were significantly more likely (45.4%) to achieve medium knowledge scores on healthier alternatives than children in urban formal settings (32.8%).

In terms of provinces, Mpumalanga had significantly high rates (15.6%) of low knowledge scores on healthier alternatives than Free State (3.1%), Gauteng (5.4%) and Limpopo (1.9%) but not other provinces. Children in Eastern Cape had a significantly higher rate of medium knowledge scores (46.7%) than Gauteng (30.8%) but not all other provinces. Gauteng had a significantly higher rate of high knowledge scores (63.8%) than Eastern Cape (43.8%) and North West (43.9%), but similar to all other provinces.

Correct identification of foods containing healthy fats

Health information and campaigns encourage the consumption of unsaturated fats and discourage the intake of saturated and trans fats, which are mostly found in animal fat. Knowledge and attitudes about foods in terms of whether they contain 'good' fats or 'bad' fats are important social factors that determine individuals' preferences. Children may have inadequate basic knowledge about the different types of fat found in the variety of foods that they consume frequently.

The ability of children to correctly identify foods containing healthy fats was assessed by asking the respondents to identify foods with healthy fats: (1) red meat and chicken with skin; (2) chips, crisps and mazimba; (3) nuts; (4) soft tub margarine; (5) avocado pear; (6) mayonnaise; (7) cookies and biscuits; (8) doughnuts; (9) pilchards and sardines; (10) polony. A score of 0–3 indicated a low score in identifying healthy fats, a score of 4–7 a medium score in identifying healthy fats, and 5–6 a high score in correctly identifying healthy fats.

Results

Overall, the mean score achieved by children for the correct identification of foods containing healthy fats was 5.4 out of a total of 10 points. The majority (69.2%) had medium scores, with the remainder equally distributed between low scores (15.4%) and high scores (15.4%) (Table 3.8.3.3). Knowledge levels between males and females about food that contain healthy fats did not differ significantly.

There were no significant differences between localities in the group that achieved low scores. The majority of children in rural informal settings (75.6%) had medium knowledge scores compared to those in urban formal (65.8%) and rural formal (62.4%) settings. However, children in urban formal settings were significantly more likely (18.3%) to have high knowledge scores about food that contain healthy fats than those in the rural informal setting (10.5%).

The mean score of children in Western Cape was significntly higher (5.79) compared to Eastern Cape, North West and Mpumalanga (5.00, 5.05 and 4.97, respectively). There were no significant differences between provinces with low knowledge scores. The majority of children in Free State (77.9%) had significantly medium knowledge scores compared to those in Gauteng (63.6%) but similar to those in other provinces. Children in Western Cape had a significantly high knowledge scores (21.2%) compared to those in Eastern Cape (9.4%).

Although there were no significant differences in mean knowledge scores, by race, black African children were more likely to show good knowledge (69.5%) than coloured children, while coloured children were more likely to obtain high knowledge scores (24.3%) than black African children (14.7%).

3.8.4 Dietary behaviour

The ability of children to change dietary behaviour from choosing high fat, high sugar and high salt food options to healthy options such as fruit, vegetables and good fats is important for their medium to long-term physical and psychological health. While nutrition knowledge is important for children, the self-perceived ability to change dietary behaviour is even more crucial. According to the National Risk Behaviour Survey, 2002 (Reddy, Panday, Swart, et al. 2003) a high proportion of South African learners in grades 8 to 11 regularly consumed food items high in fat, such as fast foods, cakes and biscuits. Adopting healthy eating behaviours at a young age can help children maintain positive lifestyles and a healthy view of their physical appearance and contribute to their wellbeing. Where children have developed unhealthy tastes and habits, they can be empowered to change them and adopt healthier habits. Sebastian, Goldman and Enns (2010) state that dietary patterns established in childhood and adolescence usually continue during adulthood, and, therefore, have immediate and lifelong benefits of protecting people from the risk of developing NCDs.

Children's perceived ability to change dietary behaviours by reducing intake of fats, sugar, salt and increasing intake of fibre and fruit and vegetables was assessed by developing a behaviour score based on 10 questions relating to the reported ability to change behaviour, 'if you had to, could you…': (1) put less margarine on your bread; (2) eat fewer chips; (3) buy fruit instead of chips; (4) put less sugar in your tea or coffee; (5) put less sugar in your cereal/porridge; (6) eat sweets less often; (7) drink cool drinks less often; (8) eat brown bread instead of white bread; (9) eat more vegetables; (10) eat more fruit. A score of 0–3 indicated low score in changing dietary behaviour, a score of 4–7 a medium score in changing dietary behaviour, and 5–6 a high score in changing dietary behaviour.

Results

Overall, the mean score achieved by children with regard to their perceived ability to change their dietary behaviour was 6.7 out of a total of 10 points. Slightly more than half

*Table 3.8.3.3: Correct identification score among foods containing healthy fats among children aged 10–14 years by sex, locality, province and race, South Africa 2012**

Background characteristics			Low (0–3)		Medium (4–7)		High (8–10)		Total
	Mean score	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex									
Male	5.30	[5.13–5.47]	15.9	[13.3–19.1]	70.0	[66.1–73.6]	14.1	[11.7–16.9]	1 215
Female	5.45	[5.28–5.61]	14.8	[12.4–17.5]	68.4	[65.0–71.7]	16.8	[14.1–20.0]	1 279
Locality									
Urban formal	5.46	[5.25–5.67]	15.9	[12.7–19.7]	65.8	[61.2–70.2]	18.3	[15.2–21.8]	1 171
Urban informal	5.32	[5.03–5.61]	16.8	[13.2–21.2]	66.6	[60.1–72.5]	16.6	[12.3–22.0]	320
Rural formal	5.43	[4.9–5.97]	17.1	[11.4–25.0]	62.4	[53.3–70.6]	20.5	[11.9–33.0]	354
Rural informal	5.27	[5.08–5.46]	13.9	[11.0–17.5]	75.6	[71.6–79.1]	10.5	[8.2–13.4]	733
Province									
Western Cape	5.79	[5.47–6.1]	12.9	[9.1–18.1]	65.8	[58.8–72.2]	21.2	[15.9–27.8]	307
Eastern Cape	5.00	[4.66–5.34]	18.8	[13.2–26.0]	71.8	[64.0–78.5]	9.4	[6.6–13.3]	342
Northern Cape	5.33	[5.03–5.63]	19.1	[14.3–25.1]	69.1	[61.9–75.5]	11.8	[6.6–20.1]	167
Free State	5.49	[5.07–5.92]	10.1	[5.6–17.5]	77.9	[70.9–83.6]	12.1	[7.0–19.9]	180
KwaZulu-Natal	5.36	[5.01–5.72]	15.1	[10.1–21.9]	70.7	[62.9–77.4]	14.2	[11.2–18.0]	468
North West	5.05	[4.72–5.38]	20.0	[15.5–25.5]	65.4	[58.5–71.7]	14.6	[10.1–20.6]	302
Gauteng	5.67	[5.4–5.93]	13.8	[10.0–18.8]	63.6	[56.7–69.9]	22.6	[17.1–29.3]	369
Mpumalanga	4.97	[4.63–5.31]	19.4	[13.6–26.9]	71.5	[62.7–78.9]	9.1	[4.6–17.4]	222
Limpopo	5.31	[5.02–5.6]	13.4	[9.1–19.3]	75.8	[69.7–80.9]	10.9	[7.0–16.5]	221
Race									
African	5.30	[5.15–5.44]	15.8	[13.5–18.4]	69.5	[66.4–72.4]	14.7	[12.6–17.1]	1 823
White	*	*	*	*	*	*	*	*	53
Coloured	5.72	[5.39–6.06]	16.1	[12.1–21.0]	59.6	[53.9–65.1]	24.3	[19.0–30.6]	491
Asian/Indian	5.33	[4.4–6.26]	22.1	[10.7–40.1]	55.9	[35.9–74.1]	22.0	[11.6–37.9]	121
Total	5.38	[5.25–5.5]	15.4	[13.4–17.6]	69.2	[66.4–71.9]	15.4	[13.5–17.6]	2 578

95% CI: 95% confidence interval

** Too few observations to record reliably*

*The knowledge score was based on 10 questions regarding foods that contain healthy fats:

1 red meat and chicken with skin
2 chips, crisps and mazimba
3 nuts
4 soft tub margarine
5 avocado pear
6 mayonnaise
7 cookies and biscuits
8 donuts
9 pilchards and sardines
10 polony

*Table 3.8.4.1: Perceived ability score to change dietary behaviours among children aged 10–14 years by sex, locality, province and race, South Africa 2012**

Background characteristics			Low (0–3)		Medium (4–7)		High (8–10)		Total
	Mean score	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex									
Male	6.57	[6.28–6.85]	20.1	[16.9–23.6]	30.9	[27.4–34.5]	49.1	[45.0–53.2]	1 215
Female	6.86	[6.59–7.13]	17.6	[14.7–20.9]	29.5	[26.2–33.1]	52.9	[48.8–56.8]	1 279
Locality									
Urban formal	6.63	[6.27–6.98]	20.3	[16.4–24.7]	29.0	[25.2–33.1]	50.8	[45.7–55.8]	1 171
Urban informal	6.77	[6.16–7.38]	17.7	[12.7–24.1]	30.2	[24.1–37.2]	52.1	[42.4–61.6]	320
Rural formal	6.42	[5.86–6.99]	22.5	[17.0–29.2]	28.9	[21.4–37.7]	48.6	[40.1–57.3]	354
Rural informal	6.87	[6.48–7.25]	16.5	[12.6–21.3]	32.0	[27.8–36.6]	51.5	[46.0–56.9]	733
Province									
Western Cape	7.07	[6.48–7.67]	18.6	[13.2–25.6]	22.0	[16.5–28.7]	59.4	[50.0–68.2]	307
Eastern Cape	6.81	[6.26–7.36]	18.4	[13.3–24.8]	26.8	[21.1–33.4]	54.8	[47.8–61.7]	342
Northern Cape	7.18	[6.61–7.75]	13.4	[7.6–22.6]	29.7	[19.8–42.0]	56.9	[46.7–66.6]	167
Free State	6.15	[5.46–6.85]	19.0	[13.3–26.4]	44.8	[36.5–53.4]	36.2	[26.2–47.6]	180
KwaZulu-Natal	6.72	[6.03–7.41]	16.1	[10.0–24.8]	33.8	[28.4–39.6]	50.1	[41.7–58.6]	468
North West	7.11	[6.54–7.69]	18.8	[13.5–25.4]	22.5	[17.1–29.2]	58.7	[50.2–66.6]	302
Gauteng	6.81	[6.37–7.25]	19.5	[14.4–26.0]	26.2	[20.5–32.8]	54.3	[46.8–61.5]	369
Mpumalanga	5.92	[5.32–6.53]	26.8	[19.3–35.9]	35.7	[28.5–43.6]	37.5	[29.5–46.2]	222
Limpopo	6.32	[5.61–7.03]	20.4	[12.9–30.7]	39.3	[31.1–48.2]	40.3	[30.5–50.8]	221
Race									
African	6.69	[6.43–6.94]	18.5	[15.9–21.4]	31.2	[28.5–34.1]	50.3	[46.7–53.9]	1 823
White	*	*	*	*	*	*	*	*	53
Coloured	6.92	[6.44–7.4]	19.2	[14.9–24.5]	25.1	[20.6–30.2]	55.7	[49.0–62.2]	491
Asian/Indian	6.97	[5.44–8.5]	16.4	[6.5–35.6]	27.6	[14.7–45.9]	56.0	[35.6–74.5]	121
Total	6.71	[6.48–6.94]	18.8	[16.3–21.6]	30.2	[27.7–32.8]	51.0	[47.7–54.2]	2 578

95% CI: 95% confidence interval

** Too few observations to record reliably*

*The behaviour score was based on 10 questions relating to reported ability to change behaviour, 'if you had to, could you…'

1 put less margarine on your bread
2 eat fewer chips
3 buy fruit instead of chips
4 put less sugar in your tea or coffee
5 put less sugar in your cereal/porridge
6 eat sweets less often
7 drink cool drinks less often
8 eat brown bread instead of white bread
9 eat more vegetables
10 eat more fruit.

(51%) achieved a high score, 30.2% achieved a medium score, and 18.8% achieved a low score (Table 3.8.4.1). There were no significant differences by sex, locality and race of children.

Mean score of children in Northern Cape was significantly higher (7.18%) compared to Mpumalanga (5.92%), but similar to other provinces. There were no significant differences between provinces for low dietary behaviour change scores. Free State had a significantly medium dietary behaviour change score (44.8%) compared to Western Cape, Eastern Cape, North West and Gauteng (22.0%, 26.8%, 22.5% and 26.2%, respectively); Limpopo also showed higher medium behaviour scores (39.3%) than the Western Cape (22%). Western Cape had a significantly high dietary behaviour change score (59.4%) compared to Free State (36.2%) and Mpumalanga (37.5%); and Eastern Cape (54.8%) scored higher than Free State (36.2%) and Mpumalanga (37.5%).

3.8.5 Dietary practices

Appropriate dietary practices are crucial in contributing to sound nutrition.

Breakfast

Children's behaviour regarding crucial meals such as breakfast and frequency of eating breakfast has public health and developmental consequences. In South Africa, maize meal and bread are staple foods while maize meal porridge, bread and cereals are commonly eaten for breakfast. The Department of Health enacted the mandatory fortification legislation and regulations for fortification of maize meal and wheat flour to support nutrient intake, an intervention that Steyn, Nel and Labadarios (2008) reported as yielding significant changes in the micronutrient intake of children who eat fortified staple foods. The importance of the home environment in supporting breakfast consumption habits of family members, especially children cannot be overemphasised.

Results

Overall, more than two-thirds of children (68.4%) indicated that they ate breakfast before school and 19% indicated that they did not eat breakfast before school (Table 3.8.5.1). The majority of children (86.1% and 89.3%) indicated that they believed it was important to have breakfast because it helped them concentrate better at school and because it helped to give them energy for the day, respectively. There were no significant differences by sex and locality.

By provincial analysis, children in Western Cape and Eastern Cape were significantly more likely (82% and 81.9%, respectively) to eat breakfast compared to those in North West (55.1%), Gauteng (59.8%) and Limpopo (52.5%). Children in Limpopo were least likely (30.3%) to eat breakfast when compared with children in Western Cape (11.2%) and Eastern Cape (9.8%).

More than three-quarters (77.3%) of children in North West indicated that having breakfast is important because it helped them to concentrate at school; however, this was significantly lower than children in Western Cape (91.5%), Eastern Cape (92.7%) and KwaZulu-Natal (89.9%). Children in Limpopo (14.7%) and North West (14%) were significantly less likely to believe that breakfast was important because it helped them to concentrate at school than children in Eastern Cape (4.6%).

Children in Eastern Cape were more likely (95.1%) to believe that breakfast was important because it helped to give them energy for the day compared with children in Free State

(87%), North West (85%), Gauteng (85.2%) and Limpopo (85.9%). Children in Gauteng (11.9%) and North West (9.6%) were least likely to believe that breakfast was important because it helped to give them energy for the day than children in Eastern Cape (2.7%).

There were no significant racial differences in children who indicated that they did/did not eat breakfast before school. There was, however, a significant difference between black African and Indian children who believed and did not believe that breakfast was important because it helped them to concentrate at school. Significantly more Indian children (97.3%) believed that breakfast was important and fewer Indian children (2.1%) believed that it was not important compared to black African children, 84.8% and 11.4%, respectively.

Table 3.8.5.1: Percentage of children aged 10–14 years who had breakfast at home by sex, locality, province and race, South Africa 2012

Background characteristics	Eat breakfast							Believe it is important to have breakfast because it helps them to concentrate better at school	
	Yes		No		Sometimes		Total	Yes	
	%	95% CI	%	95% CI	%	95% CI	n	%	95% CI
Sex									
Male	69.9	[65.0–74.4]	17.6	[14.3–21.6]	12.5	[9.8–15.9]	1 123	84.8	[81.5–87.6]
Female	66.9	[63.0–70.5]	20.4	[17.4–23.7]	12.7	[10.1–16.0]	1 202	87.3	[84.5–89.7]
Locality									
Urban formal	67.8	[61.8–73.2]	18.0	[13.8–23.1]	14.2	[11.0–18.2]	1 082	86.1	[81.5–89.7]
Urban informal	67.5	[59.0–75.0]	17.2	[12.0–24.1]	15.2	[10.6–21.5]	292	87.1	[80.5–91.6]
Rural formal	67.5	[60.0–74.2]	18.7	[14.4–23.9]	13.8	[9.1–20.4]	327	83.1	[75.9–88.5]
Rural informal	69.5	[64.6–74.0]	20.7	[17.2–24.8]	9.8	[6.8–13.9]	702	86.4	[82.8–89.4]
Province									
Western Cape	82.0	[75.9–86.9]	11.2	[7.5–16.5]	6.7	[3.8–11.6]	285	91.5	[86.8–94.6]
Eastern Cape	81.9	[75.8–86.8]	9.8	[6.5–14.6]	8.3	[4.8–13.8]	319	92.7	[88.2–95.5]
Northern Cape	64.2	[47.4–78.2]	26.2	[12.0–48.1]	9.6	[5.0–17.4]	154	83.3	[66.1–92.7]
Free State	69.1	[60.3–76.8]	22.4	[16.9–29.1]	8.4	[4.4–15.5]	173	85.2	[78.8–89.9]
KwaZulu-Natal	77.2	[71.1–82.3]	17.6	[12.7–23.9]	5.2	[2.8–9.5]	417	89.9	[85.3–93.2]
North West	55.1	[47.2–62.7]	22.9	[18.2–28.5]	22.0	[16.3–28.9]	288	77.3	[69.9–83.4]
Gauteng	59.8	[50.5–68.3]	20.2	[13.8–28.5]	20.1	[15.2–25.9]	349	83.0	[75.0–88.8]
Mpumalanga	71.0	[63.0–77.9]	20.0	[13.8–28.0]	9.0	[4.6–16.8]	202	87.3	[80.3–92.1]
Limpopo	52.5	[42.9–62.0]	30.3	[22.3–39.7]	17.2	[10.0–28.1]	216	80.0	[72.3–86.0]
Race									
African	66.8	[63.1–70.3]	20.5	[17.7–23.7]	12.7	[10.5–15.4]	1 711	84.8	[82.0–87.3]
White	*	*	*	*	*	*	*	*	*
Coloured	73.8	[67.2–79.5]	13.5	[9.6–18.6]	12.7	[8.9–17.8]	449	89.5	[84.2–93.2]
Asian/Indian	64.2	[34.9–85.7]	9.0	[4.2–18.2]	26.8	[6.9–64.4]	108	97.3	[92.5–99.1]
Total	68.4	[65.0–71.5]	19.0	[16.5–21.8]	12.6	[10.6–15.0]	2 403	86.1	[83.6–88.2]

95% CI: 95% confidence interval

** Too few observations to record reliably*

Reasons for not having breakfast at home

Unlike midday meals which school children routinely have away from home, breakfast is primarily eaten at home. Parents and caregivers have the opportunity to influence breakfast consumption by ensuring the availability of food and being role models. However, several socioe-conomic and lifestyle factors influence whether older children (10–14 years of age) have breakfast regularly or not.

Possible reasons for not having breakfast investigated in this ssurvey included, children not being able to make their own breakfast, not being able to get up early enough to have breakfast at home, people at home do not eat breakfast, not being hungry early in the morning and not having food in the house to eat for breakfast.

					Believe it is important to have breakfast because it helps to give them energy for the day						
No		Sometimes		Total	Yes		No		Sometimes		Total
%	95% CI	%	95% CI	n	%	95% CI	%	95% CI	%	95% CI	n
11.1	[8.6–14.2]	4.1	[2.8–5.9]	1 126	87.9	[84.6–90.5]	8.8	[6.5–11.8]	3.3	[2.3–4.8]	1 123
9.9	[7.8–12.6]	2.7	[1.8–4.1]	1 205	90.7	[88.0–92.8]	6.9	[5.3–9.1]	2.4	[1.5–3.8]	1 203
10.9	[7.6–15.2]	3.0	[1.7–5.2]	1 088	88.5	[84.4–91.6]	8.6	[5.9–12.5]	2.9	[1.8–4.8]	1 085
8.5	[5.2–13.7]	4.4	[2.3–8.3]	295	88.1	[81.3–92.7]	8.8	[5.4–13.9]	3.1	[1.5–6.4]	293
12.1	[8.1–17.6]	4.8	[2.9–8.0]	324	87.6	[81.7–91.8]	9.0	[5.6–14.1]	3.4	[1.8–6.4]	325
10.2	[7.7–13.4]	3.4	[2.2–5.3]	702	90.9	[88.1–93.1]	6.5	[4.9–8.6]	2.6	[1.5–4.5]	701
7.3	[4.4–12.0]	1.1	[0.4–3.0]	285	93.8	[89.6–96.3]	5.7	[3.3–9.7]	0.5	[0.1–2.0]	285
4.6	[2.3–8.8]	2.8	[1.3–5.9]	319	95.1	[91.2–97.4]	2.7	[1.4–4.9]	2.2	[0.9–5.2]	318
13.6	[4.6–33.7]	3.2	[1.2–7.8]	154	83.5	[66.2–92.9]	12.1	[3.6–33.5]	4.4	[1.9–9.9]	154
11.8	[7.9–17.2]	3.1	[1.1–8.0]	174	87.0	[81.3–91.1]	7.9	[4.3–14.0]	5.1	[2.4–10.4]	173
8.4	[5.6–12.5]	1.6	[0.7–3.7]	421	92.1	[88.8–94.5]	7.1	[4.8–10.3]	0.9	[0.2–3.7]	419
14.0	[10.1–19.0]	8.7	[5.0–14.7]	286	85.0	[78.8–89.7]	9.6	[6.6–13.9]	5.3	[2.8–9.8]	287
13.3	[8.1–21.2]	3.7	[1.7–7.5]	353	85.2	[78.0–90.3]	11.9	[7.3–18.7]	3.0	[1.4–6.1]	352
9.6	[5.3–16.8]	3.1	[1.2–7.8]	202	92.5	[87.4–95.7]	5.2	[2.8–9.6]	2.2	[0.8–5.9]	200
14.7	[9.4–22.3]	5.3	[2.9–9.6]	215	85.9	[79.5–90.6]	7.9	[4.8–12.8]	6.1	[3.2–11.3]	216
11.4	[9.2–14.0]	3.8	[2.8–5.1]	1 714	88.5	[86.1–90.6]	8.3	[6.5–10.5]	3.2	[2.3–4.4]	1 709
*	*	*	*	*	*	*	*	*	*	*	52
8.3	[4.8–14.0]	2.2	[1.1–4.2]	449	91.5	[86.2–94.9]	6.7	[3.8–11.6]	1.8	[0.8–3.7]	449
2.1	[0.6–6.8]	0.6	[0.1–4.5]	110	96.3	[90.9–98.5]	3.7	[1.5–9.1]	0.0		110
10.5	[8.6–12.8]	3.4	[2.6–4.6]	2 409	89.3	[87.1–91.1]	7.9	[6.3–9.8]	2.9	[2.1–3.9]	2 404

Results

The most common reason indicated by the participants was 'not being hungry early in the morning' (39.2%) (Table 3.8.5.2). This was followed by not having enough food in the house (33.9%), people at home do not have breakfast (33%), cannot get up early enough (19.2%), and lastly children could not make their own breakfast (15.3%). Males and females did not give different reasons for not having breakfast.

In terms of locality, there was a significant difference between urban informal children who were more likely (47%) to not have breakfast because there was no food in the house than urban formal children (27.7%). By provincial analysis, children in Free State were more likely (22.5%) than children in Western Cape (8.5%) to not be able to make their own breakfast. Children in Free State and Limpopo were more likely (33.7% and 26.4%, respectively) to not be able to get up early enough to have breakfast at home than children in Eastern Cape (12.4%). More than a third of children (32.1% to 44.7%) in KwaZulu-Natal, North West, Gauteng, Mpumalanga and Limpopo were more likely to indicate people at home not eating breakfast as a reason for not having breakfast than children in Western Cape (16.8%). Similarly, almost half the children (46.1% to 50.7%) in North West, Gauteng, Mpumalanga and Limpopo were more likely to indicate 'not being hungry early in the morning' than children in Western Cape (24.8%). Overall, one third of children (37% to 44.3%) in Eastern Cape, North West, Mpumalanga and Limpopo were more likely to indicate 'not having food in the house to eat for breakfast' compared with children in Western Cape (19.9%).

There were no significant differences by race for children who indicated that they could not get up early enough to have breakfast at home and those who were not hungry early in the morning. Indian children were least likely (2.7%) to indicate that they could not make their own breakfast compared to all other race groups (12.1% coloured children, 15.0% black African children and 27% of white children). Black African children were significantly more likely (34.6%) to indicate that people at home not eating breakfast was the reason when compared with Indian children (15.2%). There were also significant differences by race for children who indicated that there was no food in the house to eat for breakfast. Black African children were significantly more likely (37.6%) to indicate that there was no food in the house to eat for breakfast than children of all race groups. Indian children were significantly less likely (7.7%) compared with both coloureds (21.1%) and black Africans (37.6%) to indicate that there was no food in the house to eat for breakfast.

Lunch boxes

The eating behaviour of school children is shaped in different settings including school, but the home environment can influence food consumed at school if children take lunch boxes to school. A packed lunch is a common practice among school children. However, factors that influence lunch box practices can range from aesthetic concerns to real socio-economic barriers. They include peer pressure, children's perceptions of what is 'better food', food availability and caregivers' support at home, time required to pack food and availability of affordable foods from school tuckshops. In schools where children benefit from the National School Feeding Programme (NSFP) children have the option of obtaining food on most school days. Also of importance was to determine the amount of money children take to school which in itself may shape their eating habits, especially if schools do not serve government funded lunch and children do not take packed lunch boxes to school. Pocket money influences dietary intake during most parts of the week

Table 3.8.5.2: Possible reason(s) why it would be difficult for children aged 10–14 years not to have breakfast at home by sex, locality, province and race, South Africa 2012

Background characteristics	Cannot make your own breakfast			Cannot get up early enough to have breakfast at home			People at home do not eat breakfast			Not hungry early in the morning			No food in the house to eat for breakfast		
	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n
Sex															
Male	17.5	[14.1–21.5]	1 125	21.0	[17.7–24.6]	1 128	33.2	[29.7–37.0]	1 125	38.2	[34.2–42.5]	1 124	35.6	[31.5–40.0]	1 126
Female	13.1	[10.5–16.1]	1 204	17.4	[14.8–20.3]	1 202	32.7	[29.0–36.7]	1 204	40.1	[36.1–44.2]	1 206	32.2	[28.1–36.6]	1 198
Locality															
Urban formal	14.4	[10.3–19.9]	1 085	18.8	[15.1–23.2]	1 088	31.6	[27.5–36.0]	1 086	40.5	[35.7–45.4]	1 086	27.7	[22.7–33.3]	1 082
Urban informal	16.8	[11.8–23.2]	295	17.9	[12.8–24.5]	294	32.4	[24.6–41.3]	294	35.6	[29.5–42.1]	295	47.0	[37.0–57.3]	291
Rural formal	19.5	[14.4–25.9]	324	20.9	[16.6–26.1]	325	38.8	[29.0–49.7]	326	39.6	[31.2–48.6]	326	38.8	[30.6–47.8]	324
Rural informal	15.0	[11.9–18.7]	703	19.6	[16.3–23.2]	701	33.6	[29.2–38.4]	701	38.4	[33.1–44.0]	701	37.2	[32.3–42.5]	705
Province															
Western Cape	8.5	[5.7–12.6]	285	16.1	[11.7–21.8]	285	16.8	[11.5–23.9]	285	24.8	[19.7–30.6]	285	19.9	[13.7–28.0]	277
Eastern Cape	15.5	[10.2–22.9]	319	12.4	[7.9–18.9]	318	28.2	[23.1–34.0]	318	28.2	[22.7–34.4]	319	37.0	[30.5–44.0]	321
Northern Cape	27.1	[12.3–49.4]	154	26.8	[15.5–42.2]	154	30.8	[16.7–49.7]	154	39.8	[25.3–56.4]	154	39.8	[19.5–64.4]	153
Free State	22.5	[15.9–30.9]	173	33.7	[24.2–44.7]	173	29.7	[23.6–36.6]	173	24.9	[19.0–31.8]	174	32.9	[26.4–40.1]	176
KwaZulu-Natal	14.0	[9.5–20.3]	420	18.4	[13.9–23.9]	421	32.1	[26.0–38.9]	420	33.4	[27.1–40.3]	420	29.2	[23.5–35.6]	422
North West	15.6	[10.9–21.7]	287	17.3	[11.7–24.9]	287	44.7	[35.6–54.3]	287	49.6	[42.2–57.0]	286	40.2	[31.4–49.8]	287
Gauteng	18.2	[11.6–27.3]	352	18.8	[13.6–25.3]	353	38.5	[32.1–45.3]	353	49.4	[42.6–56.3]	353	32.5	[23.6–42.9]	352
Mpumalanga	12.3	[7.6–19.1]	201	16.8	[10.5–25.7]	201	35.9	[27.7–44.9]	201	50.7	[39.1–62.2]	201	44.3	[32.0–57.2]	200
Limpopo	11.8	[8.0–17.1]	216	26.4	[20.8–32.8]	216	32.9	[24.0–43.3]	216	46.1	[34.0–58.8]	216	42.7	[34.1–51.7]	214
Race															
African	15.0	[12.6–17.7]	1 713	20.4	[17.9–23.1]	1 713	34.6	[31.6–37.7]	1 712	40.7	[37.2–44.3]	1 713	37.6	[34.0–41.4]	1 712
White	*	*	*	*	*	*	*	*	*	*	*	*	*	*	51
Coloured	12.1	[8.8–16.6]	448	16.8	[12.6–21.9]	449	21.5	[16.2–28.0]	449	33.4	[27.9–39.4]	449	21.1	[16.7–26.2]	444
Asian/Indian	2.7	[1.0–7.1]	110	10.8	[5.1–21.2]	110	15.2	[7.7–27.7]	110	24.1	[13.7–38.8]	110	7.7	[3.5–16.2]	111
Total	15.3	[12.8–18.1]	2 407	19.2	[16.9–21.6]	2 408	33.0	[30.2–35.9]	2 407	39.2	[36.1–42.3]	2 408	33.9	[30.6–37.3]	2 402

95% CI: 95% confidence interval

** Too few observations to record reliably*

and because many children prefer to eat what they like – high energy, fat, sugar and salt food, their money is mostly spent on these items – and not much is spent on fruit or healthy snacks.

Results

More than half (51.1%) the children 10–14 years of age indicated that they did not take a lunch box to school and only 37.6% of children indicated that they took a lunch box to school (Table 3.8.5.3). There were no differences between males and females in taking a lunch box to school. However, children in rural informal setting were significantly less likely (25.3%) to take lunch boxes to school than children in urban formal (47.6%) and urban informal (40%) settings.

Provincial differences in taking lunch boxes were evident. Children in the Western Cape were significantly more likely (64.6%) to take a lunch box to school than children in most other provinces, including Eastern Cape, Free State, KwaZulu-Natal, North West, Mpumalanga and Limpopo (range 29.7% to 34.6%). Furthermore, children in KwaZulu-Natal were significantly less likely (25.3%) than children in both Gauteng (48.9%) and Western Cape (64.6%) to take lunch boxes to school.

Black African children were less likely (32.2%) to take a lunch box to school compared to children in all other race groups where the percentages ranged from 53.2% to 83.5%. Coloured children were also significantly less likely (53.2%) to take a lunch box to school compared with Indian children (83.5%).

Responses in relation to possible reasons why it would be difficult for children to take a lunch box to school were also elicited. These reasons included other children wanting their food, food at school is enough for the whole day, nothing at home to put in a lunch box, no one at home to help make a lunch box, and not having a nice container to put the lunch in.

Overall, the most common reason indicated was that the food at school was enough for the whole day (37.2%), followed by nothing at home to put in the lunch box (29.8%), no one at home to help make lunch (18.3%), other children will want their food (18%) and lastly not having a nice container (17.1%) (Table 3.8.5.4). There were differences between males and females in reasons given for not taking a lunch box to school. In terms of locality, children in urban informal areas were significantly more likely (39.8%) to not have anything at home to put in a lunch box than urban formal residents (24.6%).

There were significant differences between provinces for children who indicated that the food at school was enough for the whole day and children who indicated they had nothing at home to put in their lunch boxes. Limpopo children were significantly more likely (53.4%) compared with all other provinces (range 26.8% to 37.6%) to indicate that the food at school was enough for the whole day, except Northern Cape, KwaZulu-Natal and Mpumalanga. Children in Eastern Cape, KwaZulu-Natal, North West and Limpopo were significantly more likely, with their rates ranging from 30% to 36%, to indicate that they had nothing at home to put in their lunch boxes compared with children in Western Cape (15.6%).

Black African children were significantly more likely (39.2%) to indicate that the food at school was enough for the whole day than Indian children (10.5%) but were similar to other races. They were also significantly more likely (18.5%) to state that they did not have a nice container to put their lunch in compared to Indian children (2.4%). Black African children were also more likely (32.6%) to indicate that they had nothing at home to put in the lunch box than both coloured (17.3%) and Indian (7.2%) children. Similarly, black African children were significantly more likely (18.5%) than Indian children (2.4%) to indicate that there was no one at home to help them pack lunch.

Table 3.8.5.5 shows responses to the number of children who took money to school, as well as the frequency with which money was taken to school.

In terms of frequency and amount of money taken to school, overall, 51.3% of children indicated that they took money to school, 33.2% indicated that they did not take money to school and 15.5% indicated that they sometimes took money to school (Table 3.8.5.5).

Table 3.8.5.3: Number of children aged 10–14 years who took a lunch box to school by sex, locality, province and race, South Africa 2012

Background characteristics	Take a lunch box to school						Total
	Yes		No		Sometimes		Total
	%	95% CI	%	95% CI	%	95% CI	n
Sex							
Male	35.1	[30.6–39.9]	53.5	[48.4–58.5]	11.5	[9.1–14.4]	1 128
Female	40.0	[35.6–44.6]	48.7	[44.1–53.3]	11.3	[8.7–14.4]	1 205
Locality							
Urban formal	47.6	[41.1–54.3]	40.4	[33.7–47.5]	12.0	[9.1–15.5]	1 090
Urban informal	40.0	[32.9–47.5]	44.7	[36.1–53.6]	15.3	[9.9–23.0]	295
Rural formal	34.6	[25.1–45.5]	58.8	[48.8–68.2]	6.6	[3.8–11.1]	326
Rural informal	25.3	[21.0–30.1]	64.1	[59.0–68.8]	10.6	[7.6–14.8]	701
Province							
Western Cape	64.6	[56.2–72.2]	30.2	[23.4–38.1]	5.2	[3.0–8.7]	285
Eastern Cape	34.6	[27.5–42.5]	54.5	[46.1–62.6]	10.9	[6.8–17.1]	321
Northern Cape	40.3	[25.7–56.8]	52.1	[37.3–66.4]	7.7	[3.8–14.8]	154
Free State	29.7	[21.0–40.1]	61.5	[51.7–70.5]	8.8	[4.6–16.2]	176
KwaZulu-Natal	25.3	[18.6–33.5]	69.8	[60.9–77.4]	4.9	[2.8–8.4]	423
North West	31.0	[23.2–40.1]	48.3	[40.3–56.4]	20.7	[15.0–27.9]	285
Gauteng	48.9	[39.2–58.7]	35.0	[25.6–45.7]	16.1	[11.4–22.1]	351
Mpumalanga	33.7	[23.2–46.1]	56.8	[43.2–69.4]	9.4	[4.6–18.4]	202
Limpopo	28.3	[20.1–38.3]	57.4	[48.9–65.5]	14.3	[7.5–25.5]	215
Race							
African	32.2	[28.4–36.2]	55.9	[51.5–60.2]	11.9	[9.8–14.4]	1 714
White	*	*	*	*	*	*	52
Coloured	53.2	[46.7–59.5]	36.3	[30.4–42.8]	10.5	[7.4–14.6]	450
Asian/Indian	83.5	[69.9–91.7]	11.6	[5.3–23.4]	4.9	[2.0–11.8]	111
Total	37.6	[34.0–41.3]	51.1	[47.2–54.9]	11.4	[9.4–13.6]	2 412

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.8.5.4: Possible reason(s) why it would be difficult for children aged 10–14 years not to take a lunch box to school by sex, locality, province and race, South Africa 2012

Background characteristics	Other children will want their food			The food at school is enough for the whole day			Nothing at home to put in the lunch box			No-one at home to help make a lunch box			Do not have a nice container to put it in		
	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n
Sex															
Male	18.8	[15.9–22.2]	1 124	37.1	[33.0–41.5]	1 117	30.8	[26.9–35.1]	1 116	19.6	[16.2–23.6]	1 119	16.8	[14.1–20.0]	1 121
Female	17.1	[14.2–20.4]	1 204	37.2	[33.0–41.6]	1 204	28.8	[25.1–32.8]	1 202	17.0	[14.2–20.3]	1 204	17.3	[14.2–20.9]	1 202
Locality															
Urban formal	17.8	[14.1–22.3]	1 086	32.3	[27.0–38.0]	1 081	24.6	[19.2–30.9]	1 082	18.8	[14.4–24.2]	1 085	16.4	[12.8–20.8]	1 081
Urban informal	19.5	[14.0–26.5]	294	38.4	[30.1–47.5]	294	39.8	[31.4–48.7]	292	19.8	[15.0–25.7]	294	18.3	[13.6–24.1]	295
Rural formal	20.7	[14.7–28.5]	326	41.3	[32.0–51.4]	326	33.7	[26.3–42.0]	324	20.9	[15.3–27.9]	325	18.3	[12.6–25.9]	324
Rural informal	17.1	[13.9–20.9]	700	42.0	[36.3–47.8]	698	33.0	[28.4–37.9]	698	16.8	[13.5–20.7]	698	17.3	[14.1–21.1]	699
Province															
Western Cape	19.5	[13.7–26.9]	282	27.3	[21.1–34.6]	283	15.6	[10.5–22.6]	281	11.8	[7.9–17.3]	283	11.3	[7.5–16.8]	283
Eastern Cape	18.3	[13.5–24.3]	319	32.4	[24.3–41.7]	320	34.7	[28.3–41.7]	320	18.3	[13.3–24.7]	320	16.9	[12.2–23.0]	321
Northern Cape	29.1	[14.0–51.0]	153	40.5	[25.3–57.7]	154	35.7	[15.8–62.2]	154	17.3	[7.6–34.8]	154	26.2	[8.1–58.9]	153
Free State	15.3	[9.5–23.7]	176	31.5	[23.3–40.9]	175	24.5	[16.5–34.8]	175	11.5	[7.6–17.1]	176	7.5	[3.6–14.9]	176
KwaZulu-Natal	14.8	[10.9–19.8]	421	41.0	[33.1–49.4]	419	30.0	[23.5–37.3]	419	19.7	[13.9–27.1]	419	19.8	[14.9–25.9]	418
North West	21.9	[15.0–30.8]	286	26.8	[19.3–36.0]	283	32.0	[23.5–41.8]	283	22.1	[15.9–29.9]	284	16.7	[10.7–25.1]	283
Gauteng	19.2	[13.3–26.8]	352	37.6	[29.1–47.0]	349	29.0	[20.2–39.7]	347	19.8	[13.2–28.6]	349	16.9	[11.9–23.3]	348
Mpumalanga	18.5	[11.9–27.6]	202	35.6	[25.6–46.9]	202	30.7	[22.1–40.8]	201	20.4	[14.0–28.8]	202	21.2	[14.5–30.1]	202
Limpopo	16.1	[11.4–22.1]	215	53.4	[45.4–61.2]	214	36.0	[28.7–43.9]	216	17.6	[13.0–23.4]	215	19.1	[13.5–26.3]	215
Race															
African	18.1	[15.6–20.9]	1 711	39.2	[35.4–43.1]	1 707	32.6	[29.1–36.4]	1 703	19.7	[16.9–22.8]	1 706	18.5	[16.1–21.3]	1 708
White	*	*	*	*	*	*	*	*	*	*	*	*	*	*	52
Coloured	20.5	[15.7–26.4]	448	29.8	[24.3–36.0]	447	17.3	[13.0–22.5]	446	14.3	[10.3–19.5]	448	12.9	[9.2–17.9]	446
Asian/Indian	8.1	[3.5–17.5]	111	10.5	[4.3–23.1]	109	7.2	[2.7–18.0]	111	5.0	[1.5–15.2]	111	2.4	[0.8–6.7]	111
Total	18.0	[15.7–20.5]	2 406	37.2	[33.8–40.7]	2 399	29.8	[26.6–33.2]	2 396	18.3	[15.8–21.2]	2 402	17.1	[14.9–19.5]	2 399

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.8.5.5: Percentage of children aged 10–14 years who took money to school by sex, locality, province and race, South Africa 2012

Background characteristics	Take money to school							Frequency				
	Yes		No		Sometimes		Total	Every day		2–3 times a week		Total
	%	95% CI	%	95% CI	%	95% CI	n	%	95% CI	%	95% CI	n
Sex												
Male	50.2	[45.1–55.3]	35.3	[30.6–40.3]	14.5	[12.0–17.4]	1,123	49.1	[43.2–54.9]	50.9	[45.1–56.8]	680
Female	52.4	[47.6–57.2]	31.1	[26.9–35.6]	16.5	[13.5–19.9]	1,199	48.2	[43.2–53.2]	51.8	[46.8–56.8]	774
Locality												
Urban formal	50.8	[44.2–57.3]	31.4	[25.8–37.6]	17.9	[14.4–21.9]	1 087	51.2	[43.8–58.4]	48.8	[41.6–56.2]	710
Urban informal	44.5	[33.0–56.5]	32.2	[23.5–42.2]	23.4	[16.4–32.2]	292	39.8	[29.2–51.5]	60.2	[48.5–70.8]	189
Rural formal	30.3	[21.1–41.5]	56.5	[43.5–68.7]	13.1	[7.8–21.4]	323	36.4	[26.0–48.3]	63.6	[51.7–74.0]	134
Rural informal	58.0	[51.4–64.3]	30.8	[24.9–37.3]	11.2	[8.6–14.4]	699	49.2	[43.0–55.4]	50.8	[44.6–57.0]	466
Province												
Western Cape	42.4	[33.4–52.0]	35.4	[26.0–46.2]	22.1	[15.9–30.0]	285	26.2	[19.9–33.6]	73.8	[66.4–80.1]	188
Eastern Cape	40.7	[32.1–50.0]	45.3	[35.4–55.6]	13.9	[9.8–19.5]	320	30.2	[22.4–39.4]	69.8	[60.6–77.6]	185
Northern Cape	44.8	[34.5–55.6]	34.9	[23.2–48.7]	20.3	[12.1–32.1]	153	31.3	[19.9–45.6]	68.7	[54.4–80.1]	101
Free State	61.4	[49.7–71.8]	26.3	[17.3–37.8]	12.3	[7.5–19.7]	176	60.0	[46.1–72.4]	40.0	[27.6–53.9]	131
KwaZulu-Natal	71.6	[64.6–77.8]	17.0	[12.6–22.5]	11.4	[7.5–16.9]	422	50.3	[42.8–57.9]	49.7	[42.1–57.2]	322
North West	31.4	[22.9–41.3]	52.5	[41.5–63.2]	16.2	[10.8–23.6]	285	46.1	[33.2–59.6]	53.9	[40.4–66.8]	97
Gauteng	40.9	[31.1–51.4]	38.6	[29.1–49.1]	20.5	[15.3–26.9]	346	53.2	[39.3–66.6]	46.8	[33.4–60.7]	187
Mpumalanga	47.9	[34.3–61.8]	36.6	[26.0–48.8]	15.4	[9.9–23.3]	198	60.8	[49.7–70.8]	39.2	[29.2–50.3]	125
Limpopo	68.7	[56.2–78.9]	21.7	[12.7–34.4]	9.7	[5.2–17.3]	216	62.0	[51.8–71.2]	38.0	[28.8–48.2]	163
Race												
African	52.7	[48.1–57.3]	32.8	[28.6–37.4]	14.5	[12.3–16.9]	1 706	50.2	[45.5–54.8]	49.8	[45.2–54.5]	1 049
White	*	*	*	*	*	*	*	*	*	*	*	33
Coloured	42.7	[36.8–48.7]	31.1	[24.9–38.1]	26.2	[20.2–33.3]	447	28.2	[22.2–35.2]	71.8	[64.8–77.8]	298
Asian/Indian	37.6	[21.6–56.9]	41.3	[19.3–67.4]	21.1	[11.2–36.2]	111	27.3	[17.6–39.9]	72.7	[60.1–82.4]	70
Total	51.3	[47.2–55.4]	33.2	[29.4–37.1]	15.5	[13.4–17.9]	2 401	48.6	[44.2–53.0]	51.4	[47.0–55.8]	1 499

95% CI: 95% confidence interval

** Too few observations to record reliably*

Of those who took money to school, 48.6% did it every day and 51.4% took money to school two or three times a week. Males and females were equally more likely to take money to school and with the same frequency. Children in rural formal settings were less likely (30.3%) to take money to school than children in both urban formal (50.8%) and rural informal (58%) settings.

There were provincial differences in the behaviour of children who took money to school. Children in KwaZulu-Natal were significantly more likely (71.6%) to take money to school compared to children in Eastern Cape, Northern Cape, North West, Gauteng and Mpumalanga whose rates ranged between 31.4% and 47.9%. Conversely, North West children were significantly least likely to take money to school (31.4%) compared to Free State, KwaZulu-Natal and Limpopo children with their rates ranging from 61.4 to 71.6%. Children in Limpopo were more likely (62.0%) to take money to school every day than children in Western Cape, Eastern Cape and Northern Cape (range 26.2% to 31.3%), while children in Western Cape were more likely (73.8%) to take money to school two or three times a week compared to those in Free State, KwaZulu-Natal and Gauteng (range 40.0% to 49.7%).

There were no significant differences by race group among children who took money to school. However, black African children were more likely (50.2%) to take money to school every day than coloured (28.2%) and Indian (27.3%) children.

With respect to the amount of money that children took to school, overall, the mean amount of money children took to school on any given day was R5.75 (Table 3.8.5.6). The majority of children (76.5%) took R0–R5 to school, followed by those who took R5.50–R10 (16.2%) and those who took R11–20 were 5%. Only 2.4% of children took more than R20 to school on any given day. There were no differences between males and females. However, there were significant differences between localities in the mean amount of money children took to school. Children from urban formal areas had significantly higher mean amount of money taken to school (R7.64) compared with other localities ranging from R3.83 to R4.58.

Children in urban formal settings were less likely (62.1%) to take R0–R5 to school compared with all other localities, with their rates ranging from 85.2% to 91.2%. Conversely, children in urban formal settings were significantly more likely (24.1%) to take R5.50–R10 to school than children in rural informal settings (7.9%), as well as significantly more likely (9.6%) to take R11–R20 than children in urban informal settings (1%); while children in rural formal settings were significantly more likely (2.7%) to take R11–R20 than children in rural informal settings (0.3%).

Children in Gauteng were more likely to take more money (R8.88) to school, than children in other provinces whose mean amounts ranged from R3.87 to R4.69, with the exception of Western Cape (R7.09) and Free State (R6.26). Additionally, Limpopo children were significantly more likely to take less money (R3.87) to school than children in Western Cape. Children in Gauteng were significantly less likely (50.1%) to take R0–R5 to school compared to all seven provinces with their rates ranging from 74.5% to 90%, except North West (71.5%); however, children in Eastern Cape were significantly more likely (90%) to take R0–R5 to school with them compared to children in Gauteng (50.1%). Conversely, children in Gauteng were significantly more likely (30.9%) to take R5.50–R10 to school than children in Eastern Cape (6.5%), KwaZulu-Natal (10.3%), Mpumalanga (8.3%) and Limpopo (12.6%). Children in Eastern Cape were significantly less likely to take the same amount to school than children in North West (28.5%) and Gauteng. Additionally, children in Gauteng were significantly more likely (13.5%) to take R11–R20 to school than children in all provinces

Table 3.8.5.6: Amount of money children aged 10–14 years took to school by sex, locality, province and race, South Africa 2012

Background characteristics	Amount of money taken to school												Total
			R0–R5		R5.50–R10		R11–R20		R21–R40		>R40		
	Mean	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex													
Male	5.49	[4.60–6.38]	76.9	[71.2–81.8]	15.6	[11.9–20.3]	4.6	[2.7–7.7]	1.9	[0.4–8.1]	0.9	[0.3–2.2]	691
Female	5.99	[5.14–6.84]	76.1	[70.8–80.7]	16.7	[12.6–21.8]	5.3	[2.8–9.6]	0.5	[0.1–2.1]	1.5	[0.7–3.3]	777
Locality													
Urban formal	7.64	[6.39–8.90]	62.1	[54.6–69.0]	24.1	[18.4–31.0]	9.6	[6.4–14.2]	2.5	[0.7–7.8]	1.7	[0.7–3.9]	734
Urban informal	4.43	[3.43–5.42]	85.2	[78.7–89.9]	12.5	[8.1–18.8]	1.0	[0.3–4.2]	0.0		1.3	[0.3–5.0]	192
Rural formal	4.58	[2.84–6.32]	87.3	[70.8–95.1]	9.3	[3.5–22.8]	2.7	[0.7–9.4]	0.0		0.7	[0.1–4.7]	134
Rural informal	3.83	[3.13–4.54]	91.2	[87.3–93.9]	7.9	[5.3–11.8]	0.3	[0.1–1.5]	0.0		0.6	[0.2–1.9]	454
Province													
Western Cape	7.09	[4.84–9.33]	74.5	[61.9–84.0]	14.2	[7.3–25.6]	7.3	[2.6–19.1]	1.7	[0.5–5.9]	2.3	[0.4–11.6]	188
Eastern Cape	4.11	[3.13–5.09]	90.0	[81.0–95.0]	6.5	[2.9–13.6]	2.8	[1.0–7.6]	0.0		0.7	[0.2–2.9]	183
Northern Cape	4.69	[3.87–5.50]	80.1	[69.3–87.7]	18.6	[11.0–29.7]	1.3	[0.3–5.1]	0.0		0.0		105
Free State	6.26	[3.45–9.08]	84.1	[69.1–92.6]	7.3	[2.0–23.1]	5.6	[2.0–14.4]	0.1	[0.0–0.7]	3.0	[0.9–9.7]	125
KwaZulu-Natal	4.61	[3.48–5.74]	87.4	[80.3–92.2]	10.3	[5.8–17.5]	1.0	[0.5–2.3]	0.1	[0.0–0.6]	1.2	[0.4–3.2]	318
North West	4.59	[3.89–5.28]	71.5	[53.1–84.8]	28.5	[15.2–46.9]	0.0	[0.0–0.0]	0.0		0.0		102
Gauteng	8.88	[6.79–10.97]	50.1	[39.2–60.9]	30.9	[21.5–42.2]	13.5	[8.0–21.7]	3.8	[0.8–16.4]	1.7	[0.4–6.5]	203
Mpumalanga	4.67	[2.61–6.72]	86.8	[77.9–92.5]	8.3	[4.4–15.2]	2.1	[0.6–7.0]	1.9	[0.3–13.0]	0.8	[0.1–6.0]	124
Limpopo	3.87	[3.22–4.52]	85.9	[78.2–91.1]	12.6	[7.6–20.2]	1.3	[0.4–4.3]	0.1	[0.0–1.0]	0.0		166
Race													
African	4.72	[4.17–5.26]	82.2	[77.8–85.8]	14.3	[11.0–18.4]	2.4	[1.4–4.1]	0.3	[0.1–1.3]	0.8	[0.4–1.9]	1 053
White	*	*	*	*	*	*	*	*	*	*	*	*	36
Coloured	5.99	[5.01–6.97]	75.1	[67.2–81.6]	17.5	[11.7–25.6]	5.4	[2.9–9.9]	1.6	[0.4–5.5]	0.4	[0.1–2.6]	304
Asian/Indian	*	*	*	*	*	*	*	*	*	*	*	*	71
Total	5.75	[5.06–6.44]	76.5	[72.1–80.4]	16.2	[13.0–20.0]	5.0	[3.3–7.3]	1.2	[0.4–3.9]	1.2	[0.6–2.2]	1 514

95% CI: 95% confidence interval

** Too few observations to record reliably*

ranging from 0% to 2.8%, except in Western Cape (7.3%) and Free State (5.6%). By race group analysis, most black African and coloured children were more likely to take R0–R5 to school than they were to take higher amounts to school.

Discussion

Children 10–14 years of age experience changes in interaction patterns with parents and caregivers and their dependence on parental opinions decreases with peer influence becoming prominent. This can lead to changes in social arrangements that usually control eating habits during early childhood. Adolescence is also a crucial developmental phase that is characterised by increased nutrient requirements. It has also been characterised as a time when nutrition interventions are likely to be more effective and to have lasting effect into adulthood, thus preventing both childhood and adulthood obesity (Al–Almaie 2005).

Overall, the findings of the present survey indicate that the majority of the children had a low level of general nutrition knowledge. More than 70% of children achieved low scores and about one in four of the children achieved moderately high scores on items that assessed their knowledge about the nutritional value of different foods and the food groups that should be taken in small amounts in meals. There were differences between provinces, with children in Western Cape showing medium knowledge compared to children in Eastern Cape, Free State and North West. However, children displayed a high level of knowledge regarding healthy food alternatives. More than half (53%) had high scores and 38% had medium scores for being able to distinguish between healthier food alternatives. Children who lived in urban formal settings and in Gauteng were more knowledgeable about healthier food alternatives. To the contrary, children showed lack of knowledge in relation to correctly identifying foods containing healthy fats with a mean score of 5.4 out of a possible 10 points and only 15% who achieved high knowledge scores. Children in urban formal settings, in Western Cape and coloureds were more able to identify foods with healthy fats than children in rural informal areas, Eastern Cape and black Africans, respectively.

Exposure to nutrition information and ensuring that the environments in which children live, work and play support healthy eating habits are protective of children's health and form a crucial part of societal investment in their productivity. The primary school curriculum introduces children in public schools to nutrition information at an early age. However, it is not the only source of information for children. Aggressive advertising usually provides selective messages about the desirability of food that children find in their environments. The fact that children showed high knowledge of alternative foods but very low knowledge of healthy fats could be an indication that they do not have information about the reasons for considering certain foods as unhealthy. Nuanced nutrition education about different types of fats and their dietary value would help reduce this information gap.

Children showed a moderately high score of 6.7 out of a possible 10 points on self-efficacy in relation to their ability to change their dietary behaviour by consuming less fat, sugar, more fibre, fruit and vegetables. More than half of children (51%) achieved a high score with 30% achieving a medium score. Free State had a high prevalence of medium perceived ability scores while Western Cape had high perceived ability scores. Through home, school, media and community influences, children learn what to eat, when and how at a young age and these influences may have lasting effects on their dietary choices (Contento, Balch, Bronner et al. 2007). But families and caregivers may face various socio-economic challenges in maintaining healthy eating behaviours among household members, especially adolescents (Cason 2006; Fulkerson, Neumark-Sztainer & Story 2006).

More than 68% of children reported that they ate breakfast before going to school and 19% stated that they did not eat breakfast. Children in Eastern Cape and Western Cape had a higher prevalence of eating breakfast than children in North West, Gauteng and Limpopo. Black African children and children in Limpopo were more likely than other children to skip breakfast. Studies have found that the rate of skipping breakfast among adolescents is high. Temple, Steyn, Myburgh et al. (2006) found that 22% of South African students, the majority of whom were 12–17 years of age did not have breakfast on school days. Analysis based on the dietary habits and eating practices of a cohort of adolescents 13, 15 and 17 years of age years living in Soweto and Johannesburg in the South African longitudinal Birth to Twenty study (Feeley, Musenge, Pettifor et al. 2012) found that over five years, the frequency of regular breakfast eating during weekdays (three or more times) was highest among the youngest adolescents at 76% and 64% at 15 years of age.

More than 85% of the children believed that breakfast was important because it helped them concentrate better at school and it helped to give them energy. The benefits of children having breakfast regularly have been studied and they include protection from the risk of being overweight (Albertson, Affenito, Bauserman et al. 2009; Barton, Eldridge, Thompson et al. 2005). Maddah (2008) established that among Iranian rural and urban adolescent girls, overweight and obesity were significantly associated with skipping breakfast. For children who attend school, the benefits of having breakfast regularly during weekdays include academic achievement, while not having breakfast negatively affects the dietary intake of children because they tend to replace breakfast with high fat, energy dense and low fibre snack during the day (Vereecken, Ojala & Jordan 2004).

The common reasons for not having breakfast were mostly related to habits and modelling. *Not being hungry early in the morning* (39%) as well as another one third of children (range 32% to 44.7%) in five provinces (KwaZulu-Natal, North West, Gauteng, Mpumalanga and Limpopo) identified *people at home who did not usually have breakfast* as their main reason for not having breakfast. During adolescence, the home and school remain the key settings where dietary patterns such as eating breakfast can be maintained or disrupted and children learn dietary practices from their parents and other family members. Another common reason was not having enough food in the house (33.9%), which was mostly reported by children in urban informal areas and by black African and coloured children. Vereecken, Ojala & Jordan (2004) found that that skipping breakfast was common among young people from the lower socio-economic strata.

More than 50% of the children did not take a lunch box to school as opposed to 37% of children who did. Children who were more likely to report not taking a lunch box to school lived in rural areas, KwaZulu-Natal and Free State, or they were black African children. Studies conducted among South African school adolescents found that the practice of packing a lunch box was as low as 8.6% to 17.4% (Feeley, Musenge, Pettifor et al. 2012). Other studies found that the proportion of children who took packed lunch food from home to school ranged from 41% to 55% (Temple, Steyn, Myburgh et al. 2006) and as high as 69% among children from disadvantaged communities. Most of these studies identified the benefits of taking a lunch box to school to include a low BMI (Abrahams, de Villiers, Steyn et al. 2011). The mean amount of money taken to school among South African children 10–14 years of age was high in urban formal settings, in affluent provinces and among whites and Indians. The analysis showed that the majority of children took no money or a small amount of money (R0–R5) to school and these children were more likely to be from informal urban settings, in all provinces except Gauteng, and mainly black African and coloured children. In the categories that took larger amounts of pocket money to school, a high prevalence was recorded among children in urban formal settings such as the Gauteng and Western Cape. Raychaudhuri & Sanya (2012) link obesity among children from high socio-economic status background in India with 'generous pocket money' provided which is mostly spent on energy dense foods. Grammatikopoulou, Galli–Tsinopoulou, Daskalou et al. (2008) concluded that children spent their pocket money on high energy, fatty and sugary food and that small amounts of pocket money were associated with healthier body weight.

In the context of the reported increase in the prevalence of childhood obesity globally, and the availability of cheap and high energy foods, pocket money can potentially contribute to children's unhealthy diet, unless appropriate interventions at home, schools and the community help equip children with appropriate nutrition knowledge, which can shape dietary behaviour and practices early in life.

3.8.6 Body image and weight management

Body image has been defined as the perception of overall physical appearance. It is considered as a major component of global self-esteem (Pokrajac-Bulian & Zivcic-Becirevic 2005). From a health perspective, health practitioners may prescribe weight management

Table 3.8.6.1: Prevalence of happiness with current weight among children aged 10–14 years by locality, province and race, South Africa 2012

Background characteristics	Males								
	Happy		Somewhat happy		Unhappy		Other		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Locality									
Urban formal	82.4	[76.8–86.8]	6.8	[4.2–10.9]	8.7	[6.1–12.2]	2.1	[0.6–6.7]	498
Urban informal	81.9	[74.4–87.6]	12.3	[7.2–20.1]	5.1	[2.6–9.8]	0.7	[0.1–4.7]	151
Rural formal	76.5	[66.8–84.1]	16.1	[9.2–26.6]	7.4	[4.2–12.9]	0.0		153
Rural informal	83.2	[78.8–86.9]	5.0	[3.1–7.7]	10.2	[7.3–14.2]	1.6	[0.6–4.2]	328
Total	82.2	[79.1–84.9]	7.4	[5.6–9.6]	8.8	[7.1–11.0]	1.6	[0.7–3.5]	1 130
Province									
Western Cape	79.1	[67.6–87.3]	10.6	[5.2–20.4]	9.7	[4.4–20.2]	0.5	[0.1–3.8]	153
Eastern Cape	82.3	[74.3–88.2]	5.2	[2.5–10.4]	10.8	[6.3–17.9]	1.7	[0.3–8.9]	153
Northern Cape	*	*	*	*	*	*	*	*	*
Free State	*	*	*	*	*	*	*	*	*
KwaZulu-Natal	81.2	[74.6–86.4]	6.7	[3.3–12.9]	10.9	[7.5–15.5]	1.2	[0.3–4.7]	198
North West	79.8	[70.0–86.9]	10.2	[5.9–17.2]	8.3	[4.0–16.3]	1.8	[0.4–6.8]	137
Gauteng	87.3	[78.5–92.9]	6.4	[3.1–12.9]	3.0	[1.2–7.4]	3.2	[0.8–12.7]	151
Mpumalanga	77.1	[66.8–85.0]	7.9	[3.1–18.7]	14.9	[9.6–22.4]	0.0		91
Limpopo	81.8	[71.9–88.8]	7.3	[3.5–14.5]	9.6	[4.5–19.6]	1.2	[0.2–8.4]	101
Total	82.2	[79.1–84.9]	7.4	[5.6–9.6]	8.8	[7.1–11.0]	1.6	[0.7–3.5]	1 130
Race									
African	83.3	[80.3–86.0]	6.4	[4.7–8.6]	9.0	[7.1–11.4]	1.3	[0.6–2.7]	836
White	*	*	*	*	*	*	*	*	*
Coloured	78.5	[68.7–86.0]	9.3	[4.9–16.6]	11.6	[6.0–21.3]	0.6	[0.1–4.2]	219
Asian/Indian	*	*	*	*	*	*	*	*	*
Total	82.2	[79.1–84.9]	7.4	[5.6–9.6]	8.8	[7.1–11.0]	1.6	[0.7–3.5]	1 125

95% CI: 95% confidence interval

** Too few observations to record reliably*

interventions for overweight and obese children. This is usually done to reduce the risk of health problems such as diabetes, high blood pressure and high blood cholesterol during childhood and later in adulthood. Moreover, modern Western cultural influences and globalisation have normalised thin body size, leading to weight concerns among children whose bodies do not conform to the ideal body image, particularly among girls. On the other hand, boys prefer muscular bodies that complement their growing self-confidence. Perceptions of boys and girls about their body appearance may affect their emotional wellbeing differently. Furthermore, the concern with obesity and related health problems and body image leads children to initiate, on their own, weight management regimens because they have low self-esteem due to their perceived physical appearance and peer pressure. Healthy weight management (initiated with the advice and guidance of a health professional) and self-directed weight management interventions may include dieting to control energy intake and body fat, behavioural change and physical exercise. While in many instances weight management is aimed at losing weight, it may also be aimed at gaining weight, especially among males. As such, children who participated in the survey were assessed with regard to their satisfaction with their current body weight and weight (loss or gain) management practices.

Females								
Happy		Somewhat happy		Unhappy		Other (specify)		Total
%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
76.6	[70.6–81.7]	7.3	[5.2–10.3]	15.9	[11.5–21.7]	0.1	[0.0–0.4]	534
77.2	[66.3–85.4]	7.2	[4.0–12.6]	14.0	[7.8–24.0]	1.6	[0.5–5.0]	157
81.6	[73.6–87.6]	11.6	[7.4–17.9]	3.9	[1.7–8.6]	2.8	[0.9–8.5]	165
80.0	[74.9–84.2]	5.7	[3.7–8.6]	13.3	[9.7–18.0]	1.0	[0.3–4.1]	340
78.3	[74.9–81.4]	7.0	[5.6–8.8]	13.8	[11.2–17.0]	0.8	[0.4–1.8]	1 196
73.5	[62.0–82.5]	14.9	[9.1–23.5]	11.1	[6.2–19.0]	0.6	[0.1–4.0]	138
78.6	[69.6–85.5]	8.8	[5.0–15.0]	12.2	[7.2–19.9]	0.4	[0.0–2.7]	153
*	*	*	*	*	*	*	*	84
*	*	*	*	*	*	*	*	90
74.6	[65.1–82.2]	3.5	[1.8–6.9]	21.8	[14.7–31.0]	0.1	[0.0–0.7]	209
79.9	[68.9–87.7]	10.9	[6.7–17.4]	6.3	[2.6–14.5]	2.9	[0.7–10.6]	127
84.0	[75.6–90.0]	7.4	[4.3–12.5]	7.7	[3.6–15.6]	0.9	[0.2–3.7]	179
83.0	[71.9–90.3]	4.6	[2.0–10.5]	12.3	[5.9–24.0]	0.0		107
74.8	[65.9–82.0]	4.6	[2.1–9.8]	18.7	[11.8–28.4]	1.9	[0.3–12.1]	109
78.3	[74.9–81.4]	7.0	[5.6–8.8]	13.8	[11.2–17.0]	0.8	[0.4–1.8]	1 196
78.7	[74.9–82.0]	6.0	[4.5–7.9]	14.4	[11.5–18.0]	0.9	[0.4–2.1]	856
*	*	*	*	*	*	*	*	34
72.2	[64.2–79.0]	16.1	[10.9–23.2]	10.8	[6.5–17.6]	0.9	[0.2–3.3]	236
*	*	*	*	*	*	*	*	66
78.3	[74.9–81.4]	7.0	[5.6–8.8]	13.8	[11.2–17.0]	0.8	[0.4–1.8]	1 192

Percentage of happiness with current weight

To assess satisfaction with current body weight, children 10–14 years of age were asked to indicate whether they were happy, somewhat happy or unhappy with their current weight. Overall, the majority of South African children (males: 82.2%; females: 78.3%) indicated that they were happy with their current weight (Table 3.8.6.1). Significantly more females (13.8%) than males (8.8%) were unhappy with their current weight. There were no significant differences by locality for males in all three groups. Rural formal females had a significantly lower percentage for being unhappy (3.9%) when compared with respondents in the rural informal (13.3%), urban informal (14%) and urban formal (15.9%) areas. Similarly, by province, the only significant difference found was in the group of males in Gauteng who were unhappy with their current weight and had a significantly lower rate (3%) when compared with males in KwaZulu-Natal (10.9%) and Mpumalanga (14.9%). In the case of females, while there was no significant difference among the group that was happy with their weight, there was a significant difference between Western Cape (14.9%) and KwaZulu-Natal (3.5%) participants in the group that was somewhat happy, and between KwaZulu-Natal (21.8%) and North West (6.3%) participants in the group that was unhappy with their weight. There were no meaningful statistical differences by race.

Attempted to lose or gain weight in the last 12 months

Overall, 14.9% and 13.5% of all children (males and females) attempted to gain or lose weight, respectively (Table 3.8.6.2). No significant sex differences were observed between those children who attempted to gain weight. However, a significantly higher percentage of female participants (16.7%) attempted to lose weight when compared with males (10.3%). No significant differences by locality were observed between those children who attempted to gain weight. However, a significantly higher percentage of children in the urban formal settings (16.6%) attempted to lose weight compared with children in the rural formal settings (7.4%). Provincially, a significantly higher percentage of children in the Western Cape (29.1%) who attempted to gain weight was observed compared with children in KwaZulu-Natal(12.8%), North West (6.9%), Gauteng (9.8%) and Mpumalanga (11.2%). By contrast, a significantly lower percentage of children attempting to lose weight was seen among children in the Northern Cape (5.3%) when compared with children in the Western Cape (17.7%), KwaZulu-Natal (17.1%) and the Free State (22.0%). The only significant difference by race was observed among children who attempted to gain weight, the percentage being higher among coloured children (24.2%) when compared with black African children (14.2%).

Ideal body image of children aged 10–14 years

More than three quarters (76.5%) of all children aged 10–14 years, had a ‘fat‘ body image ideal, while only 21.9% had a normal body image ideal, and 1.6% had a very thin body image ideal (Table 3.8.6.3). There were no significant differences by sex between the three groups. In the group that perceived they had a very thin body image ideal, urban informal had a significantly higher (4.5%) percentage than urban formal setting (1%). In the urban formal setting, a significantly higher percentage (27.4%) of participants chose a normal body image ideal than those in the rural informal setting (15.5%). Conversely, in the group that perceived they had a fat body image ideal, in the rural informal setting a significantly higher percentage (82.9%) of participants chose a fat body image ideal than in the urban formal settings (71.6%). Provincially, the percentage of participants that chose a very thin body image ideal was significantly higher in Northern Cape (6.9%) than in Western Cape (0.3%), Eastern Cape (1.0%), Gauteng (0.2%) and Limpopo (0.1%). The percentage of participants that chose a normal body image ideal was significantly lower in the Eastern

Table 3.8.6.2: Percentage of all participants aged 10–14 years who attempted to lose or gain weight in the last 12 months by sex, locality, province and race, South Africa 2012

Background characteristics	Attempted to gain weight					Attempted to lose weight				
	Yes		No		Sample	Yes		No		Sample
	%	95% CI	%	95% CI	n	%	95% CI	%	95% CI	n
Sex										
Male	15.9	[13.1–19.2]	84.1	[80.8–86.9]	1 131	10.3	[8.2–12.9]	89.7	[87.1–91.8]	1 127
Female	14.0	[11.3–17.3]	86.0	[82.7–88.7]	1 202	16.7	[13.7–20.1]	83.3	[79.9–86.3]	1 200
Locality										
Urban formal	17.3	[13.5–22.0]	82.7	[78.0–86.5]	1 070	16.6	[13.2–20.7]	83.4	[79.3–86.8]	1 070
Urban informal	10.4	[6.0–17.5]	89.6	[82.5–94.0]	320	11.8	[6.7–19.9]	88.2	[80.1–93.3]	319
Rural formal	14.3	[10.1–20.0]	85.7	[80.0–89.9]	324	7.4	[4.3–12.5]	92.6	[87.5–95.7]	323
Rural informal	13.5	[10.3–17.5]	86.5	[82.5–89.7]	695	11.6	[8.8–15.2]	88.4	[84.8–91.2]	691
Province										
Western Cape	29.1	[21.7–37.9]	70.9	[62.1–78.3]	294	17.7	[12.0–25.4]	82.3	[74.6–88.0]	293
Eastern Cape	18.5	[13.4–24.9]	81.5	[75.1–86.6]	320	11.9	[8.4–16.6]	88.1	[83.4–91.6]	320
Northern Cape	17.3	[8.6–31.8]	82.7	[68.2–91.4]	153	5.3	[2.3–11.6]	94.7	[88.4–97.7]	153
Free State	25.4	[17.9–34.7]	74.6	[65.3–82.1]	178	22.0	[13.4–33.9]	78.0	[66.1–86.6]	178
KwaZulu-Natal	12.8	[8.4–18.9]	87.2	[81.1–91.6]	416	17.1	[12.2–23.4]	82.9	[76.6–87.8]	415
North West	6.9	[3.6–12.6]	93.1	[87.4–96.4]	278	5.7	[3.4–9.7]	94.3	[90.3–96.6]	278
Gauteng	9.8	[5.7–16.1]	90.2	[83.9–94.3]	353	10.8	[7.0–16.2]	89.2	[83.8–93.0]	353
Mpumalanga	11.2	[6.1–19.7]	88.8	[80.3–93.9]	203	5.4	[2.8–10.1]	94.6	[89.9–97.2]	200
Limpopo	16.2	[9.6–26.0]	83.8	[74.0–90.4]	214	18.0	[11.1–27.8]	82.0	[72.2–88.9]	213
Race										
African	14.2	[11.7–17.0]	85.8	[83.0–88.3]	1 703	12.8	[10.6–15.4]	87.2	[84.6–89.4]	1 699
White	*	*	*	*	55	*	*	*	*	55
Coloured	24.2	[19.3–29.8]	75.8	[70.2–80.7]	458	17.7	[13.4–23.2]	82.3	[76.8–86.6]	457
Asian/Indian	26.6	[7.2–62.8]	73.4	[37.2–92.8]	111	25.6	[13.6–43.1]	74.4	[56.9–86.4]	111
Total	14.9	[12.7–17.5]	85.1	[82.5–87.3]	2 409	13.5	[11.5–15.9]	86.5	[84.1–88.5]	2 403

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.8.6.3: Ideal body image of children aged 10–14 years by sex, locality, province and race, South Africa 2012

Background characteristics	Very thin		Normal weight		Fat image		Total
	%	95% CI	%	95% CI	%	95% CI	n
Sex							
Male	1.4	[0.8–2.5]	23.5	[20.2–27.1]	75.1	[71.4–78.5]	1 125
Female	1.8	[1.1–3.0]	20.4	[17.1–24.1]	77.8	[74.0–81.2]	1 194
Total	1.6	[1.1–2.4]	21.9	[19.4–24.6]	76.5	[73.8–79.0]	2 319
Locality							
Urban formal	1.0	[0.5–1.9]	27.4	[22.9–32.5]	71.6	[66.5–76.3]	1 066
Urban informal	4.5	[2.2–9.1]	20.5	[15.3–26.8]	75.1	[67.8–81.1]	320
Rural formal	1.7	[0.7–4.1]	23.5	[17.5–30.7]	74.8	[67.2–81.1]	318
Rural informal	1.6	[0.8–3.0]	15.5	[12.6–18.9]	82.9	[79.4–85.9]	690
Total	1.6	[1.1–2.4]	21.9	[19.4–24.6]	76.5	[73.8–79.0]	2 394
Province							
Western Cape	0.3	[0.0–2.0]	32.6	[23.4–43.4]	67.1	[56.3–76.3]	292
Eastern Cape	1.0	[0.3–3.4]	16.4	[12.2–21.8]	82.6	[76.9–87.1]	320
Northern Cape	4.2	[0.8–19.4]	30.1	[21.0–41.3]	65.6	[53.7–75.8]	157
Free State	2.0	[0.5–7.6]	19.9	[12.8–29.6]	78.0	[68.9–85.1]	177
KwaZulu-Natal	2.8	[1.5–5.0]	18.2	[13.7–23.9]	79.0	[73.7–83.5]	414
North West	6.9	[3.7–12.8]	25.5	[20.0–31.8]	67.6	[59.1–75.1]	270
Gauteng	0.2	[0.0–0.9]	24.7	[18.4–32.2]	75.1	[67.6–81.4]	350
Mpumalanga	1.2	[0.2–7.1]	24.0	[17.7–31.8]	74.7	[66.5–81.5]	202
Limpopo	0.1	[0.0–0.7]	17.1	[11.5–24.7]	82.8	[75.2–88.4]	212
Total	1.6	[1.1–2.4]	21.9	[19.4–24.6]	76.5	[73.8–79.0]	2 394
Race							
African	1.8	[1.2–2.7]	20.0	[17.6–22.6]	78.2	[75.5–80.7]	1 691
Coloured	0.3	[0.1–1.9]	29.8	[24.0–36.3]	69.8	[63.3–75.6]	459
Asian/Indian	0.6	[0.1–4.5]	23.9	[13.2–39.3]	75.5	[59.7–86.5]	109
Total	1.6	[1.1–2.4]	21.9	[19.4–24.6]	76.5	[73.8–79.0]	2 317

95% CI: 95% confidence interval

** Too few observations to record reliably*

Cape (16.4%). Conversely, a higher percentage of participants that chose a fat body image ideal was observed in the Eastern Cape (82.6%) than Western Cape (67.1%). Limpopo on the other hand, had a significantly higher percentage of participants (82.8%) that chose a fat body image ideal than North West (67.6%). Significantly more Coloured children (29.8%) preferred a normal body image ideal than black African children (20,0%).

Correct identification of body image from body image silhouettes

Overall, 98.1% and 99.6% of children aged 10–14 years were able to correctly identify a 'very thin' and a 'fat' body image, respectively, from body image colour photo silhouettes shown to them (Table 3.8.6.4). There were no significant differences by sex, locality, province and race for children in these groups. However, only 18.2% of children were able to correctly identify a 'normal' body image and there was no significant difference by sex for this group. Children in an urban formal setting had a significantly higher percentage (23%) of correctly identifying a normal body image when compared with children in a rural informal setting (13.2%), a setting with the lowest recorded percentage. Provincially, children in Limpopo had a significantly lower percentage (7.8%) of correctly identifying a normal body image compared with children in the other eight provinces, where the percentage of correct identification of normal weight ranged from 15.6% (Eastern Cape) to 30% in the Northern Cape. Black African children had a significantly lower percentage (15.9%) of correctly identifying a normal body image silhouette compared with coloured children (24.7%).

Table 3.8.6.4: Correct identification of body image from body image silhouettes among children aged 10–14 years by sex. locality. province and race. South Africa 2012

Background characteristics	Correctly identified 'very thin' body image		Correctly identified 'normal weight' body image		Correctly identified 'fat' body image		Total
	%	95% CI	%	95% CI	%	95% CI	n
Sex							
Male	98.3	[97.0–99.0]	21.2	[17.8–25.2]	99.5	[98.8–99.8]	1 124
Female	98.0	[96.6–98.8]	15.2	[12.6–18.3]	99.7	[99.3–99.9]	1 191
Locality							
Urban formal	98.5	[97.1–99.3]	23.0	[18.8–27.8]	99.8	[99.2–99.9]	1 061
Urban informal	97.0	[92.5–98.8]	16.2	[11.0–23.3]	98.7	[94.5–99.7]	318
Rural informal	98.1	[96.3–99.0]	13.2	[10.6–16.2]	99.9	[99.2–100.0]	691
Rural formal	97.3	[94.1–98.8]	18.3	[12.9–25.3]	99.0	[95.6–99.8]	320
Province							
Western Cape	98.9	[97.2–99.5]	24.7	[16.9–34.6]	99.7	[98.1–100.0]	291
Eastern Cape	98.6	[95.0–99.6]	15.6	[10.9–21.9]	100.0		321
Northern Cape	100.0		30.0	[20.4–41.8]	100.0		158
Free State	94.8	[88.3–97.8]	15.9	[8.4–28.2]	100.0		176
KwaZulu-Natal	97.2	[94.8–98.6]	18.0	[14.4–22.3]	99.5	[98.1–99.9]	413
North West	95.9	[88.8–98.5]	26.7	[19.9–34.9]	98.7	[96.1–99.6]	273
Gauteng	98.9	[96.3–99.7]	19.5	[13.6–27.1]	100.0		347
Mpumalanga	98.2	[94.5–99.4]	16.6	[10.6–25.1]	98.4	[88.7–99.8]	200
Limpopo	99.8	[98.3–100.0]	7.8	[4.5–13.2]	99.8	[98.3–100.0]	211
Race							
African	98.0	[97.0–98.7]	15.9	[13.8–18.4]	99.6	[99.1–99.8]	1 691
White	*	*	*	*	*	*	52
Coloured	97.6	[95.2–98.8]	24.7	[18.5–32.2]	99.7	[98.0–100.0]	457
Asian/Indian	99.2	[96.5–99.8]	26.0	[14.1–43.0]	100.0		109
Total	98.1	[97.2–98.7]	18.2	[15.9–20.7]	99.6	[99.3–99.8]	2 313

95% CI: 95% confidence interval

** Too few observations to record reliably*

Perceived compared to ideal BMI of children aged 10–14 years

Overall, less than half (46.3%) of children's perceived BMI equalled their ideal BMI, 36.6% of children's perceived BMI was lower than their ideal BMI, while 17.1% of children had a perceived BMI higher than their ideal BMI (Table 3.8.6.5). There were no significant sex differences in any of the three groups. In the group whose perceived BMI equalled their ideal BMI, rural formal residents (55.9%) had a significantly higher percentage than both urban informal (40.4%) and rural informal (43.3%). In the group whose perceived BMI was higher than their ideal BMI, urban formal residents had a significantly higher percentage (20.6%) than rural informal (12.9%). In the group whose perceived BMI was lower than their ideal BMI, rural informal residents had a significantly higher percentage (43.8%) than urban formal (30.9%) and rural formal (31.6%). Provincially, in the group whose perceived BMI equalled their ideal BMI, there were no significant differences between provinces. In the group whose perceived BMI was higher than their ideal BMI, residents in Eastern Cape had a significantly lower percentage (11.7%) of their perception of having a higher than ideal BMI when compared with the children in KwaZulu-Natal (24.1%) and Northern Cape (24.4%). In the group whose perceived BMI was lower than their ideal BMI, Eastern Cape had a significantly higher percentage (54.3%) compared with the percentage in the Northern Cape, KwaZulu-Natal, North West and Gauteng, which ranged from 30.6% to 34.4%. There were no significant differences by sex in any of the three groups in any of the BMI categories of comparison.

Perceived BMI compared to actual BMI

When comparing perceived BMI with actual BMI of children 10–14 years, there were no sex differences (data not shown). However, more children perceived their BMI to be higher than their actual BMI (males 12.7% and females 16.2%) compared to 3.9% of males and 5.1% of females whose perceived BMI equalled the actual BMI, and 0.2% of males and 0.6% of females whose perceived BMI was lower than their actual BMI. Furthermore, more children (49.3%) in the Western Cape perceived their BMI to be higher than their actual BMI compared to children in KwaZulu-Natal (25.8%). Finally, more coloured children (4.4%) perceived their BMI to be lower than their actual BMI compared to black African children (0.1%).

Perception of own body image of children aged 10–14 years

Overall, while only one out of 3 children (36.4%) perceived they had a normal body image, nearly two thirds (61.6%) perceived themselves to have a 'fat' body image, and only 2% perceived themselves to have a 'very thin' body image (Table 3.8.6.6). There were significant differences by sex in the group who perceived they had a normal body image (42.4% males vs 30.5% females), as well as those who perceived they had a fat body image (55.3% males vs 67.7% females). Although there were no significant differences by locality in any of the three groups, provincially in the group that perceived they had a very thin body image, North West had a significantly higher percentage (7%) compared with the Western Cape (0.5%), Northern Cape (1.1%), Free State (1.3%) and KwaZulu-Natal (0.9%). In the group that perceived they had a normal body image, KwaZulu-Natal had a significantly lower percentage of participants who perceived a normal body image (26.7%) compared with Western Cape (42.5%), Eastern Cape (42%), Free State (39.7%) and North West (45.0%). Conversely, in the group that perceived they had a fat body image, KwaZulu-Natal had a significantly higher percentage (72.5%) compared with Western Cape (57,0%), Eastern Cape (54.7%), Free State (59.0%), North West (48.0%) and Mpumalanga (56.3%). A significantly lower percentage of black African children (35.0%) perceived they had a normal body image compared with coloured children (44.5%).

Table 3.8.6.5: Perceived compared to ideal BMI among children aged 10–14 years by sex, locality, province and race, South Africa 2012

Background characteristics	Perceived BMI equals Ideal BMI		Perceived BMI higher than Ideal BMI		Perceived BMI lower than Ideal BMI		Total
	%	95% CI	%	95% CI	%	95% CI	n
Sex							
Male	46.4	[41.6–51.2]	12.6	[10.0–15.7]	41.1	[36.6–45.7]	1 104
Female	46.2	[42.0–50.4]	21.5	[18.3–25.1]	32.3	[28.7–36.1]	1 183
Total	46.3	[42.9–49.7]	17.1	[14.9–19.5]	36.6	[33.4–40.0]	2 287
Locality							
Urban formal	48.5	[42.7–54.3]	20.6	[16.8–24.9]	30.9	[26.2–36.2]	1 047
Urban informal	40.4	[33.3–48.0]	21.2	[15.2–28.7]	38.4	[30.7–46.8]	317
Rural formal	55.9	[48.7–62.8]	12.5	[8.4–18.1]	31.6	[26.7–37.0]	315
Rural informal	43.3	[38.2–48.6]	12.9	[10.2–16.2]	43.8	[38.5–49.2]	683
Total	46.3	[42.9–49.7]	17.1	[14.9–19.5]	36.6	[33.4–40.0]	2 362
Province							
Western Cape	46.7	[37.0–56.6]	18.3	[12.0–27.0]	35.0	[25.8–45.3]	288
Eastern Cape	34.0	[25.2–44.1]	11.7	[8.4–16.1]	54.3	[44.0–64.2]	315
Northern Cape	43.9	[32.4–56.2]	24.4	[15.2–36.9]	31.7	[25.2–39.0]	158
Free State	46.2	[38.2–54.4]	16.3	[10.2–24.9]	37.5	[28.9–47.0]	175
KwaZulu-Natal	45.3	[39.0–51.8]	24.1	[18.8–30.2]	30.6	[26.2–35.5]	409
North West	52.2	[42.8–61.4]	13.5	[8.5–20.8]	34.4	[26.2–43.5]	263
Gauteng	51.8	[43.0–60.5]	17.0	[11.9–23.7]	31.2	[24.0–39.5]	344
Mpumalanga	56.5	[42.8–69.3]	13.3	[7.9–21.4]	30.2	[18.4–45.4]	198
Limpopo	42.9	[35.2–51.0]	13.9	[9.0–20.7]	43.2	[34.5–52.4]	212
Total	46.3	[42.9–49.7]	17.1	[14.9–19.5]	36.6	[33.4–40.0]	2 362
Race							
African	45.8	[42.1–49.7]	17.1	[14.7–19.7]	37.1	[33.6–40.7]	1 668
White	*	*	*	*	*	*	53
Coloured	45.4	[39.4–51.6]	18.9	[14.0–25.0]	35.7	[29.6–42.3]	452
Asian/Indian	38.4	[22.5–57.4]	15.5	[8.1–27.6]	46.0	[24.1–69.7]	108
Total	46.3	[42.9–49.7]	17.1	[14.9–19.5]	36.6	[33.4–40.0]	2 285

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.8.6.6: Perception of own body image among children aged 10–14 years by sex, locality, province and race, South Africa 2012

	Very thin		Normal weight		Fat body image		Total
	%	95% CI	%	95% CI	%	95% CI	n
Sex							
Male	2.2	[1.4–3.7]	42.4	[38.4–46.6]	55.3	[51.0–59.6]	1 106
Female	1.8	[1.1–3.0]	30.5	[26.6–34.6]	67.7	[63.5–71.7]	1 184
Total	2.0	[1.4–2.9]	36.4	[33.5–39.3]	61.6	[58.5–64.6]	2 290
Locality							
Urban formal	1.7	[0.9–3.2]	37.5	[32.3–42.9]	60.9	[55.2–66.2]	1.05
Urban informal	3.7	[1.5–8.6]	32.5	[26.6–38.9]	63.8	[55.6–71.3]	317
Rural formal	2.9	[1.5–5.6]	38.6	[32.4–45.2]	58.4	[51.8–64.7]	315
Rural informal	1.8	[1.0–3.2]	35.6	[31.6–39.9]	62.6	[58.1–66.9]	683
Total	2.0	[1.4–2.9]	36.4	[33.5–39.3]	61.6	[58.5–64.6]	2 365
Province							
Western Cape	0.5	[0.1–2.0]	42.5	[33.5–52.1]	57.0	[47.5–65.9]	289
Eastern Cape	3.3	[1.6–6.6]	42.0	[36.1–48.1]	54.7	[47.8–61.5]	315
Northern Cape	1.1	[0.3–4.0]	37.1	[27.8–47.6]	61.8	[51.1–71.5]	158
Free State	1.3	[0.4–3.7]	39.7	[31.9–48.1]	59.0	[50.6–66.9]	176
KwaZulu-Natal	0.9	[0.3–2.4]	26.7	[22.5–31.3]	72.5	[67.8–76.7]	410
North West	7.0	[4.1–12.0]	45.0	[35.5–54.8]	48.0	[37.2–59.0]	263
Gauteng	1.7	[0.6–4.8]	36.9	[29.3–45.1]	61.4	[52.8–69.4]	344
Mpumalanga	2.6	[0.9–7.6]	41.1	[30.8–52.2]	56.3	[45.4–66.6]	198
Limpopo	1.1	[0.3–4.1]	31.2	[24.4–38.8]	67.7	[60.1–74.5]	212
Total	2.0	[1.4–2.9]	36.4	[33.5–39.3]	61.6	[58.5–64.6]	2 365
Race							
African	2.1	[1.5–3.1]	35.0	[32.0–38.2]	62.8	[59.4–66.1]	1 669
White	*	*	*	*	*	*	54
Coloured	2.1	[0.8–5.2]	44.5	[38.8–50.5]	53.3	[47.2–59.3]	453
Asian/Indian	0.4	[0.1–3.2]	58.4	[36.6–77.4]	41.2	[22.4–62.9]	108
Total	2.0	[1.4–2.9]	36.4	[33.5–39.3]	61.6	[58.5–64.6]	2 288

95% CI: 95% confidence interval

** Too few observations to record reliably*

Discussion

With regard to body weight, the results of this survey indicate that more than three quarters of South African children claimed to be happy about their body weight status with a significant minority of children who attempted to gain or lose weight. Sex and locality seem to differentiate body image happiness in that more males were happy with their weight than females. On average, more children living in the urban areas were happy with their current weight than children living in the rural informal areas. Although the majority of South African children claimed to be happy about their body size, only 46% of them correctly selected desired (ideal) silhouettes that were equal to their perceived silhouettes. Similar results have been observed in South African adults. On this basis, one could argue that less than half of South African children were satisfied with their body weight status.

With regard to weight, it is notable that South African children may not understand the term 'normal weight', since only a handful of them could identify the 'normal weight' silhouette from those shown to them. In this respect, there were no statistical differences by sex. However, children in the urban formal settings were better at identifying a 'normal weight' than children in other locality settings. This is a cause for concern since understanding of 'normal weight' is the key to adopting a healthier weight (Silva, Markland, Minderico et al. 2008). What is of greater concern is that the children in this survey seemed to have a distorted body image, such that few could correctly identify their own body weight status. Indeed, three-quarters of children thought they were fat.

Although the findings of this survey indicate that the percentage of body dissatisfaction and attendant attempts to use weight reduction methods among South African children were not high, one should be cognisant of the evidence which suggests that societal trends may be forcing women to view themselves as objects, based on their appearance (Morry & Staska 2001). For instance, society at large publicises a thin body as the ideal for women, thus objectifying their bodies and causing an increase in body dissatisfaction and eating disturbances, which are on the increase (Morry & Staska 2001). In this regard, a study by Murnen, Smolak, Mills et al. (2003) has shown that advertisements promoting specific body parts pressurise women to view themselves and be viewed by others as objects (Murnen, Smolak, Mills et al. 2003). In the same study, the authors suggested that, while girls view their bodies as objects and need to change in order to be more attractive, boys consider their bodies as a tool to control others (Murnen, Smolak, Mills et al. 2003). These influences, among others, increase the risk of females for developing eating disorders. Evidence for men is not as clear as in women in this regard. However, more recently, emphasis upon an idealized male body has made objectification a problem among men as well, leading to an increase in body dissatisfaction, body dysmorphic disorders, and unhealthy weight gain behaviours (Murnen, Smolak, Mills et al. 2003). Media promotion of the ideal body as slimness for women and muscularity for men exacerbates the situation in that increasing numbers of children of both sexes report dissatisfaction with their bodies and trying to change their weight by using weight control products (Luevorasirikul 2007). Health education in schools and the media should therefore strive to impart a more objective approach to body image in order to combat eating disorders and improve self-esteem and physical health of young South Africans.

3.9 Perceptions of general health

Health status is an individual's relative level of wellness and ill health, taking into account the presence of biological or physiological dysfunction, symptoms and functional impairment (Mattera, De Leon, Wackers et al. 2000; www.rice.edu; www.mrc.ac.za). Health perceptions (or perceived health status) are the subjective ratings by an individual of his or her health status (Baert & Norre 2009). An individual's perception of their general health status is a good predictor of overall health outcomes given the fact that some individuals with existing disease conditions perceive themselves to be 'healthy' and others without confirmed diagnosis of disease perceive themselves to be 'ill' or 'unhealthy (Baert & Norre 2009). Clinicians also use perceived health status as an outcome measure of treatment success (Mattera, De Leon, Wackers et al. 2000).

In the SANHANES-1 adult questionnaire, the module 'Perceptions of general health' comprised of various measures of self-reported physical and mental health status. In the SANHANES 1 population, health status was ascertained by aggregating scores collected at an individual level. The results of these self-reported assessments provide an estimation of the overall health status, daily functioning, exposure to traumatic events and levels of psychological distress of the South African population. In addition, the Perceptions of general health module also provides an estimation of the prevalence of post-traumatic-stress disorder (PTSD) among adults, 15 years and older, in South Africa. The mental health status measures in SANHANES-1 addresses a gap in social epidemiological surveillance in South Africa. Knowing the true estimate of the prevalence of mental disorders is very important given the fact that common mental disorders (CMDs), which include depression, anxiety and somatoform disorders, make a significant contribution to the burden of disease and disability in low- and middle-income countries (LMICs) (WHO 2001, Lopez et al. 2006). In South Africa, the Stress and Health Study (SASH) was the first population-based study of mental disorders (Herman et al. 2009). SANHANES-1, however, conducts a more comprehensive examination of mental and physical health status components.

3.9.1 Health status and difficulties with work or household activities

In this section, some aspects of reported health status are presented.

3.9.1.1 Health status

Participants rated their overall general health in various categories that ranged from very good/good to bad/very bad. This self-rating was an indication of the individual's perception level of overall functioning with respect to their physical and mental health. The percentage of participants that rated themselves in each category were: 37.1% as very good, 41.5% as good, 16.2% as moderate and 5.1% as bad to very bad. The majority of participants (78.6%) reported having very good to good health (Table 3.9.1.1).

The following differences were found for very good health status at a 5%-level of significance: participants aged 15–24 (45.1%), 25–34 (36.9%) and 35–44 (37.5%) had significantly higher very good health status as compared to participants aged 45–54 (31.3%), 55–64 (27%) and 65 years and over (20.8%); participants aged 15–24 years had better health status than all other age categories; each age category had better health status than the next implying that the older participants' ranked lower than the younger participants with respect to very good health status; respondents from the urban formal areas (39.5%) reported higher levels of very good health compared to those from rural informal areas (29.7%); respondents from urban informal areas (33.7%) reported lower

Table 3.9.1.1: Reported overall self-rated health status on the day of the interview among participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	Self-rated overall general health								Total
	Very good		Good		Moderate		Bad and very bad		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex									
Male	40.4	[36.8–44.1]	40.1	[37.5–42.9]	14.9	[13.1–16.8]	4.6	[3.8–5.6]	6 287
Female	34.2	[31.1–37.4]	42.7	[40.4–45.0]	17.5	[16.0–19.1]	5.6	[4.8–6.5]	8 914
Total	37.1	[34.0–40.4]	41.5	[39.2–43.8]	16.2	[14.8–17.8]	5.1	[4.4–5.9]	15 201
Age									
15–24	45.1	[41.0–49.2]	41.5	[38.2–44.8]	10.7	[9.2–12.5]	2.7	[2.1–3.6]	4 296
25–34	39.6	[35.0–44.4]	43.7	[39.6–47.8]	13.3	[11.3–15.6]	3.4	[2.6–4.6]	2 989
35–44	37.5	[33.7–41.4]	40.7	[37.8–43.7]	16.1	[13.9–18.6]	5.7	[4.5–7.2]	2 493
45–54	31.3	[27.0–35.9]	40.4	[36.5–44.5]	21.8	[18.9–25.0]	6.5	[5.2–8.1]	2 276
55–64	27.0	[22.1–32.5]	41.9	[36.6–47.5]	22.7	[19.5–26.2]	8.4	[6.5–10.9]	1 740
65+	20.8	[16.8–25.4]	37.7	[32.9–42.8]	29.5	[25.4–33.9]	11.9	[9.6–14.8]	1 403
Total	37.1	[34.0–40.4]	41.5	[39.2–43.8]	16.2	[14.8–17.8]	5.1	[4.4–5.9]	15 197
Locality									
Urban formal	39.5	[34.6–44.6]	40.6	[37.3–44.1]	15.4	[13.3–17.7]	4.5	[3.5–5.7]	8 236
Urban informal	33.7	[27.1–41.0]	42.0	[36.6–47.6]	17.9	[15.0–21.3]	6.4	[4.6–9.0]	1 884
Rural formal	47.8	[41.6–54.0]	34.6	[30.5–38.8]	14.3	[10.0–20.2]	3.3	[2.0–5.5]	1 854
Rural informal	29.7	[26.2–33.4]	45.4	[42.0–48.9]	18.2	[16.3–20.2]	6.7	[5.6–8.1]	3 233
Total	37.1	[34.0–40.4]	41.5	[39.2–43.8]	16.2	[14.8–17.8]	5.1	[4.4–5.9]	15 207
Province									
Western Cape	28.7	[23.7–34.2]	46.9	[42.8–51.1]	19.6	[16.9–22.6]	4.8	[3.7–6.3]	2 146
Eastern Cape	24.3	[18.5–31.2]	47.0	[42.3–51.8]	20.5	[17.5–23.8]	8.2	[6.4–10.5]	1 623
Northern Cape	35.9	[28.5–44.0]	46.9	[40.3–53.5]	12.0	[8.4–16.9]	5.2	[3.3–8.1]	996
Free State	27.5	[23.3–32.2]	40.4	[35.8–45.2]	21.6	[16.6–27.7]	10.4	[7.1–15.1]	820
KwaZulu-Natal	28.2	[23.4–33.4]	45.4	[40.9–50.0]	17.7	[15.1–20.7]	8.7	[6.3–11.8]	2 520
North West	49.9	[43.7–56.2]	30.5	[26.0–35.3]	16.4	[13.4–20.1]	3.1	[1.9–5.2]	1 928
Gauteng	48.3	[40.9–55.8]	37.6	[32.5–43.1]	11.9	[9.0–15.6]	2.2	[1.4–3.3]	2 602
Mpumalanga	39.1	[29.8–49.1]	35.1	[27.4–43.7]	20.3	[14.6–27.4]	5.6	[4.0–7.7]	1 329
Limpopo	30.4	[25.7–35.6]	49.4	[43.8–55.0]	15.2	[12.3–18.8]	5.0	[3.7–6.7]	1 243
Total	37.1	[34.0–40.4]	41.5	[39.2–43.8]	16.2	[14.8–17.8]	5.1	[4.4–5.9]	15 207
Race									
African	36.6	[32.7–40.7]	41.1	[38.5–43.9]	16.7	[15.0–18.5]	5.6	[4.7–6.6]	10 095
White	46.9	[39.5–54.5]	40.2	[33.2–47.6]	10.5	[7.7–14.0]	2.4	[1.3–4.3]	710
Coloured	32.7	[28.6–37.0]	44.5	[40.6–48.5]	18.9	[16.4–21.6]	3.9	[3.1–4.9]	3 054
Asian/Indian	27.0	[18.1–38.3]	46.9	[41.1–52.8]	18.5	[14.5–23.3]	7.5	[4.0–13.9]	1 295
Total	37.1	[34.0–40.4]	41.5	[39.2–43.8]	16.2	[14.8–17.8]	5.1	[4.4–5.9]	15 199

95% CI: 95% confidence interval

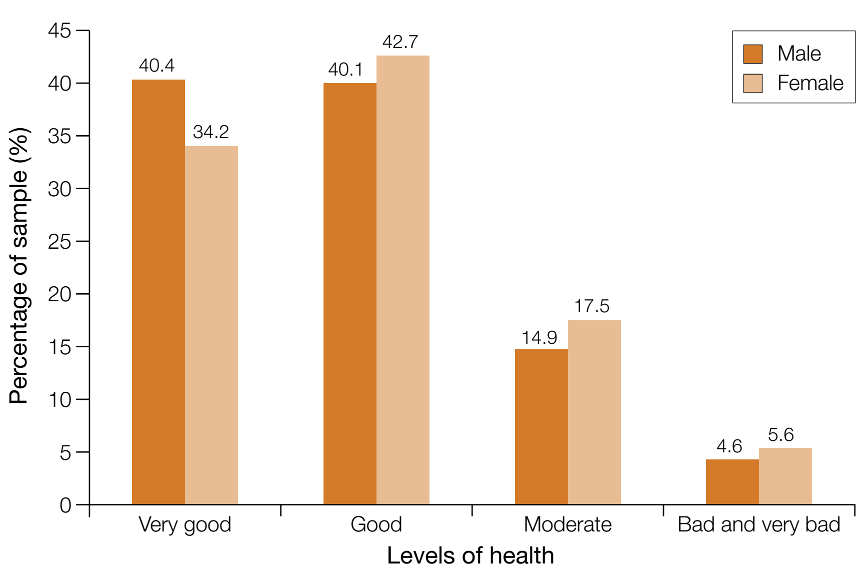
levels than those from rural formal areas (47.8%) and those from rural informal areas reported lower levels of very good health than those in the rural formal areas. North West (49.9%) and Gauteng (48.3%) reported higher levels of very good health compared to the other provinces. This finding is significant when Gauteng is compared to Western Cape (28.7%), Eastern Cape (24.3%), Free State (27.5%), and KwaZulu-Natal (28.2%), as well as when North West is compared to Western Cape, Eastern Cape, Free state, KwaZulu-Natal, Limpopo (30.4%),Gauteng (48.3%) and Mpumalanga (39.1%). Finally, whites (46.9%) had higher levels of very good health status compared to coloureds (32.7%) and Indians (27%).

For moderate levels of general health, respondents aged 15–24 years reported significantly lower levels that older age groups. Clearly, therefore, older participants perceive that they have a worse health status as compared to younger participants. In addition, whites (10.5%) reported significantly lower levels of moderate general health compared to Africans (16.7%), coloureds (18.9%) and Indians (18.5%).

For bad to very bad health status, respondents aged 15–24 years (2.7%) reported significantly lower levels than all the other age groups with 11.9% of respondents aged 65 years and older reporting bad to very bad health. In addition, rural informal areas (6.7%) reported significantly higher bad to very bad health compared to rural formal (3.3%) areas, and Free State (10.4%) was significantly higher when compared to Western Cape, North West, Gauteng and Limpopo. Gauteng (2.2%) reported significantly lower bad to very bad health status (2.2%) when compared to Western Cape, Eastern Cape, KwaZulu-Natal, Mpumalanga and Limpopo. Finally, North West (3.1%) was significantly lower than Eastern Cape and KwaZulu-Natal, and Western Cape was significantly lower than Eastern Cape. Black Africans (5.6%) reported significantly higher levels than whites (2.4%).

When the data was disaggregated by sex, the following was found to be significant for very good health status: For males, younger participants had better health status than older ones; urban formal dwellers (42.6%) report higher levels than rural informal (32.4%), while rural informal is significantly lower than rural formal (50.4%) areas (Table 3.9.1.2).

Figure 3.9.1.1 Overall general health among participants aged 15 years and older, South Africa 2012



Gauteng (51%) and North West (54.2%) reported the highest levels of very good health and this was significant when Gauteng was compared to Western Cape and Eastern Cape, and when North West was compared to Limpopo. Gauteng (2%) reported the lowest levels of bad to very bad health and Free State (11.1%) reported the highest levels of bad to very bad health. For females, younger participants had better health than older ones; rural formal reported significantly higher levels of very good health than rural informal and urban formal; urban formal areas reported higher levels than rural informal (Table 3.9.1.3). Finally, white females reported higher levels of very good health than coloured females.

Table 3.9.1.2: Reported overall self-rated health status on the day of the interview among male participants aged 15 years and older by age, locality, province and race, South Africa 2012

Background characteristics	Very good		Bad and very bad		Total
	%	95% CI	%	95% CI	n
Age					
15–24	47.7	[42.8–52.7]	2.8	[1.9–4.1]	1 976
25–34	44.1	[38.8–49.7]	2.9	[1.8–4.7]	1 253
35–44	42.0	[36.8–47.5]	5.7	[4.0–8.0]	962
45–54	30.7	[25.8–36.0]	5.5	[4.0–7.5]	895
55–64	28.2	[21.6–35.8]	8.5	[5.6–12.7]	719
65+	20.8	[16.1–26.5]	10.0	[6.5–14.9]	477
Total	40.4	[36.8–44.1]	4.6	[3.8–5.6]	6 282
Locality					
Urban formal	42.6	[37.2–48.3]	4.1	[3.0–5.4]	3 453
Urban informal	37.5	[29.6–46.0]	5.8	[3.7–9.2]	739
Rural formal	50.4	[43.8–57.0]	3.2	[1.5–6.8]	846
Rural informal	32.4	[28.3–36.7]	6.0	[4.5–8.0]	1 249
Total	40.4	[36.8–44.1]	4.6	[3.8–5.6]	6 287
Province					
Western Cape	28.7	[23.4–34.6]	4.0	[2.5–6.2]	909
Eastern Cape	27.9	[21.0–36.1]	8.4	[5.9–11.8]	679
Northern Cape	38.6	[30.1–47.9]	4.7	[2.6–8.5]	413
Free State	31.8	[26.3–38.0]	11.1	[6.9–17.4]	342
KwaZulu-Natal	31.8	[26.2–37.9]	7.1	[4.5–11.0]	1 064
North West	54.2	[46.9–61.2]	2.7	[1.2–5.9]	752
Gauteng	51.0	[43.0–59.0]	2.0	[1.2–3.4]	1 108
Mpumalanga	40.5	[30.3–51.7]	5.3	[3.1–8.7]	533
Limpopo	35.8	[29.0–43.2]	4.1	[2.1–7.6]	487
Total	40.4	[36.8–44.1]	4.6	[3.8–5.6]	6 287

95% CI: 95% confidence interval

Table 3.9.1.3: Reported overall self-rated health status on the day of the interview among female participants aged 15 years and older by age, locality and race, South Africa 2012

Background characteristics	Very good		Total
	%	95% CI	n
Age			
15–24	42.4	[38.3–46.6]	2 318
25–34	35.3	[30.4–40.5]	1 736
35–44	33.4	[29.5–37.6]	1 530
45–54	31.8	[26.4–37.7]	1 379
55–64	26.0	[21.3–31.3]	1 020
65+	20.8	[15.9–26.7]	926
Total	34.2	[31.1–37.4]	8 909
Locality			
Urban formal	36.6	[31.8–41.7]	4 781
Urban informal	30.6	[24.4–37.5]	1 144
Rural formal	44.9	[38.1–52.0]	1 008
Rural informal	27.5	[23.9–31.5]	1 981
Total	34.2	[31.1–37.4]	8 914
Race			
African	33.5	[29.8–37.4]	6 006
White	45.4	[36.4–54.8]	385
Coloured	30.1	[26.2–34.4]	1 790
Asian/Indian	23.4	[13.4–37.6]	712
Total	34.2	[31.1–37.4]	8 908

95% CI: 95% confidence interval

3.9.1.2 Difficulties with work or household activities

Functional status measures provide insight into an individuals' ability to perform tasks related to paid work and household activities over the recent past. Work and home life are the two core components of what the majority of individuals place a high value on (Beauregard 2007, Canadian Fitness and Lifestyle Research Institute 1997, Glynn 2000). Obtaining functional status measures also provides the researcher an opportunity to correlate this finding with levels of economic productivity at a population level.

In order to measure the impact of health on a person's functioning, participants were asked how much difficulty on average they have in carrying out work or household activities because of a health condition in the last 30 days. Table 3.9.1.2.1 reflects the

Table 3.9.1.2.1: Reported overall self-rated difficulty with work or household activities in the 30 days preceding the interview among all participants aged 15 years and older, percentage distribution by sex, age, locality, province and race, South Africa 2012

Background characteristics	None		Mild		Moderate		Severe		Extreme/can't do		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	
Sex											
Male	77.2	[74.7–79.6]	14	[12.2–15.9]	6.5	[5.2–8.0]	1.3	[1.0–1.8]	1.0	[0.7–1.5]	6 274
Female	71.8	[69.5–74.0]	16.9	[15.3–18.6]	8.6	[7.4–9.8]	2.1	[1.6–2.7]	0.6	[0.5–0.9]	8 894
Total	74.4	[72.2–76.4]	15.5	[14.1–17.1]	7.6	[6.5–8.7]	1.7	[1.4–2.1]	0.8	[0.6–1.1]	15 168
Age											
15–24	82.8	[80.5–84.9]	12.2	[10.6–14.0]	3.9	[2.9–5.1]	0.7	[0.5–1.2]	0.4	[0.2–0.9]	4 292
25–34	79.6	[76.3–82.5]	13.4	[11.4–15.8]	5.6	[4.0–7.8]	0.7	[0.4–1.3]	0.7	[0.3–1.5]	2 980
35–44	74.6	[71.5–77.5]	15.1	[12.9–17.5]	7.9	[6.2–9.9]	1.6	[1.0–2.5]	0.9	[0.5–1.7]	2 481
45–54	69.4	[65.4–73.2]	18.0	[15.4–20.9]	9.5	[7.7–11.7]	2.6	[1.6–3.9]	0.5	[0.2–1.4]	2 273
55–64	63.5	[58.6–68.1]	20.9	[18.0–24.1]	11.5	[9.5–14.0]	2.9	[2.1–4.0]	1.2	[0.7–2.1]	1 736
65+	46.8	[41.0–52.7]	25.1	[21.2–29.4]	19	[15.3–23.4]	6.3	[4.5–8.8]	2.8	[1.9–4.1]	1 402
Total	74.4	[72.2–76.4]	15.5	[14.1–17.1]	7.6	[6.5–8.7]	1.7	[1.4–2.1]	0.8	[0.6–1.1]	15 164
Locality											
Urban formal	76.3	[73.0–79.4]	13.6	[11.5–15.9]	7.7	[6.1–9.7]	1.6	[1.1–2.2]	0.8	[0.5–1.2]	8 217
Urban informal	73.1	[68.8–77.1]	17.1	[14.1–20.5]	7.5	[6.0–9.5]	1.6	[0.9–2.8]	0.7	[0.3–1.4]	1 880
Rural formal	81.0	[75.4–85.5]	13.6	[10.5–17.4]	4.2	[2.6–6.7]	0.7	[0.3–1.3]	0.6	[0.2–1.9]	1 852
Rural informal	68.3	[65.3–71.1]	19.9	[17.3–22.8]	8.2	[7.0–9.7]	2.4	[1.8–3.2]	1.1	[0.8–1.6]	3 225
Total	74.4	[72.2–76.4]	15.5	[14.1–17.1]	7.6	[6.5–8.7]	1.7	[1.4–2.1]	0.8	[0.6–1.1]	15 174
Province											
Western Cape	81.1	[77.1–84.6]	10.3	[8.0–13.1]	6.9	[5.1–9.2]	0.9	[0.4–2.1]	0.8	[0.4–1.5]	2 143
Eastern Cape	71.1	[67.0–74.8]	16.9	[14.2–20.0]	8.4	[6.4–11.1]	2.7	[1.8–4.0]	0.9	[0.5–1.7]	1 620
Northern Cape	80.2	[74.6–84.8]	12.3	[9.4–16.0]	5.4	[3.5–8.2]	1	[0.4–2.8]	1.1	[0.4–2.7]	993
Free State	67.4	[61.0–73.3]	15.4	[11.9–19.7]	11.6	[8.7–15.4]	4.3	[2.5–7.2]	1.3	[0.4–3.8]	820
KwaZulu-Natal	70.9	[65.9–75.4]	16.4	[13.7–19.6]	9.0	[6.4–12.6]	2.4	[1.6–3.4]	1.3	[0.8–2.2]	2 509
North West	74.5	[69.8–78.7]	16.7	[13.5–20.6]	7.2	[5.5–9.5]	1.3	[0.8–2.1]	0.2	[0.1–0.9]	1 921
Gauteng	77.4	[71.9–82.1]	14.3	[11.0–18.3]	6.6	[4.4–9.9]	1.2	[0.6–2.2]	0.5	[0.2–1.2]	2 599
Mpumalanga	69.7	[64.0–74.8]	18.5	[14.2–23.8]	8.7	[6.7–11.2]	1.6	[1.0–2.6]	1.5	[0.8–2.7]	1 326
Limpopo	71.0	[64.6–76.6]	20.5	[15.5–26.6]	6.0	[4.7–7.6]	1.5	[0.8–2.9]	1.1	[0.6–2.1]	1 243
Total	74.4	[72.2–76.4]	15.5	[14.1–17.1]	7.6	[6.5–8.7]	1.7	[1.4–2.1]	0.8	[0.6–1.1]	15 174
Race											
African	72.0	[69.4–74.5]	17.1	[15.3–18.9]	8.2	[6.9–9.6]	1.9	[1.5–2.4]	0.9	[0.6–1.2]	10 069
White	85.2	[79.9–89.4]	9.9	[6.9–14.0]	3.5	[1.8–7.0]	0.9	[0.4–2.1]	0.5	[0.1–1.9]	709
Coloured	81.2	[78.4–83.7]	10.2	[8.3–12.3]	7.0	[5.5–8.8]	0.9	[0.6–1.5]	0.7	[0.5–1.2]	3 051
Asian/Indian	77.2	[71.6–82.0]	10.7	[8.0–14.0]	8.1	[6.3–10.4]	2.4	[1.2–5.0]	1.6	[0.6–4.2]	1 292
Total	74.4	[72.2–76.4]	15.5	[14.1–17.1]	7.6	[6.5–8.7]	1.7	[1.4–2.1]	0.8	[0.6–1.1]	15 121

95% CI: 95% confidence interval

percentage of participants, which is also represented in graphic form, self-rated difficulty in carrying out work or household activities. About 25.6% had at least some difficulty with work or household activities, with most within that group rating their difficulty as mild (15.5%). The proportion of those with severe (1.7%) and extreme difficulty was generally low at 0.8%. There was variation in severe self-reported difficulty in functioning among provinces, ranging from 4.3% in the Free State to 1.3% in North West, Gauteng (1.2%) and Western Cape (0.9%). The Indian population seemed to have higher self-reported difficulty in functioning than the other race groups.

The following results were significantly different at a 5%-level for the following: the younger age groups reported less mild, moderate severe difficulties with work or household activities than the older age groups, especially those from 55 years and older (see Table 3.9.1.2.1); participants living in the rural informal areas (19.9%) reported higher levels of mild difficulty than those in the urban formal areas (13.6%). Provincial differences show the following: Western Cape reported lower levels of mild difficulty (10.3%) as compared to KwaZulu-Natal (16.4%), North West (16.7%), Mpumalanga (18.5%) and Limpopo (20.5%); Northern Cape reported lower levels of moderate difficulty (5.4%) than Free State (11.6%); and Western Cape reported significantly lower levels of severe difficulty (0.9%) as compared to Free State (4.3%).

When the data was disaggregated by sex, the following was found to be significant with respect to work and household activities: Among males 22.8% had at least some difficulty with work or household activities, with most within that group rating their difficulty as mild (Table 3.9.1.2.2). The age trend was similar to the combined sample for mild (14.0%) and moderate difficulties, with the younger ages reporting less difficulty than the older. The variation in self-reported difficulty in functioning among provinces was similar to the total sample with Northern Cape (3.6%) reporting lower levels of moderate difficulty than Free State (10.4%). For females the trends were similar to the total sample (Table 3.9.1.2.3). However, there were provincial differences for severe difficulties were as follows: Western Cape reported significantly lower levels (0.5%) compared to KwaZulu-Natal (3.1%) and Free State (4.4%).

Figure 3.9.1.2.1: Self-rated difficulty with work or household activities in the 30 days preceding the interview, South Africa 2012

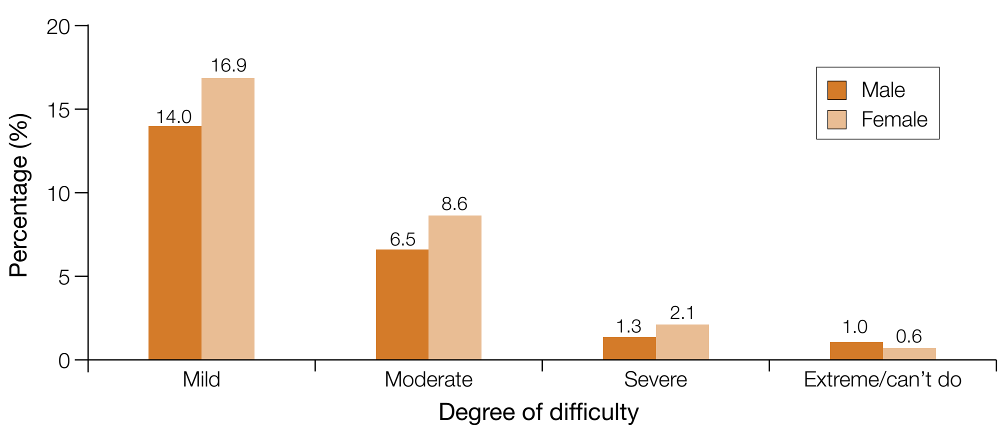


Table 3.9.1.2.2: Reported overall self-rated difficulty with work or household activities in the 30 days preceding the interview among male participants aged 15 years and older, percentage distribution by age and province, South Africa 2012

Background characteristics	None		Mild		Moderate		Severe		Extreme / can't do		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	
Age											
15–24	84.7	[81.9–87.2]	11	[8.9–13.5]	3.2	[2.1–4.8]	0.4	[0.2–0.8]	0.7	[0.3–1.6]	1 974
25–34	80.8	[76.1–84.7]	12.3	[9.6–15.7]	5.0	[3.0–8.4]	0.7	[0.3–1.7]	1.1	[0.4–3.1]	1 247
35–44	74.4	[69.6–78.7]	14.5	[11.4–18.1]	8.1	[5.6–11.5]	1.6	[0.8–3.2]	1.4	[0.7–2.9]	960
45–54	73.8	[69.2–77.9]	16.7	[13.5–20.5]	7.1	[5.2–9.7]	2.3	[1.2–4.5]	0.1	[0.0–0.4]	894
55–64	67.9	[61.8–73.5]	17.1	[13.3–21.6]	11.6	[8.9–15.0]	1.9	[1.1–3.3]	1.5	[0.6–3.5]	717
65+	54.0	[46.8–61.0]	24.0	[18.6–30.4]	14.8	[10.6–20.3]	4.4	[2.1–8.9]	2.8	[1.6–4.9]	477
Total	77.2	[74.7–79.6]	14.0	[12.2–15.9]	6.5	[5.2–8.0]	1.3	[1.0–1.8]	1.0	[0.7–1.5]	6 269
Province											
Western Cape	83.0	[78.2–86.9]	9.4	[6.6–13.3]	5.4	[3.7–7.8]	1.4	[0.5–4.1]	0.8	[0.4–1.7]	908
Eastern Cape	76.2	[70.7–80.9]	14.0	[10.3–18.7]	6.0	[4.0–8.9]	2.6	[1.4–4.8]	1.2	[0.5–2.8]	677
Northern Cape	84.2	[77.7–89.1]	10.7	[6.8–16.4]	3.6	[2.1–6.1]	0.1	[0.0–0.9]	1.3	[0.3–6.1]	412
Free State	71.9	[63.8–78.7]	12.9	[8.3–19.3]	10.4	[6.6–15.9]	4.1	[2.3–7.5]	0.8	[0.2–3.3]	342
Kwazulu-Natal	74.9	[69.2–80.0]	14.6	[11.0–19.1]	7.1	[4.7–10.5]	1.4	[0.7–2.7]	1.9	[0.9–4.0]	1 061
North West	80.1	[75.1–84.3]	11.9	[8.5–16.5]	6.8	[4.8–9.5]	0.8	[0.3–2.4]	0.4	[0.1–1.2]	751
Gauteng	77.4	[70.9–82.8]	14.4	[10.7–19.2]	6.5	[3.8–10.9]	0.7	[0.3–1.8]	0.9	[0.4–2.4]	1 107
Mpumalanga	72.8	[65.2–79.2]	15.5	[11.0–21.4]	8.8	[6.2–12.4]	1.1	[0.6–2.3]	1.8	[0.7–4.7]	531
Limpopo	76.1	[67.8–82.7]	19.3	[13.3–27.2]	3.6	[2.0–6.1]	0.8	[0.3–1.9]	0.3	[0.1–0.9]	485
Total	77.2	[74.7–79.6]	14.0	[12.2–15.9]	6.5	[5.2–8.0]	1.3	[1.0–1.8]	1.0	[0.7–1.5]	6 274

95% CI: 95% confidence interval

Table 3.9.1.2.3: Reported overall self-rated difficulty with work or household activities in the 30 days preceding the interview among female participants aged 15 years and older, percentage distribution by age and province, South Africa 2012

Background characteristics	None		Mild		Moderate		Extreme/can't do		Severe		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	
Age											
15–24	80.9	[77.9–83.6]	13.4	[11.5–15.5]	4.5	[3.1–6.4]	1.1	[0.6–1.9]	0.1	[0.0–0.4]	2 316
25–34	78.4	[74.9–81.6]	14.4	[12.1–17.2]	6.2	[4.6–8.2]	0.7	[0.3–1.7]	0.3	[0.1–0.5]	1 733
35–44	74.8	[71.5–77.8]	15.6	[13.0–18.5]	7.6	[5.9–9.8]	1.5	[0.9–2.5]	0.5	[0.3–1.2]	1 520
45–54	65.7	[61.1–70.0]	19.1	[16.2–22.5]	11.5	[9.2–14.3]	2.7	[1.7–4.5]	0.9	[0.3–2.5]	1 377
55–64	59.9	[54.5–65.0]	24.0	[20.3–28.2]	11.5	[8.9–14.6]	3.7	[2.5–5.5]	1.0	[0.5–1.8]	1 018
65+	42.8	[35.9–49.9]	25.7	[21.4–30.5]	21.4	[17.1–26.5]	7.4	[5.0–10.8]	2.8	[1.6–4.7]	925
Total	71.8	[69.5–74.0]	16.9	[15.3–18.6]	8.6	[7.4–9.8]	2.1	[1.6–2.7]	0.6	[0.5–0.9]	8 889
Province											
Western Cape	79.4	[74.5–83.6]	11.0	[8.4–14.4]	8.3	[5.9–11.5]	0.5	[0.2–1.2]	0.8	[0.3–2.2]	1 235
Eastern Cape	66.4	[62.2–70.3]	19.5	[16.9–22.5]	10.7	[8.1–14.0]	2.8	[1.7–4.5]	0.6	[0.3–1.5]	939
Northern Cape	76.3	[70.0–81.6]	13.9	[10.6–18.0]	7.1	[4.4–11.4]	1.9	[0.6–5.5]	0.8	[0.3–1.9]	581
Free State	63.2	[56.4–69.5]	17.8	[13.6–23.0]	12.8	[9.4–17.3]	4.4	[2.3–8.4]	1.7	[0.6–4.9]	478
KwaZulu-Natal	67.6	[62.2–72.5]	17.8	[14.6–21.6]	10.6	[7.3–15.1]	3.1	[2.0–4.8]	0.9	[0.4–1.8]	1 448
North West	69.8	[64.0–75.1]	20.7	[16.7–25.4]	7.6	[5.5–10.5]	1.7	[0.9–3.0]	0.1	[0.0–0.8]	1 170
Gauteng	77.4	[71.5–82.4]	14.2	[10.7–18.4]	6.7	[4.6–9.8]	1.7	[0.8–3.3]	0.0	[0.0–0.2]	1 491
Mpumalanga	67.1	[61.7–72.0]	21.1	[16.1–27.2]	8.6	[6.4–11.5]	2.0	[1.2–3.3]	1.2	[0.5–2.8]	794
Limpopo	67.1	[60.9–72.7]	21.4	[16.4–27.4]	7.8	[6.0–10.0]	2.1	[1.0–4.3]	1.7	[0.8–3.4]	758
Total	71.8	[69.5–74.0]	16.9	[15.3–18.6]	8.6	[7.4–9.8]	2.1	[1.6–2.7]	0.6	[0.5–0.9]	8 894

95% CI: 95% confidence interval

3.9.2 WHODAS and activities of daily living

Disability scores in relation to activities of daily living are presented in this section.

3.9.2.1 Disability (WHODAS)

The WHO–Disability Assessment Scale (DAS) score provides an indication of the overall level of self-reported disability in the 30 days preceding the interview at the time the survey was conducted. It is expected that the level of disability will increase with age. In SANHANES-1, a very low level of disability was reported at all ages, including the middle- and older age group although the results show a trend of increasing disability with age. Reported levels were low with a mean of 2.5% for both males and females with females reporting a slightly higher level of disability at 2.9% and those in the 65 years and older group reporting the highest level of disability at 7.6% (Table 3.9.2.1.1 and Figure 3.9.2.1.1).

Table 3.9.2.1.1: Mean WHODAS scores (12 items) for all participants aged 15 years and older in the 30 days preceding the interview by sex, age, locality, province and race, South Africa 2012

Background characteristics	Males			Females			Combined		
	Mean	95% CI	Total	Mean	95% CI	Total	Mean	95% CI	Total
Sex									
Male	2.0	[1.8–2.3]	5 883				2.0	[1.8–2.3]	5 883
Female				2.9	[2.6–3.2]	8 331	2.9	[2.6–3.2]	8 331
Total	**2.0**	**[1.8–2.3]**	**5 883**	**2.9**	**[2.6–3.2]**	**8 331**	**2.5**	**[2.3–2.7]**	**14 214**
Age									
15–24	1.7	[1.3–2.0]	1 855	1.7	[1.4–2.0]	2 176	1.7	[1.4–2.0]	4 033
25–34	1.3	[1.0–1.7]	1 200	1.8	[1.5–2.1]	1 647	1.6	[1.3–1.8]	2 847
35–44	2.0	[1.5–2.5]	903	2.3	[1.9–2.7]	1 442	2.1	[1.8–2.5]	2 346
45–54	2.1	[1.7–2.4]	841	3.5	[3.0–4.0]	1 292	2.8	[2.5–3.2]	2 135
55–64	3.0	[2.3–3.7]	655	4.6	[4.0–5.2]	947	3.9	[3.4–4.4]	1 603
65+	6.0	[4.8–7.2]	424	8.5	[7.3–9.6]	823	7.6	[6.7–8.5]	1 247
Total	**2.0**	**[1.8–2.3]**	**5 878**	**2.9**	**[2.6–3.2]**	**8 327**	**2.5**	**[2.3–2.7]**	**14 211**
Locality									
Urban formal	1.9	[1.5–2.2]	3 214	2.7	[2.3–3.1]	4 438	2.3	[2.0–2.6]	7 654
Urban informal	2.0	[1.4–2.6]	675	2.4	[1.8–3.0]	1 063	2.2	[1.7–2.8]	1 739
Rural formal	1.3	[0.8–1.8]	806	2.0	[1.4–2.7]	962	1.6	[1.1–2.2]	1 768
Rural informal	2.7	[2.2–3.1]	1 188	3.7	[3.2–4.1]	1 868	3.2	[2.8–3.6]	3 059
Total	2.0	[1.8–2.3]	5 883	2.9	[2.6–3.2]	8 331	2.5	[2.3–2.7]	14 220
Province									
Western Cape	1.2	[0.7–1.7]	862	1.5	[1.1–1.9]	1 178	1.4	[1.0–1.8]	2 040
Eastern Cape	2.4	[1.6–3.2]	648	2.9	[2.3–3.4]	875	2.6	[2.0–3.2]	1 527
Northern Cape	2.7	[1.7–3.7]	394	3.3	[2.4–4.2]	558	3.0	[2.2–3.9]	952
Free State	2.4	[1.7–3.1]	289	3.8	[2.9–4.7]	416	3.1	[2.4–3.8]	705
KwaZulu-Natal	2.5	[1.9–3.2]	982	3.6	[2.9–4.3]	1 340	3.1	[2.5–3.8]	2 322
North West	2.0	[1.4–2.6]	713	2.8	[2.3–3.3]	1 112	2.4	[2.0–2.9]	1 825
Gauteng	1.6	[1.1–2.1]	1 027	2.4	[1.8–2.9]	1 391	2.0	[1.5–2.4]	2 419
Mpumalanga	3.5	[2.5–4.4]	498	4.3	[3.4–5.1]	739	3.9	[3.1–4.7]	1 238
Limpopo	2.3	[1.6–3.1]	470	3.8	[3.1–4.6]	722	3.2	[2.5–3.8]	1 192
Total	2.0	[1.8–2.3]	5 883	2.9	[2.6–3.2]	8 331	2.5	[2.3–2.7]	14 220

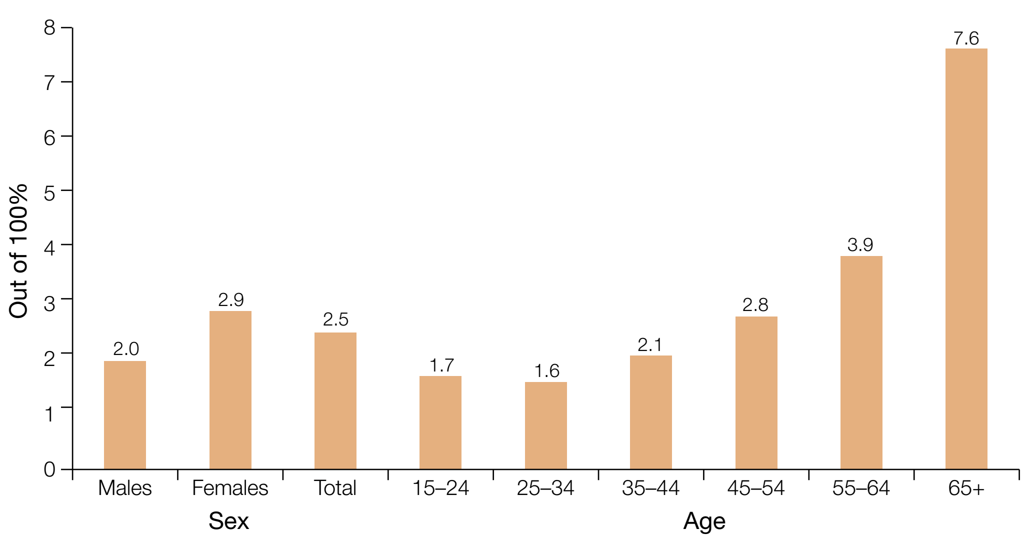
Race									
African	2.2	[1.9–2.5]	3 810	3.1	[2.7–3.4]	5 599	2.6	[2.4–2.9]	9 412
White	1.8	[1.2–2.5]	306	2.5	[1.6–3.3]	364	2.2	[1.6–2.8]	670
Coloured	1.1	[0.8–1.4]	1 188	2.0	[1.7–2.4]	1 696	1.6	[1.3–1.9]	2 885
Asian/Indian	1.8	[1.1–2.4]	551	2.5	[1.9–3.2]	654	2.2	[1.6–2.7]	1 205
Total	2.0	[1.8–2.3]	5 855	2.9	[2.6–3.2]	8 313	2.5	[2.3–2.7]	14 172

95% CI: 95% confidence interval

The significant differences found at a 5%-level are as follows: the age group 15–24 years (1.7%) and 25–34 years (1.6%) being lower than the 45–54 years (2.8%), 55–64 years (3.9%) and 65 years and older (7.6%) age groups; the rural informal (3.2%) has a higher level of disability than the urban formal (2.3%) and the rural formal (1.6%); black African (2.6%) is higher than coloureds (1.6%); Western Cape (1.4%) has lower disability than Eastern Cape (2.6%), Northern Cape (3%), Free State (3.1%), KwaZulu-Natal (3.1%), North West (2.4%), Mpumalanga (3.9%), and Limpopo (3.2%), and finally, Mpumalanga has a higher level of disability than Gauteng (2%).

When the data is disaggregated by sex, the significant findings for males indicate that each younger age category is significantly lower on disability than the older age categories; the 15–24 year group is lower than the group for 55 years and older, the 25–34 year group is lower than the group for 45 years and older, and so on. Males in the rural formal (1.3%) areas have lower levels of disability than those residing in rural informal areas (2.7%); black African males (2.2%) have higher disability than Coloured males (1.1%); and finally, males in the Western Cape (1.2%) have lower levels of disability than those in KwaZulu-Natal (2.5%), and Mpumalanga (3.5%). Female participants showed the same trends with respect to age as males with older women reporting significantly more disability; those residing in rural informal areas (3.7%) reporting higher levels than urban informal areas (2.4%), those in rural informal areas having higher levels than those in rural formal areas (2%); and finally, black African females reporting higher disability than coloured females (2%).

Figure 3.9.2.1.1 WHODAS scores for participants aged 15 years and older by sex and age, South Africa 2012



3.9.2.2 *Activities of daily living (ADL)*

The ability to carry out activities of daily living is essential for an adequate level of overall independent functioning. There is a correlation between disability (measured by WHODAS) and ADL so it is expected that self-reported inability to carry out day-to-day activities will result in a higher level of disability.

In this survey of the total sample, 70.8% of the participants do not have any difficulty in carrying out daily activities and males are more likely to have no difficulties compared to females (75.8% and 66.3%, respectively) (Table 3.9.2.2.1 and Table 3.9.2.2.2). As expected, the number of daily living activity limitations significantly increased with age, for instance, the age group 65 years and older were more likely to experience more than two limitations in carrying out their daily activities while those in the age group between 55 and 65 years were more likely to experience at least one activity limitation compared to younger groups. This was the same among both males and females but females were more likely to experience two or more activity limitations compared to males (27% and 18.5%, respectively).

Living in a rural formal area was related to no difficulties (78%) in carrying out daily activities and this was significantly different at a 5%-level to those living in a rural informal area (66.5%). Those living in a rural informal area (27.5%) were significantly different to the rural formal (17.1%) with respect to at least two or more difficulties. Overall, living in Western Cape was significantly associated with no difficulties in carrying out daily activities compared to (of the nine) South African provinces while there was no significant difference between Western Cape (81.3%) and Gauteng (75.5%). Black Africans had significantly less than the other race groups with respect having no difficulties in carrying out daily activities. Black Africans (23.9%) also had significantly more difficulties as compared to other race groups with respect to carrying out two or more activities of daily living. Rural formal (17.1%) is less than rural informal (27.5%) for two or more activities.

Males living in Western Cape (11.6%) have significantly less difficulties in the two or more activities of daily living category compared to all other provinces except North West (16.4%) and Gauteng (14.5%). Black African males (19.5%) had more difficulty than coloured males (12%) for the two or more category for activities of daily living. Females show a similar profile to males with respect to province and race.

Although not statistically significant, in the overall sample, being white (71.9%) was associated with no difficulty in carrying out daily activities. However, among males, the coloured race (83.1%) was associated with no difficulties in carrying out daily activities and this was statistically significant compared to the black African race (75.0%) while among females, the ‘other’ race group was associated with no difficulties but this was not statistically significant compared to other groups.

Table 3.9.2.2.1: Difficulty in carrying out activities of daily living (ADL) (9 items) in the 30 days preceding the interview among all participants aged 15 years and older, percentage distribution by sex, age, locality, province and race, South Africa 2012

Background characteristics	Number of activities of daily living limitations						
	Zero		One		Two or more		Total
	%	95% CI	%	95% CI	%	95% CI	
Sex							
Male	75.8	[73.2–78.2]	5.7	[4.7–6.9]	18.5	[16.5–20.7]	6 015
Female	66.3	[63.7–68.8]	6.7	[5.8–7.8]	27.0	[24.7–29.4]	8 507
Total	70.8	[68.4–73.0]	6.2	[5.5–7.1]	23.0	[21.0–25.1]	14 522
Age							
15–24	79.2	[76.4–81.7]	5.5	[4.6–6.5]	15.3	[13.1–17.9]	4 127
25–34	78.3	[75.0–81.2]	6.5	[5.1–8.3]	15.2	[12.8–18.0]	2 883
35–44	74.0	[70.8–76.9]	6.3	[5.1–7.9]	19.7	[16.9–22.7]	2 385
45–54	63.9	[59.7–67.9]	7.1	[5.3–9.4]	29.0	[25.5–32.9]	2 174
55–64	55.1	[50.6–59.5]	6.9	[5.0–9.5]	38.0	[33.9–42.3]	1 642
65 and above	35.6	[30.2–41.4]	5.7	[4.3–7.6]	58.6	[53.2–63.8]	1 308
Total	70.8	[68.4–73.0]	6.2	[5.5–7.1]	23.0	[21.0–25.1]	14 519
Locality							
Urban formal	71.4	[67.7–74.8]	6.6	[5.4–8.0]	22.0	[19.1–25.2]	7 809
Urban informal	72.5	[67.2–77.2]	5.8	[4.4–7.7]	21.7	[17.7–26.2]	1 797
Rural formal	78.0	[71.0–83.7]	4.8	[3.3–7.1]	17.1	[12.6–22.8]	1 785
Rural informal	66.5	[63.4–69.5]	6.0	[5.0–7.2]	27.5	[24.5–30.7]	3 137
Total	70.8	[68.4–73.0]	6.2	[5.5–7.1]	23.0	[21.0–25.1]	14 528
Province							
Western Cape	81.3	[78.2–84.0]	4.8	[3.4–6.7]	14.0	[11.4–17.0]	2 066
Eastern Cape	68.1	[63.2–72.6]	5.1	[3.9–6.6]	26.9	[22.7–31.4]	1 566
Northern Cape	60.1	[51.9–67.8]	10.9	[7.8–14.8]	29.0	[23.3–35.4]	969
Free State	61.4	[55.3–67.2]	5.8	[4.2–8.0]	32.7	[27.4–38.6]	758
KwaZulu-Natal	63.8	[57.9–69.4]	6.2	[4.7–8.0]	30.0	[24.6–36.0]	2 398
North West	72.9	[68.7–76.7]	5.8	[4.5–7.4]	21.3	[18.0–25.1]	1 847
Gauteng	75.5	[69.7–80.4]	7.0	[5.1–9.4]	17.6	[13.9–22.0]	2 458
Mpumalanga	69.00	[63.4–74.1]	5.4	[3.8–7.6]	25.6	[20.9–31.0]	1 257
Limpopo	63.3	[57.6–68.6]	7.2	[5.3–9.7]	29.6	[24.0–35.8]	1 209
Total	70.8	[68.4–73.0]	6.2	[5.5–7.1]	23.0	[21.0–25.1]	14 528
Race							
African	69.9	[67.0–72.6]	6.2	[5.4–7.2]	23.9	[21.5–26.4]	9 639
White	71.9	[65.3–77.8]	7.3	[4.8–11.0]	20.8	[16.2–26.3]	680
Coloured	77.7	[74.8–80.4]	5.2	[4.1–6.5]	17.1	[14.8–19.6]	2 924
Asian/Indian	68.4	[57.6–77.6]	6.1	[3.5–10.5]	25.5	[16.6–37.1]	1 236
Total	70.8	[68.4–73.0]	6.2	[5.5–7.1]	23	[21.0–25.1]	14 479

95% CI: 95% confidence interval

Table 3.9.2.2.2: Difficulty in carrying out activities of daily living (ADL) (9 items) in the 30 days preceding the interview among all participants aged 15 years and older, by age, province and race, South Africa 2012

Background characteristics	Number of activities of daily living limitations													
	Male							Female						
	Zero		One		Two or more		Total	Zero		One		Two or more		Total
	%	95% CI	%	95% CI	%	95% CI		%	95% CI	%	95% CI	%	95% CI	
Age														
15–24	81.3	[78.2–84.1]	4.4	[3.4–5.8]	14.2	[11.6–17.3]	1 898	77.0	[73.7–80.0]	6.5	[5.2–8.0]	16.5	[13.7–19.6]	2227
25 –34	81.3	[77.5–84.7]	6.5	[4.6–9.2]	12.1	[9.4–15.5]	1 215	75.4	[71.2–79.1]	6.5	[4.8–8.7]	18.2	[15.0–21.8]	1668
35–44	77.9	[73.3–82.0]	5.3	[3.6–7.7]	16.8	[13.2–21.0]	923	70.4	[66.6–73.9]	7.3	[5.6–9.5]	22.3	[19.0–26.0]	1461
45–54	70.3	[65.1–75.0]	6.3	[3.7–10.4]	23.4	[18.9–28.6]	855	58.4	[53.7–63.0]	7.7	[5.3–11.1]	33.8	[29.7–38.2]	1317
55–64	64.3	[56.9–71.1]	7.3	[4.4–11.7]	28.4	[22.9–34.7]	676	47.7	[42.3–53.2]	6.7	[4.6–9.6]	45.6	[39.9–51.4]	965
65 and above	42.4	[34.8–50.4]	6.8	[4.3–10.5]	50.8	[43.1–58.5]	443	31.8	[25.2–39.3]	5.2	[3.7–7.2]	63.0	[56.0–69.5]	865
Total	75.8	[73.2–78.2]	5.7	[4.7–6.9]	18.5	[16.5–20.7]	6 010	66.3	[63.7–68.8]	6.7	[5.8–7.8]	27.0	[24.7–29.4]	8 503
Province														
Western Cape	82.6	[78.4–86.2]	5.8	[3.5–9.4]	11.6	[8.5–15.5]	876	80.0	[76.2–83.4]	3.9	[2.6–5.6]	16.1	[12.9–19.9]	1 190
Eastern Cape	72.1	[65.4–77.9]	4.9	[3.2–7.2]	23.1	[17.8–29.4]	662	64.3	[59.8–68.6]	5.3	[3.9–7.1]	30.4	[26.5–34.5]	900
Northern Cape	63.7	[53.1–73.1]	11.1	[7.0–17.2]	25.2	[18.5–33.3]	399	56.7	[48.6–64.5]	10.6	[7.9–14.2]	32.7	[25.7–40.4]	570
Free State	63.8	[54.2–72.4]	6.2	[4.0–9.4]	30/0	[22.4–38.8]	314	59.1	[52.8–65.2]	5.5	[3.8–7.8]	35.4	[29.3–42.0]	444
KwaZulu-Natal	70.8	[64.3–76.5]	6.0	[4.1–8.6]	23.2	[17.5–30.1]	1 017	58.1	[51.1–64.8]	6.3	[4.9–8.1]	35.5	[29.1–42.5]	1 381
North West	79.0	[73.0–84.0]	4.6	[3.2–6.6]	16.4	[12.2–21.7]	723	67.8	[63.4–71.9]	6.8	[5.2–8.7]	25.4	[21.5–29.8]	1 124
Gauteng	79.9	[73.9–84.8]	5.6	[3.5–9.0]	14.5	[10.9–18.9]	1 044	71.1	[64.6–76.8]	8.3	[5.9–11.5]	20.6	[16.1–26.0]	1 413
Mpumalanga	75.7	[69.5–81.0]	3.4	[2.0–5.8]	20.9	[16.2–26.5]	506	63.2	[57.1–69.0]	7.0	[4.9–10.1]	29.7	[24.2–35.9]	750
Limpopo	70.9	[64.1–76.9]	7.6	[5.2–11.0]	21.5	[15.6–28.8]	474	57.5	[51.1–63.6]	6.8	[4.7–9.9]	35.7	[29.2–42.7]	735
Total	75.8	[73.2–78.2]	5.7	[4.7–6.9]	18.5	[16.5–20.7]	6 015	66.3	[63.7–68.8]	6.7	[5.8–7.8]	27.0	[24.7–29.4]	8 507
Race														
African	75.0	[71.9–77.8]	5.5	[4.5–6.8]	19.5	[17.1–22.2]	3 906	65.3	[62.3–68.3]	6.8	[5.8–8.0]	27.8	[25.2–30.6]	5 730
White	76.4	[68.3–82.9]	7.7	[4.0–14.3]	16.0	[10.8–23.0]	311	68	[59.3–75.6]	7.0	[4.0–12.0]	25.0	[18.0–33.7]	369
Coloured	83.1	[79.7–86.0]	4.9	[3.5–6.9]	12.0	[9.7–14.7]	1 206	73.1	[69.3–76.5]	5.4	[4.2–7.1]	21.5	[18.5–24.9]	1 717
Asian/Indian	72.5	[61.7–81.3]	5.5	[3.0–9.8]	21.9	[13.5–33.6]	563	64.3	[52.2–74.7]	6.7	[3.5–12.3]	29.1	[19.0–41.7]	673
Total	75.8	[73.2–78.2]	5.7	[4.7–6.9]	18.5	[16.5–20.7]	5 986	66.3	[63.7–68.8]	6.7	[5.8–7.8]	27.0	[24.7–29.4]	8 489

95% CI: 95% confidence interval

3.9.3 Vision and hearing

The ability to see and hear is fundamental to adequate social and occupational functioning (Jang, Mortimer, Haly et al. 2003; Du Feu & Fergusson 2003; Brennan, Horowitz & Su 2005). If visual and hearing impairment is not diagnosed at an early age in those affected, it can have disastrous consequences for an individual's emotional and social development, as well his/her cognitive development (Wallhagen, Strawbridge, Shema et al. 2001; Wahl, Heyl, Drapaniotis et al. 2013). The percentage of the population that reported on the prevalence of impaired vision and hearing were: Using glasses or contact lenses to see far away (12.1%), using glasses or contact lenses to see close up (14.1%) and using hearing aids (9.5%).

3.9.3.1 Self-report on using glasses or contact lenses for near-sightedness

The following were found to be significant at a 5% level for self-report of near-sightedness: the age categories 15–24, 25–35 and 35–44 years had significantly lower prevalence of near-sightedness as compared to the age categories 45–54, 55–64, and 65 years and older; those aged 15–24 (4.9%) had a lower prevalence than those aged 35–44 (8.1%), 45–54 (19.5%), 55–64 (32.3%) and 65 years and over (34.8%); participants from the urban formal areas (16.2%) had higher prevalence for near-sightedness than participants from the urban informal (5.2%), rural informal (6.2%) and rural formal areas (9.4%); black Africans had a lower prevalence (7.8%) than whites (32.7%), coloureds (18.9%) and Indians (32%); and finally whites and Indians reported higher prevalence figures than coloureds (Table 3.9.3.1.1).

Moreover, the following significant differences were found at provincial level for the prevalence of near-sightedness: Western Cape (24.1%) and Northern Cape (19.2%) were significantly higher than North West (7.1%), Gauteng (8%), Mpumalanga (9.%) and Limpopo (7.3%); Western Cape, Northern Cape (19.2%) and KwaZulu-Natal (16.7%) was significantly higher than North West (7.1%), Gauteng (8.0%) and Limpopo (7.3%).

The following was found to be significant for near-sightedness for both males and females: there was deterioration with age; participants living in urban formal areas had a higher prevalence than participants living in other areas; black Africans had lower prevalence than whites, coloureds and Indians (Table 3.9.3.1.2 and Table 3.9.3.1.3).

3.9.3.2 Self-report on using glasses or contact lenses to see close up (far-sightedness)

The significant findings for the prevalence of far-sightedness was as follows: the age group of 15–24 years (7.2%) was significantly lower than the age group 35–44 (11.5%), 45–54 (22.1%), 55–64 (32.5%) and 65 and older (35.2%); participants in the urban formal areas (17.4%) was significantly higher than urban informal (8.2%), and rural informal (9.6%) areas; black Africans had significantly lower prevalence rates (10.3%) than whites (31.4%), coloureds (22%) and Indians (31.8%) (Table 3.9.3.1.1).

Significant differences for far-sightedness at a provincial level were as follows: Western Cape Province (26.9%) had a higher prevalence than Eastern Cape (16%), North West (9.4%), Gauteng (8.5%), Mpumalanga (11.4%) and Limpopo (11.9%); Eastern Cape (16%), Northern Cape (19.2%), Free State (18.8) and KwaZulu-Natal (18.5%) reported higher prevalence than the North West and Gauteng.

When the data for males and females were disaggregated, the following was found to be significant: far-sightedness deteriorated with age; urban formal areas had higher prevalence than the other areas; black Africans had a lower prevalence than whites, coloureds and Indians; and the provincial differences showed that males in Western Cape (27.3%) had higher prevalence than those in Eastern Cape (13.9%), Northern Cape (16.4%), KwaZulu-Natal (15.2%), North West (8.3%), Gauteng (7.3%), Mpumalanga (11.9%) and Limpopo (11.9%) (Table 3.9.3.1.2).

Provincial differences for females were: those in Western Cape (26.5%) had a higher prevalence than those in North West (10.4%), Gauteng (9.6%), Mpumalanga (11%), and Limpopo (11.9%); those in the Eastern Cape (18%) reported a higher prevalence than those in North West and Gauteng; those in the Free State (19.9%) reported a higher prevalence than those in North West; and finally, those in KwaZulu-Natal (21.2%) reported higher prevalence than those in North West, Gauteng and Limpopo (Table 3.9.3.1.3).

3.9.3.3 Self-report on using a hearing aid

In SANHANES-1 collecting self-report data for the use of a hearing aid provides an indication of the prevalence of hearing impairment in the population. In essence knowing if an individual wears a hearing aid is a proxy measure for the level of hearing impairment. The following differences were found for hearing impairment at a 5%-level of significance: Indians (13.5%) had a higher prevalence than coloureds (7.2%); and Free State (14.3%), KwaZulu-Natal (13.6%), Eastern Cape (10.8%), Mpumalanga (10.3%), Limpopo (10.5%), and Western Cape (9%) reported higher prevalence than Northern Cape (4%); Free State and KwaZulu-Natal were higher than Gauteng (Table 3.9.3.1.1).

When disaggregated for sex with respect to the prevalence for hearing impairment, males in Western Cape (10.7%) and Eastern Cape (10.4%) had a higher prevalence of impairment than Northern Cape (2.9%); Free State (13.3%), KwaZulu-Natal (13.6%), Mpumalanga (13.2%), and Limpopo (10.6%) had a higher prevalence than Northern Cape (Table 3.9.3.1.2). The only significant finding for females was that black African females had a higher prevalence (9.1%) than coloured females (6.2%) (Table 3.9.3.1.3).

Table 3.9.3.1.1: Self-reported prevalence of impaired vision and hearing in all participants aged 15 years and older, percentage distribution by sex, age, locality, province and race, South Africa 2012

Background characteristics	Glasses/Contact lenses to see far			Glasses/Contact lenses to see near			Wear hearing aid		
	Yes			Yes			yes		
	%	95% CI	Total	%	95% CI	Total	%	95% CI	Total
Sex									
Male	11.0	[9.5–12.7]	6 251	12.8	[11.3–14.5]	6 231	9.6	[8.4–11.1]	6 011
Female	13.1	[11.5–14.8]	8 857	15.3	[13.8–17.1]	8 798	9.3	[8.1–10.6]	8 510
Total	12.1	[10.7–13.6]	15 108	14.1	[12.8–15.6]	15 029	9.5	[8.4–10.6]	14 521
Age									
15–24	4.9	[4.0–6.0]	4 264	7.2	[6.2–8.5]	4 256	9.4	[8.0–11.1]	4 103
25–34	5.2	[3.9–6.8]	2 969	6.6	[5.5–8.0]	2 950	8.9	[7.4–10.7]	2 859
35–44	8.1	[6.6–9.9]	2 486	11.5	[9.7–13.7]	2 469	9.5	[7.9–11.3]	2 379
45–54	19.5	[16.4–23.0]	2 264	22.1	[18.7–26.0]	2 250	8.6	[6.8–10.7]	2 176
55–64	32.3	[26.7–38.5]	1 730	32.5	[28.2–37.2]	1 715	11.8	[6.6–20.2]	1 659
65 and above	34.8	[29.1–40.9]	1 391	35.2	[29.4–41.4]	1 385	10.3	[6.7–15.4]	1 342
Total	12.1	[10.7–13.6]	15 104	14.1	[12.8–15.6]	15 025	9.5	[8.4–10.6]	14 518
Locality									
Urban formal	16.2	[13.8–18.9]	8 178	17.4	[15.1–20.1]	8 132	9.5	[7.9–11.4]	7 844
Urban informal	5.2	[4.0–6.7]	1 882	8.2	[6.3–10.5]	1 860	10.8	[8.4–13.9]	1 798
Rural formal	9.4	[6.5–13.5]	1 844	11.8	[8.9–15.4]	1 842	7.1	[5.1–9.8]	1 799
Rural informal	6.2	[5.2–7.4]	3 210	9.6	[8.3–11.2]	3 201	9.6	[8.1–11.5]	3 086
Total	12.1	[10.7–13.6]	15 114	14.1	[12.8–15.6]	15 035	9.5	[8.4–10.6]	14 527
Province									
Western Cape	24.1	[19.5–29.3]	2 136	26.9	[22.1–32.2]	2 128	9.0	[6.7–11.8]	2 094
Eastern Cape	13	[9.5–17.4]	1 611	16.0	[12.8–20.0]	1 616	10.8	[8.6–13.3]	1 533
Northern Cape	19.2	[14.3–25.5]	998	19.2	[13.8–25.9]	995	4.0	[2.5–6.6]	968
Free State	15.3	[9.7–23.4]	811	18.8	[12.7–26.9]	816	14.3	[10.0–20.2]	787
KwaZulu-Natal	16.7	[12.1–22.6]	2 500	18.5	[14.4–23.4]	2 472	13.6	[9.6–18.9]	2 358
North West	7.1	[5.2–9.6]	1 909	9.4	[7.1–12.5]	1 897	7.2	[4.9–10.4]	1 852
Gauteng	8.0	[6.0–10.5]	2 591	8.5	[6.6–10.8]	2 569	7.0	[5.5–8.9]	2 490
Mpumalanga	9.0	[6.2–12.8]	1 318	11.4	[8.3–15.5]	1 301	10.3	[7.0–14.8]	1 244
Limpopo	7.3	[5.1–10.3]	1 240	11.9	[9.2–15.2]	1 241	10.5	[8.1–13.5]	1 201
Total	12.1	[10.7–13.6]	15 114	14.1	[12.8–15.6]	15 035	9.5	[8.4–10.6]	14 527
Race									
African	7.8	[6.8–9.0]	10 036	10.3	[9.1–11.6]	9 984	9.2	[8.1–10.3]	9 607
White	32.7	[24.6–42.0]	703	31.4	[24.5–39.3]	702	12.7	[7.6–20.6]	680
Coloured	18.9	[15.7–22.6]	3 030	22.0	[19.1–25.1]	3 023	7.2	[5.6–9.2]	2 956
Asian/Indian	32.0	[27.6–36.6]	1 292	31.8	[27.5–36.3]	1 273	13.5	[9.8–18.4]	1 236
Total	12.1	[10.7–13.6]	15 061	14.1	[12.8–15.6]	14 982	9.5	[8.4–10.6]	14 479

95% CI: 95% confidence interval

Table 3.9.3.1.2: Self-reported prevalence of impaired vision and hearing in male participants aged 15 years and older, percentage distribution by age, locality, province and race, South Africa 2012

Background characteristics	Glasses/contact lenses to see far			Glasses/contact lenses to see near			Wear hearing aid		
	Yes			Yes			Yes		
	%	95% CI	Total	%	95% CI	Total	%	95% CI	Total
Age									
15–24	4.5	[3.2–6.5]	1 962	6.7	[5.4–8.3]	1 963	9.9	[8.0–12.1]	1 899
25–34	4.3	[2.9–6.4]	1 244	4.8	[3.4–6.6]	1 241	9.0	[6.9–11.6]	1 189
35–44	6.4	[4.7–8.9]	960	11.0	[8.4–14.2]	954	9.5	[7.4–12.3]	916
45–54	17.8	[13.9–22.4]	892	19.1	[15.3–23.6]	889	8.7	[6.3–11.9]	862
55–64	34.0	[27.1–41.7]	715	32.4	[27.1–38.3]	708	12.4	[6.6–22.1]	687
65+	39.5	[31.5–48.1]	473	42.4	[34.0–51.3]	471	9.7	[5.9–15.4]	453
Total	11.0	[9.5–12.7]	6 246	12.8	[11.3–14.5]	6 226	9.6	[8.4–11.1]	6 006
Locality									
Urban formal	14.5	[11.9–17.5]	3 432	15.8	[13.3–18.7]	3 422	9.6	[7.8–11.8]	3 297
Urban informal	3.6	[2.4–5.3]	738	6.2	[4.5–8.4]	730	11.7	[8.4–16.0]	704
Rural formal	10.5	[7.3–14.9]	841	11.6	[8.6–15.6]	839	7.5	[5.1–10.9]	819
Rural informal	5.4	[4.2–6.9]	1 240	8.2	[6.7–10.0]	1 240	9.8	[7.6–12.4]	1 191
Total	11.0	[9.5–12.7]	6 251	12.8	[11.3–14.5]	6 231	9.6	[8.4–11.1]	6 011
Province									
Western Cape	23.2	[17.2–30.5]	906	27.3	[21.7–33.6]	902	10.7	[7.3–15.5]	887
Eastern Cape	12.0	[8.1–17.6]	676	13.9	[9.8–19.4]	679	10.4	[7.5–14.1]	643
Northern Cape	14.7	[9.2–22.6]	412	16.4	[10.7–24.3]	411	2.9	[1.6–5.4]	404
Free State	14.8	[7.7–26.7]	336	17.5	[9.9–29.1]	340	13.3	[7.9–21.6]	329
KwaZulu-Natal	14.1	[9.7–20.0]	1 057	15.2	[11.6–19.6]	1 046	13.6	[9.2–19.6]	996
North West	5.5	[3.5–8.5]	747	8.3	[5.8–11.8]	742	6.8	[4.0–11.4]	721
Gauteng	7.1	[5.1–10.0]	1 106	7.3	[5.5–9.7]	1 104	7.1	[5.4–9.4]	1 067
Mpumalanga	8.0	[5.2–12.2]	527	11.9	[8.0–17.3]	523	13.2	[8.6–19.6]	496
Limpopo	8.5	[5.8–12.2]	484	11.9	[8.6–16.2]	484	10.6	[7.5–14.7]	468
Total	11.0	[9.5–12.7]	6 251	12.8	[11.3–14.5]	6 231	9.6	[8.4–11.1]	6 011
Race									
African	6.5	[5.4–7.8]	4 058	8.6	[7.3–10.0]	4 051	9.2	[7.9–10.7]	3 893
White	34.0	[24.3–45.2]	321	32.1	[23.8–41.7]	322	12.3	[6.9–21.1]	309
Coloured	18.8	[13.5–25.6]	1 257	22.2	[18.4–26.5]	1 251	8.4	[5.5–12.6]	1 220
Asian/Indian	24.8	[20.4–29.8]	585	27.3	[21.7–33.7]	577	14.4	[10.6–19.3]	562
Total	11.0	[9.5–12.7]	6 221	12.8	[11.3–14.5]	6 201	9.6	[8.4–11.1]	5 984

95% CI: 95% confidence interval

Table 3.9.3.1.3: Self-reported prevalence of impaired vision and hearing in female participants aged 15 years and older, percentage distribution by age, locality, province and race, South Africa 2012

Background characteristics	Glasses/contact lenses to see far			Glasses/contact lenses to see near			Wear hearing aid		
	Yes			Yes			yes		
	%	95% CI	Total	%	95% CI	Total	%	95% CI	Total
Age									
15–24	5.2	[4.1–6.6]	2 300	7.8	[6.4–9.5]	2 291	9.0	[7.4–10.9]	2 202
25–34	6.0	[4.3–8.4]	1 725	8.4	[6.7–10.5]	1 709	8.9	[7.0–11.2]	1 670
35–44	9.6	[7.6–11.9]	1 525	12.1	[9.8–14.7]	1 514	9.4	[7.4–11.9]	1 462
45–54	21.0	[16.9–25.6]	1 370	24.7	[20.6–29.3]	1 359	8.4	[6.5–10.9]	1 312
55–64	30.9	[25.2–37.3]	1 014	32.6	[27.5–38.2]	1 006	11.2	[6.3–19.2]	971
65+	32.1	[25.3–39.8]	918	31.1	[24.6–38.5]	914	10.6	[5.8–18.5]	889
Total	13.1	[11.5–14.8]	8 852	15.3	[13.8–17.1]	8 793	9.3	[8.1–10.6]	8 506
Locality									
Urban formal	17.7	[15.0–20.8]	4 744	18.9	[16.3–21.9]	4 708	9.4	[7.6–11.6]	4 545
Urban informal	6.5	[4.8–8.6]	1 143	9.8	[7.1–13.3]	1 129	10.1	[7.8–13.1]	1 093
Rural formal	8.3	[5.3–12.7]	1 003	12.0	[8.8–16.1]	1 003	6.7	[4.7–9.5]	980
Rural informal	6.8	[5.4–8.6]	1 967	10.7	[8.9–12.8]	1 958	9.6	[7.9–11.5]	1 892
Total	13.1	[11.5–14.8]	8 857	15.3	[13.8–17.1]	8 798	9.3	[8.1–10.6]	8 510
Province									
Western Cape	24.8	[20.3–30.0]	1 230	26.5	[21.7–31.9]	1 226	7.4	[5.5–9.9]	1 207
Eastern Cape	13.8	[10.3–18.3]	931	18.0	[14.7–22.0]	933	11.1	[8.6–14.3]	886
Northern Cape	23.6	[17.8–30.6]	586	21.8	[15.6–29.7]	584	5.1	[3.1–8.3]	564
Free State	15.8	[10.5–23.0]	475	19.9	[14.2–27.2]	476	15.2	[10.1–22.4]	458
KwaZulu-Natal	18.9	[13.5–25.8]	1 443	21.2	[16.1–27.5]	1 426	13.6	[9.2–19.6]	1 362
North West	8.4	[5.9–11.6]	1 162	10.4	[7.4–14.3]	1 155	7.5	[5.1–10.8]	1 131
Gauteng	8.8	[6.2–12.2]	1 484	9.6	[7.1–12.9]	1 464	6.9	[5.2–9.2]	1 422
Mpumalanga	9.8	[6.1–15.4]	790	11.0	[7.3–16.1]	777	7.9	[5.0–12.1]	747
Limpopo	6.4	[4.2–9.6]	756	11.9	[9.0–15.7]	757	10.5	[7.8–13.9]	733
Total	13.1	[11.5–14.8]	8 857	15.3	[13.8–17.1]	8 798	9.3	[8.1–10.6]	8 510
Race									
African	9.0	[7.8–10.4]	5 975	11.8	[10.4–13.4]	5 930	9.1	[8.0–10.3]	5 711
White	31.5	[22.6–42.1]	382	30.8	[23.3–39.6]	380	13.1	[7.2–22.6]	371
Coloured	19.0	[16.1–22.3]	1 772	21.8	[18.7–25.3]	1 771	6.2	[4.8–7.8]	1 735
Asian/Indian	39.0	[32.3–46.1]	707	36.1	[30.0–42.7]	696	12.7	[7.8–20.0]	674
Total	13.1	[11.5–14.8]	8 836	15.3	[13.8–17.1]	8 777	9.3	[8.1–10.6]	8 491

95% CI: 95% confidence interval

3.9.4 Psychological distress, experience of traumatic events and post-traumatic-stress disorder (PTSD)

In this survey, psychological distress was measured using the Kessler-10 (Kessler, Aguilar-Gaxiola, Alonso et al. 2009). This is a 10-item questionnaire intended to yield a global measure of distress based on questions about anxiety and depressive symptoms that a person has experienced in the most recent four-week period.

Post-traumatic disorder is defined as an anxiety disorder that may develop after exposure to a life-threatening event or ordeal where severe physical harm occurred or was threatened (*Diagnostic and Statistical Manual of Mental Disorders* 5th Edition (DSM-5) 2013; *Psychology Today* 2013). According to the DSM-5 diagnostic criteria for post-traumatic stress disorder (PTSD) include a history of exposure to a traumatic event that meets specific stipulations and symptoms from each of four symptom clusters: intrusion, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity. The sixth criterion concerns duration of symptoms; the seventh assesses functioning; and the eighth criterion clarifies symptoms as not attributable to a substance or co-occurring medical condition.The diagnosis of PTSD is dependent on the intensity of the traumatic experience and frequency of the exposure.

In societies, such as South Africa, where there is a history of exposure to violence and a continued propensity towards violence at a familial and community level, many individuals are vulnerable to developing post-traumatic stress and PTSD (Ahmed 2007; Carey, Stein, Zungu-Dirwayi et al. 2003; Zungu-Dirwayi, Kaminer, Mbanga et al. 2004). PTSD may be triggered by life-threatening events such as violent personal assaults, natural or unnatural disasters and accidents. Although not all individuals exposed to life-threatening events will necessarily develop PTSD (Ahmed 2007; Sher 2004), some may develop other trauma induced common mental health disorders (CMD) such as anxiety and depression (Carey, Stein, Zungu-Dirwayi et al. 2003; Zungu-Dirwayi, Kaminer, Mbanga et al. 2004). These conditions are classified in the *International Statistical Classification of Diseases and Related Health Problems*, 10th Revision (ICD-10), as 'neurotic, stress-related and somatoform disorders' and 'mood disorders' (WHO 2007). Common mental disorders accounts for a high burden of disease and disability in low- and middle-income countries (LMICs) (Lopez, Mathers, Ezzaki et al. 2006; WHO 2001). They are also responsible for up to 10% of the global disease burden (Kessler, Aguilar-Gaxiola, Alonso et al. 2009 et al. 2009).

The result of this current survey provides the prevalence of psychological distress, exposure to lifetime traumatic events and screening positive for PTSD. Prevalence data is important to assess burden of disease and make policy recommendations for treatment programmes within the public health sector.

3.9.4.1 Psychological distress (Kessler-10, K-10)

As presented in Table 3.9.4.1.1, the mean K10 score of the total sample was 14 (range 10–50 or 0–40?) and it was higher for females (14.4) compared to males (13.5). About 31.4% of females compared to 25% males reported experiencing distress. Differences between males and females were statistically significant at the 5%-level. In the total sample, mean K10 scores increased as age increased and participants aged 65 years and older had the highest mean K10 score (16), significantly higher than younger age groups. Overall, about 42.6% of participants in the age group 65 years and older were distressed; this was significantly higher than all other age groups except for the 55–64 age category. Those living in rural informal areas were slightly more likely to have a higher mean

K10 score (14.4) and were also more distressed (32.5%) compared to those living in other areas; however, these were only significantly higher than the results for rural formal (farm) areas.

An analysis by province showed that the mean K10 score was significantly higher among people who live in Free State (16.7) compared to all other provinces. Correspondingly, about 48.5% of people in Free State reported being distressed, significantly higher compared all other South African provinces. Black Africans had a higher mean K10 score (14.3) compared to other race groups and the highest rate of distress was also found among black Africans at 31.2%; this was significantly higher than among coloureds and whites. Among men, black Africans had the highest mean K10 score (13.8) and highest rate of distress (28%); this was significantly higher than among coloured and white males (Table 3.9.4.1.2). Similarly, among women, black Africans had the highest mean K10 score (14.7) and highest rate of distress (34.2%), significantly higher when compared to coloured and white females (3.9.4.1.3).

Table 3.9.4.1.1: Mean Kessler score and percentage distressed versus not distressed among all participants aged 15 years and older in the 30 days preceding the interview by sex, age, locality, province and race, South Africa 2012

Kessler Psychological distress scale score								
Background characteristics			Total	Not distressed		Distressed		Total
	Mean	95% CI	n	%	95% CI	%	95% CI	n
Sex								
Male	13.5	[13.2–13.8]	6 242	75.0	[72.3–77.4]	25.0	[22.6–27.7]	6 242
Female	14.4	[14.1–14.7]	8 819	68.6	[66.1–71.0]	31.4	[29.0–33.9]	8 819
Total	14.0	[13.7–14.2]	15 061	71.6	[69.3–73.8]	28.4	[26.2–30.7]	15 061
Age								
15–24	13.2	[12.9–13.5]	4 257	77.2	[74.4–79.8]	22.8	[20.2–25.6]	4 257
25–34	13.7	[13.3–14.1]	2 950	72.2	[68.7–75.5]	27.8	[24.5–31.3]	2 950
35–44	13.9	[13.5–14.3]	2 484	73.8	[70.3–77.0]	26.2	[23.0–29.7]	2 484
45–54	14.4	[14.0–14.9]	2 254	68.1	[64.4–71.7]	31.9	[28.3–35.6]	2 254
55–64	14.7	[14.2–15.3]	1 723	64.3	[59.8–68.6]	35.7	[31.4–40.2]	1 723
65+	16.0	[15.3–16.7]	1 389	57.4	[52.4–62.3]	42.6	[37.7–47.6]	1 389
Total	14.0	[13.7–14.2]	15 057	71.6	[69.3–73.8]	28.4	[26.2–30.7]	15 057
Locality								
Urban formal	13.8	[13.4–14.3]	8 160	72.8	[69.2–76.2]	27.2	[23.8–30.8]	8 160
Urban informal	14.2	[13.6–14.9]	1 877	68.2	[62.6–73.4]	31.8	[26.6–37.4]	1 877
Rural formal	13.1	[12.4–13.8]	1 842	79.6	[73.6–84.5]	20.4	[15.5–26.4]	1 842
Rural informal	14.4	[14.0–14.8]	3 188	67.5	[64.3–70.5]	32.5	[29.5–35.7]	3 188
Total	14.0	[13.7–14.2]	15 067	71.6	[69.3–73.8]	28.4	[26.2–30.7]	15 067
Province								
Western Cape	12.1	[11.7–12.6]	2 129	85.9	[81.8–89.2]	14.1	[10.8–18.2]	2 129
Eastern Cape	14.4	[13.8–15.1]	1 621	65.6	[59.1–71.5]	34.4	[28.5–40.9]	1 621
Northern Cape	13.6	[12.5–14.7]	985	74.5	[64.5–82.5]	25.5	[17.5–35.5]	985
Free State	16.7	[15.9–17.5]	821	51.5	[47.3–55.6]	48.5	[44.4–52.7]	821
KwaZulu-Natal	15.3	[14.6–15.9]	2 482	60.9	[55.8–65.7]	39.1	[34.3–44.2]	2 482
North West	13.6	[13.1–14.2]	1 896	73.3	[68.6–77.5]	26.7	[22.5–31.4]	1 896

Gauteng	13.3	[12.7–13.8]	2 589	77.3	[72.2–81.7]	22.7	[18.3–27.8]	2 589
Mpumalanga	14.6	[13.7–15.6]	1 315	65.6	[57.9–72.5]	34.4	[27.5–42.1]	1 315
Limpopo	14.2	[13.6–14.8]	1 229	72.4	[67.4–76.8]	27.6	[23.2–32.6]	1 229
Total	14.0	[13.7–14.2]	15 067	71.6	[69.3–73.8]	28.4	[26.2–30.7]	15 067
Race								
African	14.3	[13.9–14.6]	10 009	68.8	[65.9–71.5]	31.2	[28.5–34.1]	10 009
White	12.7	[12.1–13.3]	708	82.3	[75.8–87.3]	17.7	[12.7–24.2]	708
Coloured	12.6	[12.2–13.1]	3 025	82.2	[78.7–85.2]	17.8	[14.8–21.3]	3 025
Asian/Indian	14.1	[12.6–15.7]	1 273	75.6	[67.8–81.9]	24.4	[18.1–32.2]	1 273
Total	14.0	[13.7–14.2]	15 015	71.6	[69.3–73.8]	28.4	[26.2–30.7]	15 015

95% CI: 95% confidence interval

Table 3.9.4.1.2: Mean Kessler score and percentage distressed versus not distressed among male participants aged 15 years and older in the 30 days preceding the interview by age, province and race, South Africa 2012

Kessler Psychological distress scale score								
Background characteristics			Total	Not distressed		Distressed		Total
	Mean	95% CI	n	%	95% CI	%	95% CI	n
Age								
15–24	12.8	[12.4–13.1]	1 963	80.3	[77.2–83.0]	19.7	[17.0–22.8]	1 963
25–34	13.5	[13.0–13.9]	1 237	73.4	[68.7–77.6]	26.6	[22.4–31.3]	1 237
35–44	13.7	[13.1–14.3]	963	76.1	[71.2–80.4]	23.9	[19.6–28.8]	963
45–54	13.9	[13.3–14.5]	887	72.2	[67.2–76.8]	27.8	[23.2–32.8]	887
55–64	14.0	[13.2–14.7]	712	71.2	[64.7–76.9]	28.8	[23.1–35.3]	712
65+	15.1	[14.2–15.9]	475	62.2	[55.2–68.8]	37.8	[31.2–44.8]	475
Total	13.5	[13.2–13.8]	6 237	75.0	[72.3–77.4]	25.0	[22.6–27.7]	6 237
Province								
Western Cape	11.9	[11.4–12.3]	898	87.7	[83.5–91.0]	12.3	[9.0–16.5]	898
Eastern Cape	14.2	[13.4–15.0]	682	67.0	[59.9–73.4]	33.0	[26.6–40.1]	682
Northern Cape	13.3	[12.3–14.4]	406	76.2	[66.1–84.1]	23.8	[15.9–33.9]	406
Free State	15.8	[14.8–16.7]	344	58.9	[51.4–66.0]	41.1	[34.0–48.6]	344
KwaZulu-Natal	14.5	[13.8–15.2]	1 053	67.2	[61.2–72.7]	32.8	[27.3–38.8]	1 053
North West	13.4	[12.7–14.2]	742	76.1	[70.3–81.1]	23.9	[18.9–29.7]	742
Gauteng	12.9	[12.3–13.5]	1 109	79.8	[73.9–84.5]	20.2	[15.5–26.1]	1 109
Mpumalanga	14.2	[13.0–15.4]	526	68.7	[59.6–76.5]	31.3	[23.5–40.4]	526
Limpopo	13.4	[12.5–14.2]	482	76.0	[68.8–82.0]	24.0	[18.0–31.2]	482
Total	13.5	[13.2–13.8]	6 242	75.0	[72.3–77.4]	25.0	[22.6–27.7]	6 242
Race								
African	13.8	[13.5–14.2]	4 064	72.0	[68.8–75.0]	28.0	[25.0–31.2]	4 064
White	12.2	[11.5–12.8]	324	86.5	[79.4–91.5]	13.5	[8.5–20.6]	324
Coloured	12.1	[11.7–12.5]	1 248	85.8	[82.0–88.9]	14.2	[11.1–18.0]	1 248
Asian/Indian	13.7	[11.9–15.5]	577	77.9	[69.2–84.7]	22.1	[15.3–30.8]	577
Total	13.5	[13.2–13.8]	6 213	75.0	[72.3–77.4]	25.0	[22.6–27.7]	6 213

95% CI: 95% confidence interval

Table 3.9.4.1.3: Mean Kessler score and percentage distressed versus not distressed among female participants aged 15 years and older in the 30 days preceding the interview by age, province and race, South Africa 2012

Kessler Psychological distress scale score								
Background characteristics			Total	Not distressed		Distressed		Total
	Mean	95% CI	n	%	95% CI	%	95% CI	n
Age								
15–24	13.6	[13.2–14.0]	2 292	74.2	[70.7–77.5]	25.8	[22.5–29.3]	2 292
25–34	13.9	[13.5–14.4]	1 713	71.1	[67.1–74.8]	28.9	[25.2–32.9]	1 713
35–44	14.1	[13.7–14.5]	1 520	71.7	[68.1–75.0]	28.3	[25.0–31.9]	1 520
45–54	14.9	[14.4–15.5]	1 365	64.6	[60.5–68.5]	35.4	[31.5–39.5]	1 365
55–64	15.3	[14.7–16.0]	1 010	58.6	[52.7–64.4]	41.4	[35.6–47.3]	1 010
65+	16.6	[15.7–17.4]	914	54.7	[48.6–60.7]	45.3	[39.3–51.4]	914
Total	14.4	[14.1–14.7]	8 814	68.6	[66.1–71.0]	31.4	[29.0–33.9]	8 814
Province								
Western Cape	12.3	[11.8–12.9]	1 231	84.3	[79.4–88.2]	15.7	[11.8–20.6]	1 231
Eastern Cape	14.7	[14.0–15.4]	935	64.2	[56.9–71.0]	35.8	[29.0–43.1]	935
Northern Cape	14.0	[12.7–15.2]	579	72.9	[62.2–81.5]	27.1	[18.5–37.8]	579
Free State	17.6	[16.8–18.3]	477	44.3	[40.4–48.4]	55.7	[51.6–59.6]	477
KwaZulu-Natal	15.9	[15.1–16.7]	1 429	55.7	[49.5–61.7]	44.3	[38.3–50.5]	1 429
North West	13.8	[13.2–14.3]	1 154	70.9	[65.7–75.5]	29.1	[24.5–34.3]	1 154
Gauteng	13.6	[13.0–14.2]	1 479	74.9	[69.6–79.6]	25.1	[20.4–30.4]	1 479
Mpumalanga	15.0	[14.0–16.0]	788	63.0	[55.1–70.1]	37.0	[29.9–44.9]	788
Limpopo	14.8	[14.1–15.6]	747	69.6	[64.2–74.5]	30.4	[25.5–35.8]	747
Total	14.4	[14.1–14.7]	8 819	68.6	[66.1–71.0]	31.4	[29.0–33.9]	8 819
Race								
African	14.7	[14.3–15.0]	5 942	65.8	[62.8–68.7]	34.2	[31.3–37.2]	5 942
White	13.1	[12.4–13.9]	384	78.5	[70.1–85.0]	21.5	[15.0–29.9]	384
Coloured	13.1	[12.6–13.6]	1 776	79.1	[75.0–82.7]	20.9	[17.3–25.0]	1 776
Asian/Indian	14.6	[13.0–16.2]	696	73.3	[64.0–80.9]	26.7	[19.1–36.0]	696
Total	14.4	[14.1–14.7]	8 798	68.6	[66.1–71.0]	31.4	[29.0–33.9]	8 798

95% CI: 95% confidence interval

3.9.4.2 Intensity of psychological distress

With regards to the intensity of psychological distress experienced in the 30 days preceding the interview, overall the majority of participants (83.3%) had low intensity, while 10.3% had moderate (Table 3.9.4.2.1). A smaller proportion of the sample had high intensity (4.2%) and 2.2% had very high intensity of psychological distress. An analysis by sex showed that males had a significantly higher level of low distress compared to females. Older participants of 65 years and above had the highest level of very high distress compared to all other age groups except those aged 55–64. Very high psychological distress did not differ with regards to locality.

When the data was disaggregated by sex, there were a few significant findings. Among men, low distress was 85.7%, moderate distress 9%, high distress 3.4%, and very high distress was 1.9%. In addition, for men, very high psychological distress did not differ regarding age, locality, province and race. Among females, low distress was 81.1%, moderate distress 11.5%, high distress 4.9%, and very high distress 2.5%. Women 65 years and older reported significantly higher levels of psychological distress compared to younger women except those aged 55–64. Levels of very high psychological distress reported for males only and females only did not differ by locality, province and race.

Some significant differences (at a 5%-level) were observed with respect to age. For the overall sample younger age groups (87.6% of 15–24 years) had lower levels of psychological distress compared to the older age groups. Nevertheless the majority of the sample had low distress in general. Major provincial differences were observed: participants from the Western Cape (92.7%) reported the highest level of low distress as compared to other provinces. However, even in the other eight provinces the majority of participants seem to have very low levels of distress (Eastern Cape 80.4%, Free State 71.4%, KwaZulu-Natal 78%, North West 85%, Mpumalanga 76.4%, and Limpopo 80.2%). An analysis by race showed that 81.2% black Africans reported lower levels of low distress as compared whites (92.0%) and coloureds (90.2%). When the data is disaggregated by sex, the trend is similar for the total sample.

In general levels of moderate distress were low in the sample. The intensity of distress per age category is depicted in Figure 3.9.4.2.1. Only 8.2% of the younger age group (15–24 years) reported lower levels of moderate distress compared to the 55–64 years (12.1%); these differences were significant at 5%. Interestingly, the older the person, the more distress they reported. Among the age group 65 and older, 15.9% reported moderate distress while only 10.5% of the respondents aged 25–34 years reported moderate distress. The findings were also significant at 5%. An analysis by province found that participants from Western Cape (4.4%) reported the lowest levels of moderate distress followed by Northern Cape (7.9%) and Gauteng (8.0%). A comparison of the other provinces showed that Free State (15.0%) and Mpumalanga (15.5%) had similar rates and so too Eastern Cape (13.9%) and KwaZulu-Natal (13.7%). The same was observed for North West (10.2%) and Limpopo (10.8%). With regards to race, significantly more black Africans reported experiencing moderate levels of distress (11.7%) compared to Indians (6.9%), coloureds (5.8%) and whites (5.0%).

When the data is disaggregated by sex similar trends observed with low distress emerged. Younger participants (15–24 years) also reported lower levels of moderate distress (6.8%) compared to older participants. Among males older than 65 years, 14.2% reported experiencing moderate distress. Similarly, and provincial differences were observed and again, Western Cape reported lower levels of moderate psychological distress compared to other provinces.

In general, small percentages of the sample reported high levels of distress. Similar trends as those observed for moderate distress were also noted with regards to high distress. As was observed in other categories, younger participants (15–24 years, 3.2%) had lowest levels of high distress when compared to older participants (6.3%). These findings were significant at the 5% level. Further, the Western Cape reported the lowest levels of high distress (1.7%) when compared to the rest of the provinces. Black Africans reported higher levels of high distress (4.7%) when compared to other race groups, and significantly higher than white and coloured respondents. When the data were analysed by sex and province, it was observed that females in Free State (8.5%) had higher levels of high distress compared to females in North West (3.2%).

Figure 3.9.4.2.1: Percentage of all participants aged 15 years and older experiencing moderate and very high distress by age, South Africa 2012

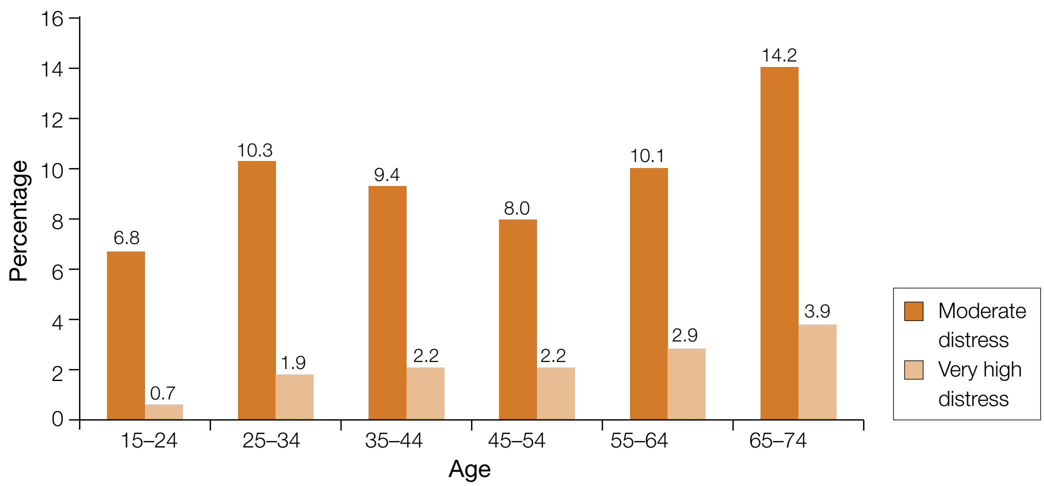


Table 3.9.4.2.1: Psychological distress in the 30 days preceding the interview measured by the Kessle psychological distress scale (K10) among participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	Kessler psychological distress scale score								
	Low distress		Moderate distress		High distress		Very high distress		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex									
Males	85.7	[83.7–87.4]	9.0	[7.8–10.5]	3.4	[2.7–4.4]	1.9	[1.4–2.4]	6 242
Females	81.1	[79.3–82.8]	11.5	[10.3–12.8]	4.9	[4.1–5.8]	2.5	[2.0–3.0]	8 819
Total	83.3	[81.6–84.8]	10.3	[9.2–11.5]	4.2	[3.5–5.0]	2.2	[1.8–2.6]	15 061
Age									
15–24	87.6	[85.5–89.3]	8.2	[6.8–9.7]	3.2	[2.5–4.1]	1.1	[0.7–1.6]	4 257
25–34	84.2	[81.6–86.5]	10.5	[8.7–12.6]	3.6	[2.5–5.0]	1.7	[1.1–2.6]	2 950
35–44	83.2	[80.4–85.7]	9.7	[7.9–11.9]	4.8	[3.5–6.5]	2.3	[1.6–3.3]	2 484
45–54	81.2	[78.2–83.9]	11.3	[9.4–13.6]	5.0	[3.6–7.0]	2.5	[1.7–3.8]	2 254
55–64	79.5	[75.8–82.9]	12.1	[9.8–14.8]	4.9	[3.6–6.6]	3.5	[2.4–5.3]	1 723
65 and above	72.4	[68.1–76.3]	15.9	[13.4–18.8]	6.3	[4.4–8.8]	5.4	[4.1–7.1]	1 389
Total	83.3	[81.6–84.8]	10.3	[9.2–11.5]	4.2	[3.5–5.0]	2.2	[1.8–2.6]	15 057
Locality									
Urban formal	84.2	[81.6–86.5]	9.6	[8.0–11.5]	4.0	[3.1–5.1]	2.2	[1.7–2.9]	8 160
Urban informal	81.9	[77.9–85.4]	11.8	[9.1–15.2]	3.9	[2.8–5.3]	2.4	[1.4–4.1]	1 877
Rural formal	86.6	[81.3–90.5]	7.2	[4.6–11.1]	4.2	[2.0–8.6]	2.0	[1.2–3.5]	1 842
Rural informal	80.6	[78.1–83.0]	12.4	[10.7–14.3]	4.9	[3.9–6.1]	2.1	[1.6–2.8]	3 188
Total	83.3	[81.6–84.8]	10.3	[9.2–11.5]	4.2	[3.5–5.0]	2.2	[1.8–2.6]	15 067
Province									
Western Cape	92.7	[89.6–94.9]	4.4	[2.9–6.8]	1.7	[1.1–2.8]	1.2	[0.8–1.7]	2 129
Eastern Cape	80.4	[75.0–84.8]	13.9	[10.0–19.0]	4.0	[2.4–6.6]	1.7	[1.0–2.7]	1 621
Northern Cape	85.8	[79.3–90.5]	7.9	[5.2–11.8]	3.9	[2.2–6.8]	2.4	[1.4–4.2]	985
Free State	71.4	[65.7–76.5]	15.0	[12.7–17.6]	6.8	[5.0–9.1]	6.9	[4.4–10.6]	821
KwaZulu–Natal	78.0	[73.3–82.1]	13.7	[10.9–17.0]	5.4	[4.0–7.2]	2.9	[2.0–4.3]	2 482
North West	85.0	[81.2–88.2]	10.2	[7.9–13.0]	3.1	[1.9–5.0]	1.7	[1.1–2.6]	1 896

Gauteng	86.9	[83.5–89.7]	8.0	[6.0–10.4]	3.7	[2.4–5.7]	1.4	[0.9–2.4]	2 589
Mpumalanga	76.4	[69.9–81.9]	15.5	[11.5–20.6]	5.3	[3.7–7.3]	2.8	[1.4–5.5]	1 315
Limpopo	80.2	[75.9–84.0]	10.8	[8.2–14.1]	6.1	[4.3–8.6]	2.8	[1.8–4.4]	1 229
Total	83.3	[81.6–84.8]	10.3	[9.2–11.5]	4.2	[3.5–5.0]	2.2	[1.8–2.6]	15 067
Race									
African	81.2	[79.2–83.2]	11.7	[10.4–13.2]	4.7	[3.9–5.6]	2.3	[1.9–2.9]	10 009
White	92.0	[88.4–94.6]	5.0	[3.0–8.1]	1.8	[0.9–3.5]	1.2	[0.6–2.5]	708
Coloured	90.2	[87.6–92.2]	5.8	[4.4–7.7]	2.2	[1.5–3.2]	1.8	[1.2–2.7]	3 025
Asian/Indian	83.9	[75.9–89.6]	6.9	[5.0–9.3]	6.1	[2.9–12.5]	3.2	[1.3–7.3]	1 273
Total	83.3	[81.6–84.8]	10.3	[9.2–11.5]	4.2	[3.5–5.0]	2.2	[1.8–2.6]	15 015

95% CI: 95% confidence interval

3.9.4.3 Experience of traumatic events

The study found that family-related traumatic events (14.5%) followed by personal assaults (6.9%) were the most common lifetime traumatic events experienced by the participants (Table 3.9.4.3.1). A tenth (10.5%) reported experiencing other lifetime traumatic events and 2.6% had at some stage experienced war and terrorism. There was a significant difference between respondents aged 55–64 years (12.3%) and those aged 15–24 years (7.3%) in reporting lifetime experiences of other traumatic events, with the older age group reporting higher levels of having experienced traumatic events in this category.

It was found that 1.6% of the 15–24 year group had experienced war and terrorism compared to 5% of the 55–64 year group. These differences were significant at the 5%-level. Significant differences (at the 5%-level) were also observed by province. Free State (4.1%) and KwaZulu-Natal (4.6%) had the highest reported rates followed by Eastern Cape (3.9%) and Northern Cape (3.4%). Western Cape (2.2%) and Gauteng (1.8%) had the similar rates while North West (0.6%) reported the lowest rates of experiences of war and terrorism. Surprisingly, whites (5.7%) reported more experiences of war and terrorism compared to black Africans (2.4%) and coloureds (1.4%).

With regards to locality, it was found that residents from urban informal (8.3%) and urban formal (7.4%) areas had the highest reported rates of experiences of personal assault compared to respondents from rural formal areas (3.6%); these differences were significant at 5%-level. When the data were analysed by province, significant differences at the 5%-level were also observed. It was found that Free State (12.7%), Eastern Cape (11%) and KwaZulu-Natal (10%) had the highest reported rates of personal assault followed by Western Cape (8.1%), Limpopo (5.3%), Northern Cape (4.7%), Gauteng (4.9%), and Mpumalanga (3.7%). While North West (2.5%) had the lowest reported rates of personal assault.

An analysis of traumatic experiences showed significant difference (at 5% level) with regards to experiences of family-related traumatic events in a lifetime by age, place of residence and province. When data were analysed by age it was found that participants aged 15–24 years (12.3%) had the lowest rates of reported family-related traumatic events compared to participants aged 55–64 years old (18.3%). A higher proportion of participants from urban formal areas (15.3%) reported experiencing family-related traumatic events compared to participants from rural formal areas (8.2%). As was observed with the rates of personal assault, the provinces with the highest rates of family-related traumatic events were Free State (27.8%), Eastern Cape (22.9%), and KwaZulu-Natal (20.2%) followed by Limpopo (15.6%), Northern Cape (14.9%) and Mpumalanga (14.5%). Western Cape (11.2%) and Gauteng (10.5%) had similar rates while North West (3.8%) had the lowest reported rates of all the provinces. The overall rates of personal assault

Table 3.9.4.3.1: Percentage of all participants aged 15 years and older reporting lifetime experiences of traumatic events by sex, age, locality, province and race, South Africa 2012

Background characteristics	War and terorism			Personal assault			Family related			Other		
	Yes		Total	Yes		Total	Yes		Total	Yes		Total
	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI	n
Sex												
Male	3.9	[3.0–5.1]	6 292	7.8	[6.6–9.2]	6 294	13.8	[12.0–15.9]	6 282	11.9	[10.2–13.8]	6 290
Female	1.5	[1.1–2.0]	8 908	6.1	[5.0–7.4]	8 906	15.1	[13.2–17.4]	8 887	9.2	[7.8–10.9]	8 900
Total	2.6	[2.1–3.3]	15 200	6.9	[5.9–8.0]	15 200	14.5	[12.7–16.5]	15 169	10.5	[9.0–12.1]	15 190
Age												
15–24	1.6	[1.1–2.3]	4 296	5.5	[4.4–7.0]	4 297	12.3	[10.2–14.8]	4 288	7.3	[5.9–9.1]	4 295
25–34	2.4	[1.7–3.4]	2 987	7.1	[5.6–9.0]	2 989	13.8	[11.3–16.7]	2 981	10.8	[8.7–13.2]	2 985
35–44	3.2	[2.2–4.7]	2 498	7.4	[5.7–9.7]	2 496	14.5	[12.2–17.3]	2 492	11.3	[9.2–13.9]	2 496
45–54	3.4	[2.2–5.3]	2 275	8.5	[6.7–10.7]	2 275	17.2	[14.5–20.3]	2 273	12.6	[10.4–15.1]	2 275
55–64	5.0	[2.5–9.7]	1 743	7.2	[5.5–9.4]	1 742	18.3	[15.1–22.0]	1 736	12.3	[9.8–15.3]	1 739
65+	1.6	[0.9–2.6]	1 397	6.3	[3.6–10.8]	1 397	16.0	[13.0–19.5]	1 395	13.4	[9.6–18.3]	1 396
Total	2.6	[2.1–3.3]	15 196	6.9	[5.9–8.0]	15 196	14.5	[12.7–16.5]	15 165	10.5	[9.0–12.1]	15 186
Locality												
Urban formal	2.7	[2.0–3.8]	8 231	7.4	[5.8–9.3]	8 230	15.3	[12.5–18.5]	8 204	10.7	[8.6–13.3]	8 223
Urban informal	2.5	[1.6–3.8]	1 898	8.3	[6.2–10.8]	1 897	14.8	[11.0–19.7]	1 896	13.0	[9.4–17.8]	1 897
Rural formal	3.4	[2.2–5.4]	1 858	3.6	[2.5–5.3]	1 858	8.2	[5.3–12.4]	1 856	5.4	[3.5–8.2]	1 857
Rural informal	2.2	[1.5–3.3]	3 219	6.2	[4.9–7.8]	3 221	14.7	[12.0–18.0]	3 219	10.6	[8.5–13.1]	3 219
Total	2.6	[2.1–3.3]	15 206	6.9	[5.9–8.0]	15 206	14.5	[12.7–16.5]	15 175	10.5	[9.0–12.1]	15 196
Province												
Western Cape	2.2	[1.5–3.3]	2 146	8.1	[5.7–11.5]	2 145	11.2	[8.4–14.8]	2 138	7.6	[5.6–10.2]	2 141
Eastern Cape	3.9	[2.8–5.4]	1 630	11	[8.8–13.6]	1 630	22.9	[17.9–28.8]	1 628	17.6	[13.7–22.3]	1 629
Northern Cape	3.4	[1.7–6.7]	996	4.7	[3.0–7.1]	996	14.9	[9.8–21.9]	994	4.8	[2.9–8.1]	995
Free State	4.1	[2.7–6.1]	820	12.7	[8.1–19.4]	820	27.8	[17.8–40.6]	820	19.3	[12.6–28.4]	820
KwaZulu-Natal	4.6	[2.6–7.9]	2 518	10	[6.9–14.2]	2 518	20.2	[14.1–28.2]	2 516	15.8	[10.8–22.4]	2 518
North West	0.6	[0.3–1.5]	1 900	2.5	[1.6–3.6]	1 902	3.8	[2.5–5.9]	1 899	4.2	[2.9–6.1]	1 900
Gauteng	1.8	[1.1–2.9]	2 611	4.9	[3.3–7.4]	2 610	10.5	[8.0–13.8]	2 598	7.5	[5.3–10.5]	2 608
Mpumalanga	2.3	[1.1–4.9]	1 336	3.7	[2.2–6.4]	1 336	14.5	[9.2–22.0]	1 334	7.8	[5.1–11.8]	1 336
Limpopo	2.6	[1.3–5.1]	1 249	5.3	[3.3–8.4]	1 249	15.6	[11.5–21.0]	1 248	10.7	[7.7–14.6]	1 249
Total	2.6	[2.1–3.3]	15 206	6.9	[5.9–8.0]	15 206	14.5	[12.7–16.5]	15 175	10.5	[9.0–12.1]	15 196
Race												
African	2.4	[1.9–3.0]	10 093	6.8	[5.7–8.2]	10 093	14.9	[12.7–17.3]	10 078	11.1	[9.3–13.1]	10 091
White	5.7	[3.2–9.9]	715	6.2	[3.7–10.2]	715	11.8	[8.2–16.7]	713	9.7	[6.3–14.7]	714
Coloured	1.4	[0.9–2.2]	3048	7.8	[5.3–11.3]	3 048	12.9	[9.9–16.7]	3038	7.1	[5.3–9.5]	3 043
Asian/Indian	2.0	[1.0–3.8]	1 298	7.3	[4.7–11.0]	1 298	21.0	[13.6–31.0]	1 294	7.2	[5.0–10.4]	1 296
Total	2.6	[2.1–3.3]	15 154	6.9	[5.9–8.0]	15 154	14.5	[12.7–16.5]	15 123	10.5	[9.0–12.1]	15 144

95% CI: 95% confidence interval

and family-related trauma is depicted in Figure 3.9.4.3.1, while Figure 3.9.4.3.2 depicts male experiences of personal assault and family-related trauma.

With regards to the other category of lifetime traumatic events, significant differences (at the 5%-level) were observed when data were analysed by age, locality and province. It was observed that participants aged 15–24 year had the lowest reported levels of other traumatic events when compared to other age groups. An analysis by locality showed that rural formal areas (5.4%) had the lowest rates compared to other localities. A comparison of provinces showed that Free State (19.3%) had the highest rate of other traumatic experiences. Eastern Cape (17.6%) and KwaZulu-Natal (15.8%) followed by Western Cape (7.6%), Gauteng (7.5%) and Mpumalanga (7.8%) had similar rates. As observed above with other forms of traumatic events, North West (4.2%) had the lowest rates of reported other traumatic experiences.

An analysis of a lifetime experience of trauma by sex showed that significantly more males (3.9%) reported experiences of war and terrorism compared to females (1.5%). Significant differences at the 5% level were also observed among males only and females only when the data were analysed by age, province and race. Younger males aged 15–24 (1.5%) reported the lowest levels of lifetime experiences of war and terrorism. Among females the age groups that had the lowest rates was those aged 45–54 (1.1%) when compared to other age groups. The provinces with the highest reported experience of lifetime experiences of war and terrorism were reported in KwaZulu-Natal (7.8%) while North West (0.5%) has the lowest rates in the country. By race more white males (10.5%) reported experiences of life experiences of war and terrorism than black African (3.2%) and Coloured (2.6%). These differences were significant at 5% level.

An analysis of lifetime experiences of personal assault among males showed significant differences by locality and province at 5%-level. It was found that more male participants from urban formal areas (7.6%) reported lifetime experiences of personal assault compared to those from rural formal areas (3.4%). The provinces with the highest levels of assaults were Free State (14.6%), Eastern Cape (13.0%) and KwaZulu-Natal (10.4%). The province with the lowest reported rates of assault was North West (3.2%). For females significant differences were observed at the 5%-level with regards to locality and province for experiences of personal assault. A high number of female participants from urban formal areas (7.2%) reported personal assault compared to female participants from rural formal areas (3.9%). As was observed among males, a higher proportion of females from Free State (11.0%) and KwaZulu-Natal (9.7%) reported experiencing personal assault while North West (1.8%) had the lowest number of females reporting experiences of assaults.

Under the category of lifetime family-related trauma, significant differences were observed at the 5%-level when data was analysed by province among male respondents. It was found that the two provinces that have been leading with reported experiences or trauma were also leading under this category (Free State (26.4%) and (Eastern Cape 21.1%)). North West (3.2%) remained the province with the lowest number of male respondents reporting experiences of family-related trauma. Among female respondents with regard to family-related trauma, significance differences were observed when the data were analysed by locality and province. Female participants from urban formal areas (16.3%) reported higher levels of family-related trauma when compared females from rural formal areas (8.5%). Similar to the other categories of trauma, Free State (29.1%) and Eastern Cape (24.5%) had a higher number of females reporting family-related trauma compared to other provinces. As was observed before, North West (4.3%) had the lowest numbers of females who had experienced family-related trauma.

Figure 3.9.4.3.1: Lifetime experience of traumatic events among all participants, by province, South Africa 2012

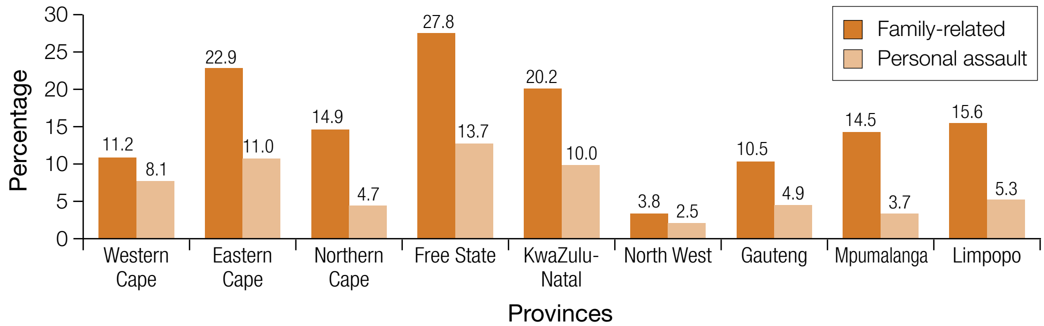
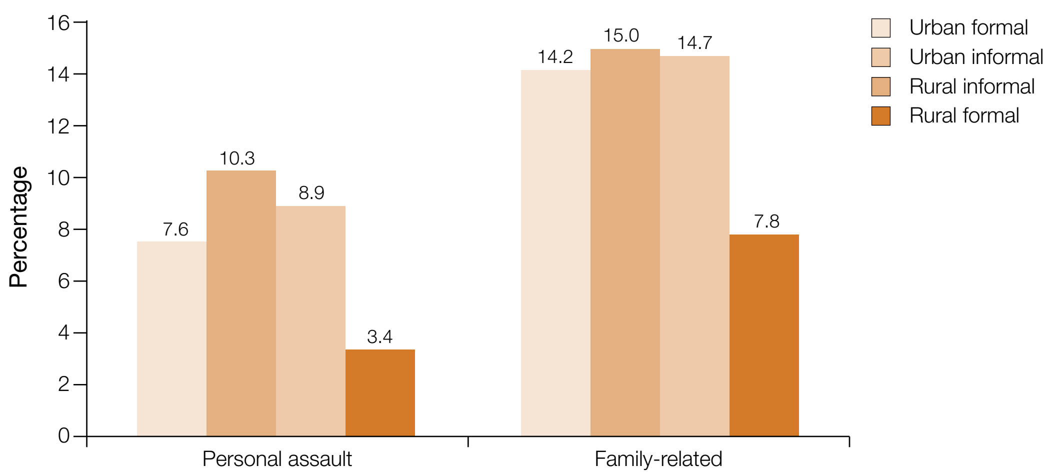


Figure 3.9.4.3.2: Lifetime experiences of traumatic events among male participants by locality, South Africa 2012



Finally, for the last category of lifetime traumatic experiences assessed significant differences were also observed among males when data were analysed by locality and province at 5%-level. The study found that males living in urban informal areas (14.8%) followed by those from rural informal (13.6%) had the highest reported rates of other traumatic experiences when compared to males in rural formal areas (5.9%). A provincial comparison showed that males from Free State (22.9%), Eastern Cape (20.0%), KwaZulu-Natal (16.3%) and Limpopo (15.4%) were more likely to have experienced other traumatic experiences compared to provinces such as Western Cape (9.6%), Gauteng (8.1%) and Northern Cape (5.2%). North West (4.7%), again, had the lowest reported experiences of other traumatic events among male participants. Among female participants, significant differences were observed when data were analysed by age and province. It was found that participants aged 15–24 (6.4%) had the lowest reported levels of other traumatic experiences. A provincial comparison showed that females from Free State (15.9%), KwaZulu-Natal (15.4%) and Eastern Cape (15.3%) had experienced higher levels of other traumatic events compared to provinces such as Limpopo (7.1%), Gauteng (7%), Western Cape (5.8%), Mpumalanga (6.9%), Northern Cape (4.5%), and North West (3.8%). The observed differences were significant at the 5%-level.

3.9.4.4 Symptoms associated with PTSD

The rates of symptoms of PTSD reported are based on the percentage of participants who reported being symptomatic for PTSD in the week preceding the interview (Table

3.9.4.4.1). It was found that 41.4% were symptomatic for PTSD and 58.6% had no symptoms. The majority of those who were symptomatic for PTSD were Asians/Indians (47.2%) and coloureds (47.1%), followed by black Africans (42.2). These differences were not significant at the 5%-level.

3.9.4.5 Prevalence of PTSD

The overall prevalence of lifetime post-traumatic stress disorder was 11.1%; this was highest among the coloured population group 13.7%, followed by black Africans (11.2%) and Asian/Indians (7.7%) (Table 3.9.4.5.1).

Table 3.9.4.4.1: Prevalence of symptoms related to post-traumatic stress disorder in the week preceding the interview among all participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

	Prevalence of symptoms of PTSD				
	Symptomatic		Not symptomatic		Total
Background characteristics	%	95% CI	%	95% CI	n
Sex					
Male	40.3	[35.3-45.5]	59.7	[54.5-64.7]	659
Female	42.3	[37.2-47.6]	57.7	[52.4-62.8]	984
Total	41.4	[37.5-45.3]	58.6	[54.7-62.5]	1 643
Age					
15 to 24	48.7	[41.5-56.1]	51.3	[43.9-58.5]	389
25 to 34	39.2	[30.9-48.2]	60.8	[51.8-69.1]	297
35 to 44	45.3	[37.6-53.3]	54.7	[46.7-62.4]	293
45 to 54	35.3	[28.1-43.3]	64.7	[56.7-71.9]	271
55 to 64	38.5	[28.0-50.1]	61.5	[49.9-72.0]	230
65 and above	32.4	[22.5-44.2]	67.6	[55.8-77.5]	163
Total	41.4	[37.5-45.3]	58.6	[54.7-62.5]	1 643
Locality					
Urban formal	41.8	[36.1-47.7]	58.2	[52.3-63.9]	870
Urban informal	41.8	[32.3-51.9]	58.2	[48.1-67.7]	251
Rural formal	38.6	[28.0-50.4]	61.4	[49.6-72.0]	100
Rural informal	40.7	[34.7-46.9]	59.3	[53.1-65.3]	423
Total	41.4	[37.5-45.3]	58.6	[54.7-62.5]	1 644
Province					
Western Cape	36.9	[28.6-46.2]	63.1	[53.8-71.4]	144
Eastern Cape	45.7	[36.9-54.8]	54.3	[45.2-63.1]	306
Northern Cape	*	*	*	*	82
Free State	56.5	[50.3-62.5]	43.5	[37.5-49.7]	186
KwaZulu-Natal	36.3	[28.3-45.3]	63.7	[54.7-71.7]	337
North West	*	*	*	*	73
Gauteng	41.7	[31.2-53.1]	58.3	[46.9-68.8]	222
Mpumalanga	39.5	[32.2-47.4]	60.5	[52.6-67.8]	125
Limpopo	36.3	[28.3-45.0]	63.7	[55.0-71.7]	169
Total	41.4	[37.5-45.3]	58.6	[54.7-62.5]	1 644
Race					
African	42.2	[38.2-46.3]	57.8	[53.7-61.8]	1 227
White	*	*	*	*	79

Coloured	47.1	[33.8-60.8]	52.9	[39.2-66.2]	229
Asian/Indian	47.2	[39.7-54.8]	52.8	[45.2-60.3]	106
Total	41.4	[37.5-45.3]	58.6	[54.7-62.5]	1 641

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.9.4.5.1: Prevalence of lifetime post-traumatic stress disorder in the week preceding the interview among all participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	Prevalence of diagnosis of PTSD: Positive on all the qualifying BCD questions				
	PTSD		No PTSD		Total
	%	95% CI	%	95% CI	n
Sex					
Male	8.2	[5.9-11.3]	91.8	[88.7-94.1]	636
Female	13.6	[10.0-18.1]	86.4	[81.9-90.0]	951
Total	11.1	[8.6-14.2]	88.9	[85.8-91.4]	1 587
Age					
15 to 24	11.4	[7.6-16.9]	88.6	[83.1-92.4]	380
25 to 34	10.0	[5.9-16.3]	90.0	[83.7-94.1]	291
35 to 44	12.0	[7.5-18.8]	88.0	[81.2-92.5]	285
45 to 54	14.1	[7.5-24.7]	85.9	[75.3-92.5]	258
55 to 64	11.0	[6.7-17.7]	89.0	[82.3-93.3]	216
65+	5.7	[3.1-10.5]	94.3	[89.5-96.9]	157
Total	11.1	[8.6-14.2]	88.9	[85.8-91.4]	1 587
Locality					
Urban formal	11.8	[8.2-16.8]	88.2	[83.2-91.8]	834
Urban informal	14.0	[8.2-23.0]	86.0	[77.0-91.8]	248
Rural formal	*	*	*	*	97
Rural informal	8.6	[5.7-12.9]	91.4	[87.1-94.3]	409
Total	11.1	[8.6-14.2]	88.9	[85.8-91.4]	1 588
Province					
Western Cape	4.9	[2.4-9.6]	95.1	[90.4-97.6]	140
Eastern Cape	7.0	[4.2-11.4]	93.0	[88.6-95.8]	293
Northern Cape	*	*	*	*	81
Free State	11.6	[6.8-19.1]	88.4	[80.9-93.2]	178
KwaZulu-Natal	14.9	[9.0-23.8]	85.1	[76.2-91.0]	328
North West	*	*	*	*	71
Gauteng	11.9	[7.3-18.9]	88.1	[81.1-92.7]	214
Mpumalanga	13.4	[6.3-26.2]	86.6	[73.8-93.7]	121
Limpopo	10.2	[5.4-18.5]	89.8	[81.5-94.6]	162
Total	11.1	[8.6-14.2]	88.9	[85.8-91.4]	1 588
Race					
African	11.2	[8.4-14.8]	88.8	[85.2-91.6]	1 190
White	*	*	*	*	72
Coloured	13.7	[6.3-27.1]	86.3	[72.9-93.7]	223
Asian/Indian	7.7	[1.7-28.5]	92.3	[71.5-98.3]	100
Total	11.1	[8.6-14.2]	88.9	[85.8-91.4]	1 585

95% CI: 95% confidence interval

** Too few observations to record reliably*

Discussion

The key findings of this section of the report are discussed below.

Health status and daily functioning (work and household)

It is not surprising that younger participants reported better perceived health status than older ones. It is well established that the aging process is often accompanied by deterioration in biological, physiological and mental functioning (Bixby Spalding, Haufler et al. 2007; Park, Gutchess, Meade et al. 2007; Moonen, Van Boxtel, De Groot et al. 2008). Even in countries such as Japan, where there is longevity, older individuals succumb to certain health conditions, which may affect their respiratory, cardiac, reproductive, neuropsychological and musculo-skeletal functioning (Pellicer, Simon & Remohi 1995; Woolf 2003; Bixby 2007).

Health disparities and sex differences were brought to the forefront in this survey, which shows there is a significant difference in the perception of overall health status among whites, who have historically been economically stronger, than among black Africans, coloureds and Indians (African Economic Outlook 2006; Ghosh 2012). Whites reported better perceived health status compared to the other race groups. In addition, those participants residing in rural informal areas reported worse health status than those residing in other areas. By virtue of the fact that these participants reside in an informal area means that they are economically disadvantaged and have poor living conditions. There is ample evidence in the 'social determinants of health' literature that people living in poor conditions with limited resources have poor health outcomes (Gracey & Malcolm 2009; WHO 2010; De Snyder, Salgado, Friel et al. 2011). Finally, it is interesting that the women in rural formal areas reported better health status, when compared with other localities. This sex difference could possibly point to the fact that these women live in female-dominated households, which is common in rural areas, because the men go to the cities to work or look for paid work (Horrell & Krishnan 2007; International Fund for Agricultural Development 2011; Esim & Omeira 2009). Women in these circumstances perhaps internalise the fact that they have to be the responsible home-maker and be physically and mentally strong. They are, therefore, reluctant to report poor health.

As far as daily work and household functioning are concerned only a very small percentage of the participants in the survey reported mild disability in the last 30 days prior to the interview. Inequalities as a determinant of health in South Africa are apparent when daily functioning is assessed. Male and female black Africans, who were historically disadvantaged, reported higher levels of disability, albeit mild, as compared to whites, coloureds and Indians. The prevalence of self-rated difficulty with work or household activities in this study was found to be similar to a study among adults aged 50 years or older in South Africa 2007–2008 (Phaswana-Mafuya, Peltzer, Chirinda et al. 2013). Provincial differences were also apparent in the survey although it was restricted to Free State, Mpumalanga and Western Cape, with Western Cape reporting better health status. This finding is important in that it possibly demonstrates that people in Western Cape indeed enjoy better health (Botha 2011) than people in Free State and Mpumalanga but more importantly, it highlights the fact that Western Cape has better public and private health-care models, which allows easier and more ready access to health care than in the other two provinces (Health Systems Trust 2012).

Disability and activities of daily living

The level of disability reported in this survey was exceptionally low across all age groups. There was, however, consistency in the trend across all age groups with the younger group reporting less disability than older groups. This pattern is commonly reported in the literature.The results of this survey differ from the results of the SAGE study, which reports a much higher level of disability among the 50 years and older group (Phaswana-Mafuya, Peltzer, Chirinda et al. 2013). Both surveys use the same tool to measure overall disability. A possible explanation is that the differences between the two survey results are due to the fact that the sample of SAGE oversampled the elderly while the sample in this survey was more representative of the elderly in the general population. Nevertheless, the results of this study do suggest that special attention must be paid to differences in disability in rural/urban and formal/informal areas, as well as interprovincial differences such as Mpumalanga, Free State, KwaZulu-Natal, Limpopo, North West and Gauteng scoring marginally high on disability compared to a province such as Western Cape.

The activities for daily living showed an age trend similar to that of the overall disability of the sample with younger participants showing fewer difficulties in carrying out their day-to-day tasks. Once again, it is important to consider the interprovincial, urban/rural, racial and sex disparities that emerged with respect to the inability to carry out daily activities. These structural factors need to be considered when the health care system is re-engineered in order to service those who need it most.

Impaired vision and hearing

Similar to health status and daily physical functioning, as people become older, their ability to see (vision) and hear well deteriorates (Wallhagen, Strawbridge, Shema et al. 2001; Jang 2003; Brennan 2005; Smith 2008). The fact that the younger participants in this survey have better near-sighted vision, far-sighted vision and hearing ability as compared to older individuals confirms what the existing literature reports (Grue, Ranhoff, Noro et al. 2009). The results show a trend in the deterioration of near-sightedness, far-sightedness and hearing with age. The fact that black Africans were found to have better sight could be associated with many factors, including a genetic heritage for better sight (Nuru-Jeter/ Health and Medicine Week 2011). The flip side to this argument, however, is that the assessment of visual impairment, in this survey, was done by asking a question about whether the participant wears glasses to improve their vision and a yes response was used as a proxy measure for impairment. It could very well be that black Africans stated that they do not wear glasses without really knowing the status of their vision. Access to eye health and the cost of aids for eye health, such as glasses and prescription medication is prohibitively expensive, and these factors pose as barriers to care (Kronfol 2012).

There were provincial and sex differences noted in visual and hearing impairment although it is difficult to surmise why this might be the case. A common sense approach to explaining this variation might be based on the fact that it reflects genetic differences with respect to the predisposition for visual and hearing impairment combined with the fact that access to health care varies across provinces.

Psychological distress (Kessler, K-10)

The overall mean psychological distress score was higher for older people, females and those living in rural informal areas. It is, therefore, important for health authorities to recognise the burden of psychological distress among these specific groups of vulnerable individuals and implement targeted interventions. As a large number of people lie within the existing population age, it is critical to focus on this specific subgroup as well. In the literature on human development, it is highlighted that each age and stage in life is accompanied by certain challenges, which most individuals hope to resolve (Department of Health [UK] 2004; Keating 2004; Suckling 2008). In the event that these difficulties remain unresolved, the likelihood of developing psychological distress increases. In this survey, the middle-to-older age groups were psychologically vulnerable and so were individuals in the Free State. The Western Cape showed a low prevalence of psychological distress.

Age and sex for the intensity of distress (low, moderate, high and very high) was similar to overall distress with older individuals and females reporting higher levels of the varying intensity of distress. In addition, the fact that black Africans and participants from most of the provinces except Western Cape reported higher levels of distress once again calls to attention the need for health authorities to target mental health interventions for populations where it is most required.

Traumatic events

At a national level, family-related trauma events were the most reported event, followed by events associated with personal assault, and 'other traumatic events' in this survey. Highly personalised experiences of traumatic events were the most prevalent. This comprised not only of a violent act directed at the participant, such as a sexual assault, but also of secondary knowledge of these violent acts directed at family members. While the lifetime experience of traumatic events, such as losing a loved one through death, is a natural and expected part of the human journey (Wartman & Boerner 2011), primary and secondary exposure to violent events is unexpected and may serve as precursor to severe mental distress and possibly PTSD (Ahmend 2008; Catherall 2008; Shalev 1998). Of course, the fact that older participants in this study had a higher prevalence of experiencing traumatic events is unsurprising because they have lived longer and are consequently more than likely to have had exposure to traumatic events in their lifetime.

Participants residing in the rural areas appear to be more protected against experience of traumatic events. This is possibly due to a higher level of social capital and social cohesion experienced in these communities (Campbell 2004; Hirini, Flett, Long et al. 2005).The sociological literature points to the fact that as societies become more urbanised, they become more individualistic, which often leads to a sense of alienation, making them more vulnerable to trauma exposure (Salgado de Snyder 2011; Vandello 1999; Veenhoven 1999).

Of note is the fact that interprovincial differences were reported with respect to family-related trauma with certain provinces, such as Eastern Cape, Free State and KwaZulu-Natal reporting higher levels. This fact highlights the plight of individuals who live in these provinces. Some of these provinces are some of the most impoverished in the country (for example, Eastern Cape) (Provide Project Background Paper 2005) with high unemployment figures accompanied by high levels of social ills (Provide Project Background Paper 2005). Once again the implication from these findings is that greater advocacy work needs to be done in trauma-related high burden provinces. Mental health services should also be prioritised.

Symptoms of PTSD and screening for PTSD

It is interesting to note that the percentage of both males and females symptomatic for PTSD in this survey was higher than the diagnosis for PTSD. It will be interesting to calculate whether there is a significant correlation between PTSD symptoms and diagnosis of PTSD (see study by Declercq & Willemsen 2006). Black Africans reported more PTSD symptoms than whites indicating that they are at risk for developing the diagnosis of PTSD. Indeed previous studies conducted among black Africans in primary health care (Carey, Stein, Zungu-Dirwayi et al. 2003) and community-based samples have found high rates of PTSD symptoms in this group and have linked these to experiences to past human rights violations (Zungu-Dirwayi, Kaminer, Mbanga et al. 2004; Atwoli, Steyn, Williams et al, 2013).

The reporting of PTSD symptoms is associated with a diagnosis of PTSD. In this survey, there were interesting findings that were not entirely consistent with the trends seen in the psychological distress and reporting of PTSD symptoms results.

Further interrogation of these findings is necessary to understand why the prevalence of PTSD is higher in certain subgroups of individuals and why those living in particular areas are more vulnerable to PTSD. Common sense notions and evidence in the literature point to the fact that some provinces in South Africa report a higher number of violent crimes than other South African provinces. These violent acts include violence against the farming community, family murders and other crimes such as sex-based violence (Stats SA 2006; Stats SA 2012). A diagnosis of PTSD can result from experiencing a traumatic event at a personal level or as a witness. Essentially, trauma exposure is associated with the development of PTSD (DSM-V 2013; Morris, Naidoo, Cloete et al. 2013).

Conclusion

The trends found for self-reported health status, daily functioning, disability and visual and hearing impairment were not unexpected in that older participants had worse overall functioning than younger ones. However, this is an important finding because it brings to attention that the population is aging and needs to have specialised health care services and indeed greater access to health care.

Older participants, black Africans, those in rural informal, participants from all provinces and females were particularly vulnerable to psychological distress. There is a high level of crime reported in South Africa, including family-related traumatic events, which was were frequently reported in this study. Finally, while the prevalence for PTSD was relatively low, the prevalence of PTSD symptoms was reportedly extremely high. It is essential therefore to include mental health and social work services at key health facilities throughout South Africa. This is essential given the fact that WHO has also cautioned about the fact that depression poses a high burden at a global health level.

3.10 Use and perceptions of the quality of health care services

In order to understand the effectiveness and quality of the South African health care system, one must take into account utilisation patterns and perceptions thereof. Access to health care services is understood to be not just about utilisation of health care services, but also includes the non-use of services, which highlights existing barriers to access health care and quality of services provided. Barriers to accessing health care services include the availability of health services, the affordability of services and the acceptability of services (McIntyre, Okorafor, Ataguba et al. 2008). These barriers contribute to inequitable health outcomes among the citizens of a particular country. The disparities in accessing health care services limit individuals from reaching their full potential and negatively affects their quality of life (Szczepura 2005). Health service utilisation is important to assess because of its strong relationship with perceived quality of care. Health care users' perceptions of quality health care services are determined by, inter alia, the conduct of staff, the availability of needed care, waiting time and the acceptability of the health care service. The acceptability of the service depends on the health providers' attitudes and practices (Bakeera, Wamala, Galea et al. 2009). Good access to health care services is reflected by utilisation rates. Underutilisation of health care services is a serious problem (McGlynn, Asch, Adams et al. 2003). Knowing utilisation rates or what proportion of the population is utilising both inpatient and outpatient services is therefore important in order to understand issues pertaining to health care access and perceived quality.

Seeking care in a timely manner is one dimension of good access to health care. Delays in accessing health services have been associated with negative health outcomes for patients (Kenagy, Berwick & Shore 1999). This includes an increased risk of mortality (Guttmann, Schull, Vermeulen et al. 2011; Prentice & Pizer 2007), reduction in psychological wellbeing, depression, distress, and reduced vitality (Hirvonen 2007). Therefore, it is important to know whether South African health services are accessed when care is needed.

Understanding the reasons patients seek health care is critical for meeting patients' needs; understanding the burden of disease; and identifying strains on the health system. Patients seek health care services for different reasons; some have a desire to obtain medical information, while some need psychological assistance, general health advice, and biomedical treatment (Like & Zyzanski 1986). Identifying common reasons why patients utilise health facilities will better enable those facilities to plan and provide quality care. Furthermore, such knowledge can be used to bolster prevention initiatives to decrease the need for medical care. It may also contribute to understanding where the burden on the health system may be; for example, with acute care or chronic care.

Perceptions of health care quality and satisfaction with services are important for assessing the quality of the health system as it is experienced by patients. There is growing attention being paid to public perceptions of health care and patient experience as a source of health care quality (Sofaer & Firminger 2005). Patients' perceptions of health care have been empirically linked to health system performance (Soroka & Maioni 2013), health care quality (Aharony & Strasser 1993; Donabedian 1992) and perceived problems in health care delivery (Cleary & McNeil 1988). WHO developed the concept of health system 'responsiveness,' which is based on patient experience and refers to the manner and environment in which patients are treated (Valentine, De Silva, Kawabata et al. 2003). Patient perceptions can be utilised for evaluating performance as part of quality improvement programmes (Sixma, Kerssens, Campen et al. 1998).

Various studies suggest that perceived quality of health care service has a strong impact on utilisation patterns. Positive perceptions encourage use of health care services (Thomas & Penchansky 1984), whereas negative perceptions of health care deter the public from seeking needed health care (Andaleeb 2001; Ginsburg, Slap, Cnaan et al. 1995). For instance, a study of urban health centres in Lusaka found an association between poor perception of health services and delay in seeking care (Godfrey-Faussett, Kaunda, Kamanga et al. 2002).

Public perceptions of health care systems are also important to assess because negative perceptions can have a direct influence on public health by impacting on patient behaviour and health. Positive perceptions of health care services promote adherence and cooperation with medical regimens and advice (Bartlet 2002; Golin, DiMatteo & Gelberg 1996; Wartman, Morlock, Malitz et al. 1983; Zapka, Palmer, Hargraves et al. 1995). Satisfaction with health care services is important for maintaining positive relationships between patients and health care providers (Marquis, Davis & Ware 1983). Patient perceptions also drive rates of complaints (Taylor, Wolf & Cameron 2002), grievances (Halperin 2000), and malpractice claims (Hickson, Federspiel, Pichert et al. 2002). Ultimately, patients who are dissatisfied with health care are more likely to have poor health outcomes (Cleary & McNeil 1988; Covinsky, Rosenthal, Chren et al. 1998; Kane, Maciejewski & Finch 1997; Marshall, Hays & Mazel 1996).

As South Africa begins its transition to universal health coverage through National Health Insurance (NHI), it is of utmost importance that repeat surveys collect data on the health care system in order to assess the current status of the health services provision and also for comparison with the future service provision under NHI. SANHANES-1 included questions on health care utilisation and perceptions of health care services. The results are presented in the sections below.

3.10.1 General health care

In this section, the focus is on the years since health care was last received, accessing needed health care services and reasons for seeking care at last visit to a health care facility.

3.10.1.1 Years since health care last received

The mean duration (years since health care was last received from the private health sector and the public health sector) are discussed in this section.

Mean duration (years) since health care was last received from the private health sector

Table 3.10.1.1.1 shows the mean duration since respondents received care from a private sector provider. On average, respondents sought care in the private sector 1.8 years prior to the study. In this study, females on average had sought care in the private sector 1.6 years earlier, while males had last received health care in the private sector 2.0 years earlier on average. The period since respondents from different age groups received care from the private sector was just less than two years except for the group aged 65 years and older which was less (1.4 years). Young people aged 15–24 years were significantly less likely than all the older age groups to have needed care from the private sector, and similarly those aged 25–34 were significantly less likely than 45–54, 55–64 and 65 or older age groups to have ever needed care from the private sector. Residents of rural informal areas were significantly less likely than urban formal residents to seek care in the private sector, but there were no significant differences in duration since the last visit to a private health facility. The results also show that 36.1% of adult South Africans used the private sector at some point for health care with a similar percentage reporting never to have sought care in the private sector (38.5%).

Provincial data show differences in the rates of seeking care in the private sector. Western Cape residents (60.9%) were more likely to seek care in the private sector than those of all other provinces, except those of Northern Cape (54.5%) and Free State (53%). North West (65.0%) had the highest rate of population that never used the private sector followed by Mpumalanga at 52.3%. In the remaining provinces, less than 42% of the population had never used the private sector.

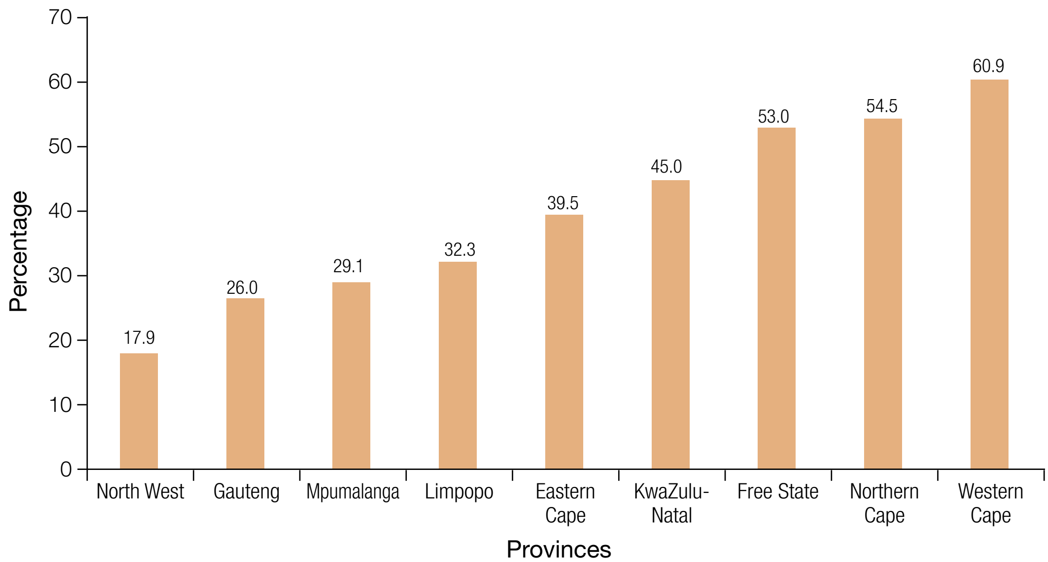
Black Africans (1.7 years) had a statistically shorter mean duration since the last visit made to the private sector facilities when compared to coloured (2.3 years) respondents. However, black Africans were significantly less likely (30.8%) than all other race groups to use the private sector for health services.

Table 3.10.1.1.1: Mean duration (years) since health care was last received from the private health sector among all participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

	Mean duration (years) since health care was last received from a private doctor/hospital/clinic									
			Total	Ever needed		Don't know		Never		Total
Background characteristics	Mean	95% CI	n	%	95% CI	%	95% CI	%	95% CI	n
Sex										
Male	2.0	[1.7–2.4]	1 438	33.6	[30.6–36.8]	27.2	[23.4–31.4]	39.2	[35.8–42.6]	6 107
Female	1.6	[1.4–1.8]	2 007	38.3	[35.3–41.4]	23.8	[20.9–27.0]	37.9	[34.9–40.9]	8 634
Age										
15–24	1.9	[1.4–2.3]	778	26.7	[23.8–29.8]	24.5	[21.2–28.2]	48.7	[45.1–52.4]	4 170
25–34	1.6	[1.3–1.9]	686	33.9	[30.0–38.0]	27.0	[22.4–32.2]	39.1	[35.0–43.3]	2 903
35–44	2.0	[1.6–2.5]	626	37.9	[34.0–41.9]	27.4	[22.8–32.4]	34.8	[31.0–38.7]	2 417
45–54	1.9	[1.5–2.4]	611	44.0	[40.1–48.0]	25.1	[20.8–30.1]	30.8	[27.4–34.4]	2 206
55–64	1.8	[1.4–2.3]	425	48.7	[44.7–52.7]	21.5	[18.2–25.4]	29.8	[25.6–34.3]	1 677
65+	1.4	[1.0–1.8]	319	44.9	[39.3–50.7]	23.7	[19.4–28.6]	31.4	[26.7–36.5]	1 364
Locality										
Urban formal	1.7	[1.4–2.0]	2 115	40.6	[36.0–45.4]	28.1	[23.1–33.7]	31.3	[26.8–36.2]	8 011
Urban informal	1.8	[1.4–2.2]	385	31.8	[24.7–39.8]	18.8	[14.0–24.8]	49.4	[43.8–55.0]	1 823
Rural formal	1.9	[1.2–2.6]	362	30.4	[21.4–41.3]	26.0	[16.3–38.9]	43.6	[36.8–50.6]	1 820
Rural informal	2.2	[1.8–2.5]	585	29.0	[25.8–32.5]	21.6	[18.6–25.0]	49.4	[45.4–53.3]	3 093
Province										
Western Cape	2.3	[1.8–2.8]	610	60.9	[53.2–68.1]	13.4	[10.8–16.4]	25.8	[20.4–31.9]	2 081
Eastern Cape	2.1	[1.6–2.5]	324	39.5	[34.0–45.2]	25.0	[21.0–29.4]	35.6	[30.8–40.7]	1 608
Northern Cape	2.1	[1.5–2.7]	293	54.5	[46.6–62.1]	18.1	[14.4–22.5]	27.4	[20.7–35.4]	976
Free State	1.8	[1.3–2.3]	232	53.0	[44.7–61.2]	12.0	[8.2–17.4]	35.0	[27.7–43.0]	796
KwaZulu–Natal	2.2	[1.8–2.6]	675	45.0	[39.3–50.8]	14.0	[11.3–17.3]	41.0	[35.7–46.6]	2 415
North West	1.4	[0.9–2.0]	185	17.9	[13.6–23.0]	17.1	[12.8–22.6]	65.0	[58.2–71.3]	1 863
Gauteng	1.3	[0.8–1.8]	534	26.0	[20.3–32.6]	40.8	[32.5–49.5]	33.2	[26.0–41.4]	2 532
Mpumalanga	1.4	[0.7–2.0]	306	29.1	[22.4–36.8]	18.6	[13.5–25.1]	52.3	[44.5–60.0]	1 298
Limpopo	1.8	[1.4–2.3]	288	32.3	[25.7–39.6]	25.7	[20.0–32.3]	42.0	[37.1–47.1]	1 178
Race										
African	1.7	[1.4–2.0]	1 985	30.8	[27.8–34.1]	25.9	[22.1–30.2]	43.2	[39.6–47.0]	9 784
White	1.7	[1.2–2.3]	245	57.3	[48.0–66.1]	28.6	[20.3–38.6]	14.1	[9.2–21.0]	690
Coloured	2.3	[2.0–2.7]	816	50.2	[44.9–55.5]	19.7	[16.2–23.7]	30.1	[25.5–35.2]	2 973
Asian/Indian	2.0	[1.4–2.6]	382	56.0	[47.3–64.4]	17.0	[12.2–23.3]	27.0	[17.8–38.7]	1 248
Total	1.8	[1.6–2.0]	3 428	36.1	[33.3–39.0]	25.4	[22.2–28.9]	38.5	[35.5–41.5]	14 695

95% CI: 95% confidence interval

Figure 3.10.1.1.1: Ever reporting having needed services from the private health sector by province, South Africa 2012



Mean duration (years) since health care was last received from the public health sector

On average, the last time respondents ever needed care in the public sector was about two years prior to the study, a figure that is not statistically significantly different from the 1.8 years in the private sector. There were no significant differences by sex in mean duration since last seeking care in the public sector. The results show that 45.8% of the respondents who needed health care had ever used the public sector. Females (52.4%) were statistically significantly more likely to have reported ever seeking care in a public health facility compared to males (38.6%). Young adults aged 15–24 years were less likely to seek health care from the public sector than all adult age groups 55 years and older. However, in comparison with the private sector, a higher percentage of young adults aged 15–24 years received health care in public sector (40.5%) than in the private sector (26.7%). Adults 65 years and older (58.9%) and those aged 55–64 years (55.7%) were significantly more likely than all age groups under 45 to seek health care from the public sector, which was below 46%.

There were no significant mean differences in the duration since care was last sought in the public sector by locality (Table 3.10.1.1.2). However, there was a statistically significant difference in ever having needed care in the public sector between residents living in rural informal areas (56.3%) compared with rural formal (39.1%) and urban formal area residents (40.6%). Provincial differences in mean duration since the last visit to a public sector were not statistically significant; however, differences in the rate of ever having needed care were evident. KwaZulu-Natal (66.2%) had significantly higher rates of the respondents compared to residents of North West, Gauteng, Mpumalanga, Limpopo and Western Cape (range 32.5% to 52.9%) who had ever needed to use the public sector health facilities. Only Northern Cape and Free State residents did not differ from KwaZulu-Natal in the rate of needing public sector care services. Racial differences were apparent in the need to use the public health sector. Whites (23.4%) were far less likely than coloureds (49.4%) and black Africans (48.6%) to have ever needed care in the public sector.

Table 3.10.1.1.2: Mean duration (years) since health care was last received from the public health sector among all participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	Mean duration (years) since health care was last received from a public hospital/clinic									
			Total	Ever needed		Don't know		Never needed		Total
	Mean	95% CI	n	%	95% CI	%	95% CI	%	95% CI	n
Sex										
Male	2.2	[1.9–2.5]	1 586	38.6	[35.5–41.7]	33.9	[30.2–37.8]	27.5	[24.7–30.6]	6 130
Female	1.8	[1.5–2.0]	2 317	52.4	[49.5–55.2]	26.9	[24.0–30.0]	20.7	[18.5–23.1]	8 632
Age										
15–24	1.8	[1.5–2.1]	1 072	40.5	[37.3–43.8]	32.8	[29.2–36.6]	26.7	[23.8–29.8]	4 208
25–34	2.0	[1.6–2.3]	810	44.0	[40.0–48.2]	32.1	[27.6–36.9]	23.9	[20.6–27.5]	2 921
35–44	2.4	[1.8–3.0]	686	45.3	[41.1–49.6]	31.4	[26.8–36.4]	23.2	[19.8–27.1]	2 417
45–54	2.5	[1.9–3.0]	569	47.9	[43.0–53.0]	28.2	[24.3–32.3]	23.9	[19.5–28.9]	2 195
55–64	1.4	[1.1–1.8]	440	55.7	[50.4–60.9]	24.0	[20.6–27.8]	20.3	[16.5–24.7]	1 666
65+	1.2	[0.8–1.6]	328	58.9	[53.2–64.4]	21.6	[18.1–25.5]	19.5	[14.8–25.3]	1 351
Locality										
Urban formal	2.0	[1.7–2.4]	2 014	40.6	[36.5–44.9]	32.8	[28.0–38.0]	26.6	[22.6–30.9]	7 981
Urban informal	1.8	[1.4–2.1]	544	54.9	[47.3–62.2]	22.9	[16.6–30.9]	22.2	[18.1–26.9]	1 827
Rural formal	1.9	[1.4–2.5]	448	39.1	[31.2–47.6]	34.8	[24.5–46.6]	26.1	[21.0–32.0]	1 801
Rural informal	1.9	[1.6–2.2]	899	56.3	[52.3–60.2]	25.7	[22.2–29.5]	18.0	[15.4–21.0]	3 159
Province										
Western Cape	2.4	[1.8–3.0]	609	47.7	[41.5–54.1]	18.6	[15.7–21.9]	33.7	[28.2–39.7]	2 073
Eastern Cape	2.0	[1.6–2.4]	402	52.9	[47.8–58.0]	33.6	[28.8–38.7]	13.5	[10.4–17.3]	1 584
Northern Cape	1.7	[1.0–2.4]	244	58.2	[50.0–65.9]	19.0	[14.5–24.5]	22.8	[15.8–31.7]	969
Free State	2.4	[1.7–3.1]	238	57.2	[49.6–64.4]	12.4	[9.1–16.7]	30.4	[23.5–38.4]	783
KwaZulu-Natal	2.1	[1.6–2.5]	664	66.2	[61.6–70.6]	12.4	[9.9–15.3]	21.4	[18.0–25.3]	2 430
North West	1.9	[1.3–2.6]	295	36.6	[32.2–41.3]	30.2	[24.2–37.0]	33.2	[27.5–39.4]	1 871
Gauteng	1.8	[1.2–2.3]	630	32.5	[26.5–39.1]	44.9	[37.6–52.5]	22.5	[16.9–29.4]	2 540
Mpumalanga	1.8	[1.2–2.3]	409	44.7	[38.7–50.8]	22.5	[16.2–30.2]	32.8	[25.2–41.5]	1 302
Limpopo	1.7	[1.2–2.1]	414	50.0	[42.6–57.4]	33.2	[26.5–40.7]	16.8	[13.7–20.5]	1 216
Race										
African	1.9	[1.6–2.1]	2 726	48.6	[45.3–51.9]	31.6	[27.8–35.7]	19.8	[17.7–22.2]	9 834
White	2.4	[1.4–3.4]	129	23.4	[16.5–32.1]	27.6	[20.6–36.0]	49.0	[40.4–57.7]	672
Coloured	2.2	[1.8–2.6]	788	49.4	[44.3–54.4]	24.9	[20.8–29.5]	25.7	[20.9–31.2]	2 964
Asian/Indian	2.9	[2.0–3.8]	244	38.1	[28.5–48.7]	16.8	[12.3–22.4]	45.2	[38.5–52.0]	1 249
Total	2.0	[1.7–2.2]	3 887	45.8	[43.0–48.7]	30.2	[27.1–33.6]	23.9	[21.6–26.5]	14 719

95% CI: 95% confidence interval

Figure 3.10.1.1.2: Ever reporting having needed services from the public health sector, by province in South Africa 2012

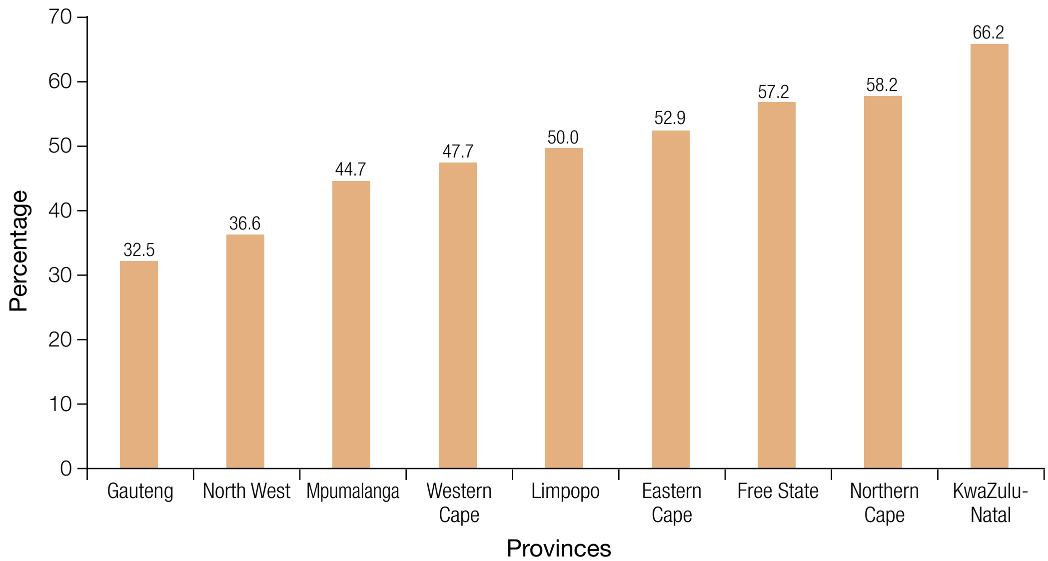


Table 3.10.1.2.1: Percentage of all participants aged 15 years and older who received health care the last time health care was needed by race, South Africa 2012

	Yes		No		Total
Race	%	95% CI	%	95% CI	n
African	96.0	[94.9–96.9]	4.0	[3.1–5.1]	4 310
White	99.4	[98.4–99.8]	0.6	[0.2–1.6]	365
Coloured	98.2	[97.2–98.9]	1.8	[1.1–2.8]	1 841
Asian/Indian	98.9	[97.7–99.4]	1.1	[0.6–2.3]	735
Total	96.8	[95.9–97.4]	3.2	[2.6–4.1]	7 251

95% CI: 95% confidence interval

3.10.1.2 Accessing needed health care services

Delaying access to needed health care can negatively impact on population health. To assess whether the South African population has adequate access to services, participants over the age of 15 were asked whether they had been able to receive health care the last time they needed it.

The study assessed the extent to which the participants received care when needed. The results showed that the majority (96.8%) of respondents over the age of 15 were able to access services, when needed. Rates did not differ when analysed by sex, age, locality, or province (Table 3.10.1.2.1).

Analysis of data by race shows that although access to health care was higher than 95%, there were racial disparities in access to needed health care. All the races accessed needed services at a significantly higher rate than black Africans.

3.10.1.3 Reason(s) for seeking care at last visit to a health care facility

In order to measure what types of diseases and conditions may be burdening the health sector, respondents were asked the reason why they last sought care from health facilities.

Reasons for accessing health services were categorised as acute, chronic, communicable, or other. Acute conditions included diarrhoea, fever, flu, headaches, cough, stomach, muscle, and non-specific pain. Chronic conditions included chronic pain in joints or arthritis, diabetes or related complications, heart problems including unexplained chest pain, high blood pressure or hypertension, stroke or sudden paralysis of one side of the body, cancer, depression or anxiety. Communicable diseases included infections, malaria, TB, and HIV. Other conditions included maternal and perinatal conditions (pregnancy), nutritional deficiencies, surgery, sleep problems, mouth, teeth or swallowing problems, breathing problems, injury, occupational or work related injury, and other.

Over a third of respondents reported that their reason for needing care from a doctor or hospital the last time was due to an acute condition (38.4%) and other condition (40.3%) (Table 3.10.1.3.1). A lower proportion of respondents (18%) reported a chronic condition as their reason for needing care; this was significantly lower than acute or other reasons ($p < 0.05$). Only a very small proportion of respondents (3.3%) reported a communicable condition as their reason for needing care, significantly lower than all three other reasons (acute, other, and chronic) ($p < 0.05$).

An analysis of data by sex showed that males (40.3%) tended to seek care for acute conditions at a higher level than females (37.1%), while females sought care for chronic conditions significantly more than males (19.9% compared to 15.3%) and males were twice more likely than females to seek care for communicable diseases (4.7% compared to 2.4%), which was statistically significant ($p < 0.05$).

Seeking chronic disease care was positively correlated with age. Young people aged 15–24 tended to seek chronic care the least, at 5%, increasing to the oldest age category of 65 and older, where 46.8% sought care for chronic illness. The prevalence of young people aged 15–24 seeking care for chronic illness was significantly lower than age categories over 35 years of age ($p < 0.05$), and the prevalence of people aged 65 and older was significantly higher than other age categories ($p < 0.05$). People aged 55–64 and over 65 were more likely to seek care for chronic illness more than for acute, communicable, or other reasons ($p < 0.05$). Levels of seeking care for communicable diseases increased with age, among young people aged 15–24, it was 1.9%, peaking among the 35–44 age group at 5%, then decreasing with old age with the lowest level found among the over 65 age category (0.9%). Young people (15–24 years) were likely to seek care the most for other conditions at a level of 47.7%. As age increases, levels of seeking care for other conditions decreases, with people over the age of 65 seeking care at less than half the level of young people (27.9% compared to 47.7%), with differences significant ($p < 0.05$).

Residents of urban formal areas (40.6%) were more likely to seek acute care than respondents in rural informal localities ($p < 0.05$). Other differences when analysed by locality were not statistically significant ($p > 0.05$). The analysis of data by province shows that residents of the North West tended to report seeking care for chronic illnesses at a rate much higher than in other provinces (39.8%); differences were statistically significant ($p < 0.05$). Residents in the North West were also statistically significantly less likely to seek care for acute conditions ($p < 0.05$). Other differences among provinces were not significant ($p > 0.05$).

When the responses were analysed by race, the differences observed among race groups for acute, chronic, and other reasons for seeking care were not significant. However, it appears that black Africans were more likely to seek care for communicable illness at a higher rate (4.2%) compared to other race categories, these differences were significant ($p < 0.05$).

Table 3.10.1.3.1: Reason(s) care was needed the last time among all participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	Reason(s) for care the last time a doctor/hospital was needed								
	Acute		Chronic		Communicable		Other		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex									
Male	40.3	[37.4–43.2]	15.3	[13.4–17.4]	4.7	[3.6–6.1]	39.7	[36.5–43.1]	2 639
Female	37.1	[34.6–39.7]	19.9	[18.4–21.6]	2.4	[1.8–3.0]	40.6	[38.1–43.2]	4 452
Age									
15–24	45.4	[41.7–49.2]	5.0	[3.5–7.1]	1.9	[1.3–2.8]	47.7	[44.1–51.2]	1 616
25–34	40.5	[37.1–43.9]	8.2	[6.5–10.3]	4.6	[3.3–6.4]	46.7	[42.9–50.5]	1 303
35–44	42.0	[38.1–45.9]	13.7	[11.2–16.7]	5.0	[3.6–7.0]	39.3	[35.3–43.4]	1 241
45–54	32.8	[28.9–36.8]	29.7	[25.9–33.8]	3.6	[2.5–5.3]	33.9	[29.9–38.1]	1 232
55–64	32.4	[27.1–38.3]	33.1	[27.5–39.2]	2.3	[1.4–4.0]	32.1	[27.5–37.2]	943
65+	24.5	[19.3–30.6]	46.8	[40.1–53.5]	0.9	[0.3–2.3]	27.9	[21.4–35.4]	754
Locality									
Urban formal	40.6	[37.9–43.4]	17.9	[16.0–19.9]	2.8	[2.0–3.9]	38.7	[35.6–41.9]	4 089
Urban informal	38.9	[34.3–43.7]	15.0	[11.7–18.9]	3.4	[2.2–5.3]	42.7	[37.7–47.9]	783
Rural formal	33.9	[28.8–39.3]	21.7	[17.1–27.2]	3.0	[1.9–4.8]	41.4	[35.8–47.3]	777
Rural informal	34.5	[31.5–37.6]	18.3	[15.9–21.0]	4.6	[3.5–6.1]	42.6	[39.5–45.8]	1 443
Province									
Western Cape	35.2	[30.1–40.6]	17.3	[14.9–20.0]	2.1	[1.4–3.2]	45.4	[40.6–50.4]	1 364
Eastern Cape	37.8	[32.1–43.9]	16.1	[12.9–19.9]	3.5	[1.9–6.4]	42.6	[38.0–47.3]	774
Northern Cape	36.7	[30.6–43.3]	26.6	[22.5–31.3]	2.0	[0.7–5.2]	34.6	[29.5–40.2]	592
Free State	40.2	[34.4–46.4]	16.1	[12.8–20.0]	3.1	[1.4–6.8]	40.5	[33.3–48.3]	404
KwaZulu-Natal	38.8	[35.1–42.7]	16.0	[13.3–19.2]	3.6	[2.3–5.5]	41.6	[37.1–46.1]	1 433
North West	22.3	[17.5–28.0]	39.8	[34.2–45.8]	7.0	[4.6–10.4]	30.9	[26.3–35.9]	569
Gauteng	45.5	[41.7–49.3]	16.6	[13.5–20.2]	2.7	[1.5–5.0]	35.2	[29.9–41.0]	878
Mpumalanga	34.9	[28.9–41.4]	16.4	[12.2–21.6]	7.8	[5.6–10.7]	41.0	[35.2–47.0]	510
Limpopo	37.3	[32.3–42.6]	15.4	[11.6–20.2]	2.2	[1.2–4.0]	45.1	[39.4–50.9]	568
Race									
African	39.5	[37.4–41.6]	17.1	[15.7–18.7]	4.2	[3.4–5.1]	39.2	[36.8–41.7]	4 208
White	36.3	[28.5–44.9]	20.3	[14.8–27.2]	0.1	[0.0–0.8]	43.3	[35.6–51.4]	363
Coloured	34.2	[30.8–37.7]	20.0	[17.4–22.9]	2.1	[1.3–3.5]	43.7	[40.0–47.5]	1 805
Asian/Indian	38.4	[27.1–51.2]	21.7	[17.5–26.6]	0.4	[0.1–1.4]	39.5	[29.2–50.8]	699
Total	38.4	[36.5–40.3]	18.0	[16.7–19.4]	3.3	[2.7–4.0]	40.3	[38.2–42.4]	7 090

95% CI: 95% confidence interval

3.10.2 Inpatient care utilisation patterns

The use of inpatient services is often seen as an indication of severity of illness. In order to measure the population utilisation of inpatient services, respondents were asked if they had stayed overnight in hospital or another type of health care facility in the last 12 months. The focus on recent use of health services is to address recall bias, which often occurs when the question asked may require a recall of events that occurred over a period longer than one year. Table 3.10.2.1 summarises the utilization patterns for inpatient care.

The results show that 9.1% of the population 15 years and older received inpatient care in the last 12 months. However, females (10.8%) were significantly more likely than males (6.8%) to have been in-patients at a health facility once within a year. A small proportion stayed in an inpatient facility more than once. Residents of urban informal areas were significantly less likely than residents in rural informal areas to have stayed in inpatient facilities. However, there were no significant differences by age or race in inpatient stays.

3.10.2.1 Type of facility inpatient care last received

The South African health care system is fragmented, with a large proportion of the population relying on the public health sector with limited resources for the provision of health care, while a small proportion relies on a wellfunded private health system. Participants who used inpatient health facilities were asked to specify the type of facility accessed in an attempt to understand the size of the populations seeking health care in the public or private sector. Table 3.10.2.1.1 presents results of the type of health facility in which participants received care in the last 12 months by sex, locality and race of the respondent.

Less than three-quarters (71%) of the population who received care in inpatient facilities received it in public hospitals as opposed to private hospitals. The rate of use of inpatient care services did not significantly vary sex of respondents even though females (72.4%) were more likely to use health facilities as inpatient than males at 68.3%. Respondents living in rural informal (89%) and urban informal (89.4%) areas used public health services at greater rates compared to those living in rural formal (65.2%) and urban formal (63%) residents. Although urban formal residents had greater access to private health services, there was no significant difference between rural formal (34.8%) and urban formal (35.7%) residents in the use of private hospitals for inpatient care. Whites at 64.8% were three times more likely to use private hospitals than black Africans at 19%. Levels of use of private inpatient care services did not vary among Indians (49%) and coloureds (29.9%). There were too few cases of all races who received care in other inpatient facilities to allow for meaningful analysis.

Table 3.10.2.1: Frequency of inpatient visits (overnight stays) in a health care facility in the past 12 months among all participants aged 15 years and older by sex, age, locality, province, and race; South Africa 2012

Background characteristics	Frequency of inpatient visits (overnight stays) in the last 12 months (males and females)										
	Once		2–3 times		4 or more		None		Don't know		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex											
Male	6.8	[5.5–8.2]	2.0	[1.4–2.7]	1.7	[1.1–2.4]	88.1	[86.3–89.7]	1.6	[1.0–2.5]	2 739
Female	10.8	[9.3–12.6]	3.0	[2.3–3.8]	1.2	[0.9–1.6]	83.8	[82.0–85.5]	1.2	[0.8–1.7]	4 624
Age											
15–24	8.7	[6.9–11.0]	2.6	[1.5–4.3]	0.8	[0.5–1.4]	86.4	[83.9–88.5]	1.5	[0.9–2.5]	1 670
25–34	10.5	[8.4–13.0]	2.6	[1.7–3.9]	1.2	[0.7–2.1]	84.5	[81.7–86.9]	1.3	[0.6–2.8]	1 355
35–44	9.9	[7.8–12.3]	2.3	[1.5–3.4]	1.5	[0.8–2.8]	85.1	[82.2–87.6]	1.2	[0.6–2.5]	1 287
45–54	6.4	[4.7–8.7]	1.8	[1.1–3.0]	1.8	[1.0–3.2]	88.7	[85.8–91.1]	1.2	[0.6–2.6]	1 275
55–64	7.6	[5.5–10.4]	3.1	[1.9–5.0]	1.8	[1.0–3.0]	86.0	[82.4–89.0]	1.5	[0.9–2.7]	990
65+	11.7	[6.7–19.5]	3.7	[1.6–8.3]	1.7	[0.9–3.2]	81.5	[74.0–87.3]	1.4	[0.7–2.5]	784
Locality											
Urban formal	10.1	[8.5–12.0]	2.6	[1.9–3.6]	1.4	[1.0–2.0]	84.7	[82.5–86.7]	1.1	[0.7–1.8]	4 256
Urban informal	11.1	[8.7–14.0]	3.7	[2.4–5.8]	1.8	[0.9–3.4]	81.9	[78.1–85.1]	1.5	[0.7–3.2]	816
Rural formal	7.9	[4.8–12.7]	2.9	[1.4–6.0]	1.2	[0.5–3.1]	86.7	[81.2–90.9]	1.3	[0.5–3.1]	806
Rural informal	6.6	[5.2–8.3]	1.8	[1.3–2.7]	1.2	[0.7–2.1]	88.5	[86.6–90.2]	1.8	[1.2–2.8]	1 486
Province											
Western Cape	9.1	[6.8–12.2]	2.6	[1.5–4.5]	0.7	[0.4–1.2]	86.7	[83.0–89.6]	0.9	[0.4–1.9]	1 414
Eastern Cape	6.9	[4.8–9.9]	2.5	[1.3–4.9]	1.1	[0.4–2.6]	88.6	[84.5–91.7]	1.0	[0.5–1.9]	796
Northern Cape	9.4	[5.7–15.1]	2.6	[1.3–5.3]	0.3	[0.1–1.4]	87.2	[80.4–91.9]	0.4	[0.1–1.3]	614
Free State	10.9	[8.3–14.0]	2.5	[1.4–4.4]	3.4	[1.8–6.1]	81.5	[77.9–84.7]	1.8	[0.8–3.8]	412
KwaZulu–Natal	7.6	[5.0–11.4]	2.7	[1.9–3.9]	2.1	[1.4–3.2]	86.1	[82.6–89.0]	1.5	[0.8–2.9]	1 500
North West	13.9	[10.1–18.8]	4.3	[2.4–7.5]	3.6	[2.1–6.3]	76.1	[69.2–81.9]	2.1	[1.0–4.2]	597
Gauteng	9.4	[7.1–12.2]	2.1	[1.0–4.3]	0.7	[0.3–1.7]	86.6	[82.8–89.6]	1.2	[0.5–2.9]	917
Mpumalanga	10.7	[7.1–15.9]	3.3	[1.8–5.9]	1.4	[0.6–3.2]	81.5	[76.1–86.0]	3.1	[1.4–6.5]	524
Limpopo	9.8	[6.8–13.9]	1.9	[1.1–3.2]	0.8	[0.2–3.7]	86.3	[82.0–89.7]	1.3	[0.6–2.5]	590
Race											
African	9.0	[7.8–10.2]	2.6	[2.0–3.4]	1.5	[1.1–2.0]	85.3	[83.6–86.8]	1.7	[1.2–2.3]	4 390
White	11.8	[7.1–19.1]	2.7	[1.3–5.5]	1.0	[0.4–2.5]	84.1	[76.5–89.5]	0.4	[0.1–1.8]	370
Coloured	8.2	[6.5–10.3]	1.7	[1.2–2.5]	0.9	[0.6–1.4]	88.4	[86.0–90.5]	0.7	[0.3–1.8]	1 846
Asian/Indian	6.8	[4.5–10.3]	3.7	[2.5–5.5]	2.6	[1.1–5.9]	86.8	[83.1–89.8]	0.0	[0.0–0.3]	741
Total	9.1	[8.0–10.4]	2.6	[2.1–3.2]	1.4	[1.1–1.8]	85.6	[84.1–86.9]	1.3	[1.0–1.8]	7 347

95% CI: 95% confidence interval

Table 3.10.2.1.1: Type of facility from which inpatient care was last received among all participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	Public hospital		Private		Other		Total
	%	95% CI	%	95% CI	%	95% CI	n
Sex							
Male	68.3	[59.6–75.9]	29.4	[22.0–38.1]	2.3	[0.9–5.8]	319
Female	72.4	[65.8–78.1]	26.9	[21.2–33.4]	0.7	[0.3–2.1]	654
Age							
15–24	78.3	[68.2–85.9]	20.4	[13.0–30.6]	1.2	[0.3–4.4]	223
25–34	75.3	[63.7–84.2]	23.7	[15.0–35.4]	1.0	[0.1–6.5]	188
35–44	64.4	[53.5–74.0]	34.7	[25.3–45.3]	0.9	[0.1–6.2]	187
45–54	64.3	[51.9–75.1]	32.9	[22.6–45.2]	2.7	[0.7–9.7]	144
55–64	59.5	[45.2–72.3]	40.0	[27.2–54.2]	0.6	[0.1–3.9]	123
65+	76.5	[58.2–88.4]	21.9	[10.5–40.2]	1.6	[0.2–10.8]	108
Locality							
Urban formal	63.0	[54.8–70.4]	35.7	[28.3–43.8]	1.4	[0.6–3.3]	587
Urban informal	89.4	[81.8–94.0]	9.6	[5.5–16.4]	1.0	[0.2–6.3]	141
Rural formal	*	*	*	*	*	*	82
Rural informal	89.0	[81.6–93.6]	9.6	[5.1–17.2]	1.4	[0.4–4.8]	163
Province							
Western Cape	59.5	[41.7–75.1]	40.5	[24.9–58.3]	*	*	167
Eastern Cape	*	*	*	*	*	*	89
Northern Cape	*	*	*	*	*	*	77
Free State	*	*	*	*	*	*	73
KwaZulu–Natal	73.6	[58.7–84.5]	25.7	[14.9–40.7]	0.7	[0.1–3.6]	195
North West	*	*	*	*	*	*	99
Gauteng	77.8	[66.9–85.9]	22.2	[14.1–33.1]	*	*	117
Mpumalanga	*	*	*	*	*	*	77
Limpopo	*	*	*	*	*	*	79
Race							
African	79.5	[73.9–84.2]	19.0	[14.5–24.6]	1.5	[0.7–3.1]	604
White	*	*	*	*	*	*	62
Coloured	70.1	[57.8–80.1]	29.9	[19.9–42.2]			209
Asian/Indian	*	*	*	*	*	*	95
Total	71.0	[65.4–76.1]	27.7	[22.7–33.4]	1.3	[0.6–2.5]	970

95% CI: 95% confidence interval

** Too few observations to record reliably*

3.10.2.2 Reason inpatient care last needed

Among the respondents who received inpatient care, the reasons for care varied: acute conditions (17.1%), chronic conditions (20.1%) and a very small percentage for communicable diseases (3.6%) and the rest (59.2%) indicated other (Table 3.10.2.2.1). There were more males than females who needed inpatient care for acute condition (males 19.1%; females 16.1%), chronic conditions (males 24.6%; females 17.9%) and communicable conditions (males 4.8%; females 3%). However, there were more females (63%) than males (51.5%) who needed inpatient care due to conditions classified under other in Table 3.10.2.3.

Table 3.10.2.2.1: Reason(s) inpatient care was last needed among all participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	Reason(s) for inpatient care in the 12 months preceding the interview								
	Acute		Chronic		Communicable		Other		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex									
Male	19.1	[13.6–26.2]	24.6	[18.8–31.4]	4.8	[2.8–8.2]	51.5	[43.8–59.1]	310
Female	16.1	[12.5–20.5]	17.9	[13.8–22.9]	3.0	[1.9–4.8]	63.0	[57.1–68.5]	638
Age									
15–24	27.2	[19.8–36.2]	7.8	[4.2–14.1]	2.0	[0.8–4.7]	63.0	[53.4–71.6]	212
25–34	14.1	[8.6–22.2]	7.6	[4.1–13.7]	2.4	[1.0–5.7]	75.9	[66.9–83.1]	187
35–44	13.3	[8.3–20.7]	28.5	[19.8–39.1]	3.6	[1.7–7.7]	54.6	[44.0–64.7]	183
45–54	19.4	[11.0–32.0]	30.0	[20.7–41.3]	7.6	[3.6–15.5]	43.0	[31.7–55.1]	141
55–64	17.2	[9.0–30.3]	34.3	[24.1–46.1]	4.4	[1.6–11.7]	44.1	[33.0–55.8]	116
65+	9.1	[3.8–20.2]	32.9	[17.3–53.5]	4.3	[1.3–12.9]	53.7	[32.3–73.8]	109
Locality									
Urban formal	18.5	[14.1–24.0]	19.9	[15.7–24.8]	2.5	[1.4–4.3]	59.1	[52.9–65.1]	570
Urban informal	13.2	[8.2–20.6]	20.9	[14.7–28.7]	5.4	[2.0–13.5]	60.5	[51.9–68.6]	138
Rural formal	*	*	*	*	*	*	*	*	83
Rural informal	15.4	[9.8–23.2]	17.2	[11.9–24.1]	6.7	[3.7–11.9]	60.8	[51.7–69.2]	157
Province									
Western Cape	8.2	[4.0–16.0]	16.6	[11.0–24.2]	3.7	[1.2–10.7]	71.5	[61.4–79.8]	162
Eastern Cape	*	*	*	*	*	*	*	*	87
Northern Cape	*	*	*	*	*	*	*	*	72
Free State	*	*	*	*	*	*	*	*	72
KwaZulu-Natal	14.0	[7.9–23.7]	22.7	[15.5–32.0]	1.2	[0.2–8.3]	62.1	[50.1–72.8]	193
North West	*	*	*	*	*	*	*	*	97
Gauteng	26.5	[18.0–37.0]	15.2	[9.2–24.1]	1.0	[0.2–6.5]	57.3	[47.5–66.6]	114
Mpumalanga	*	*	*	*	*	*	*	*	74
Limpopo	*	*	*	*	*	*	*	*	77
Race									
African	18.3	[14.7–22.6]	19.0	[15.8–22.8]	4.5	[3.0–6.6]	58.2	[53.6–62.6]	587
White	*	*	*	*	*	*	*	*	61
coloured	13.8	[7.8–23.2]	23.7	[16.8–32.2]	2.9	[1.4–6.1]	59.7	[50.8–68.0]	203
Asian/Indian	*	*	*	*	*	*	*	*	94
Total	17.1	[13.8–20.9]	20.1	[16.7–24.0]	3.6	[2.5–5.2]	59.2	[54.6–63.6]	948

95% CI: 95% confidence interval

** Too few observations to record reliably*

The reason for inpatient care for young people aged 15–34 years were mainly acute conditions and other. Adults 35 years and above primarily needed inpatient care for chronic conditions followed by acute conditions. There were no significant differences in the reasons for seeking inpatient care between rural and urban areas for acute, chronic, communicable and other conditions or diseases. There was also no significant difference in the reasons for inpatient care among the different race groups for all disease categories, acute, chronic, communicable and other. A comparison of acute and chronic conditions as reasons for last needed care indicates that respondents from the Eastern Cape, Gauteng and Mpumalanga primarily reported acute condition (more than 20%) as the reason for inpatient care while respondents from the North West, Northern Cape, Limpopo, KwaZulu-Natal and Free State primarily reported chronic conditions (more than 20%) as reasons for inpatient care.

3.10.2.3 Source of payment for last inpatient visit

Table 3.10.2.3.1 shows results for source of payment for the last inpatient visit in a health care facility among participants aged 15 years and older stratified by sex, age, locality, province and race. Payments for the last inpatient health care for participants over the last 12 months were contributions from the medical aid (25.3%), followed by out of pocket (17.9% total, 11.4% – respondent and 6.5% – family member) and other (11.3%) while the rest were free of charge (47.5%).

There is a difference that was observed in the use of medical aid to pay for inpatient care in the different provinces. Western Cape, Free State and Northern Cape residents were more likely to pay for inpatient services using medical aid, which was less so for the rest of the provinces, particularly North West, Limpopo and Gauteng (Figure 3.10.2.3.1 and Table 3.10.2.3.1). Residents of North West, Gauteng and Limpopo were more likely than all the other provinces to obtain free health care services. Residents of KwaZulu-Natal were more likely than other groups to pay for out-of-pocket expenses (12.3% self-payment, and 14.9% by family, for a total of 27.2%). Because individuals are likely to use more than one source to pay for health services, it is not possible to compute confidence intervals or other statistical tests to assess the significance of the differences.

More males (26.6%) than females (23.9%) paid for inpatient care through medical aid and more females (50.3%) than males (39.4%) received free inpatient care. Medical aid as a source of payment for inpatient care was mainly used by residents in urban formal areas (33.1%) while urban informal residents (65.9%) used free-of-charge health care. There was no differences in the use of free inpatient care over the last 12 months between rural formal (57.9%) and rural informal (54.7%) areas. However, rural informal residents were more likely to pay for inpatient services out of pocket than their counterparts.

Figure 3.10.2.3.1.: Source of payment for the last inpatient visit to a health care facility among all participants aged 15 years and older by province, South Africa 2012

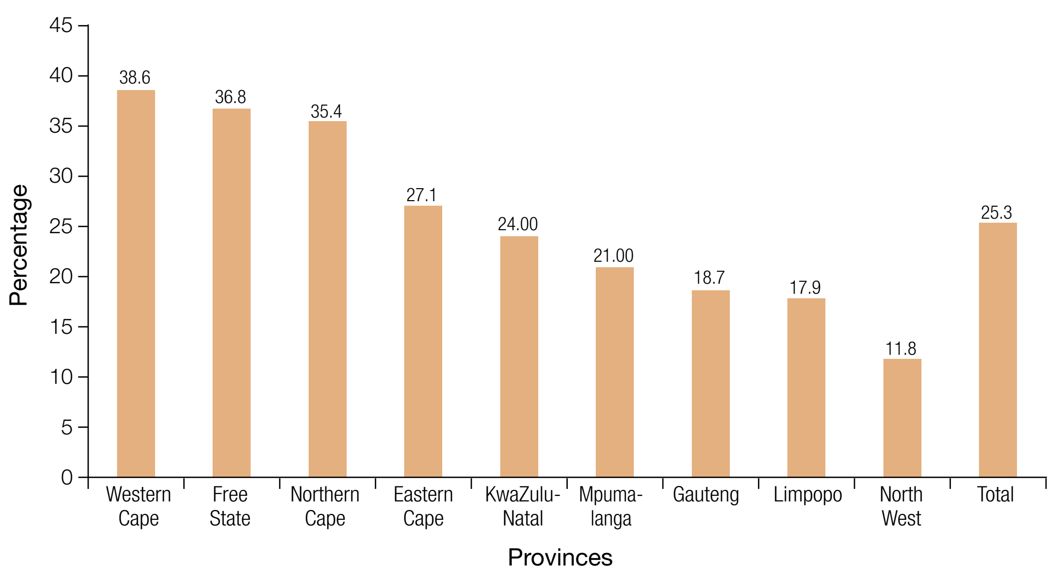


Table 3.10.2.3.1: Source of payment for the last inpatient visit to a health care facility among all participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	Payment of inpatient visits over the last 12 months					
	Medical aid	Respondent	Spouse/ partner/ child	Other	Free of charge	Total
	%	%	%	%	%	n
Sex						
Males	26.6	16.6	1.6	15.8	39.4	311
Females	23.9	8.4	8.8	8.6	50.3	651
Total	25.3	11.4	6.5	11.3	47.5	962
Age						
15–24	16.6	7.4	3.3	13.5	59.1	216
25–34	15.6	10.8	5.8	16.4	51.3	184
35–44	31.9	14.3	4.7	8.5	40.6	188
45–54	37.0	15.1	3.1	4.3	40.4	142
55–64	37.1	17.5	2.1	7.6	35.7	123
65+	23.9	3.7	23.1	9.6	39.7	109
Total	25.3	11.4	6.5	11.3	47.5	962
Locality						
Urban formal	33.1	10	7.2	9.9	39.7	581
Urban informal	4.6	11.5	5.3	12.7	65.9	138
Rural formal	*	*	*	*	*	84
Rural informal	6.3	16.5	5.5	16.9	54.7	159
Total	25.3	11.4	6.5	11.3	47.5	962
Province						
Western Cape	38.6	19.6	1.6	5.3	34.8	166
Eastern Cape	*	*	*	*	*	89
Northern Cape	*	*	*	*	*	76
Free State	*	*	*	*	*	72
KwaZulu-Natal	24.0	12.3	14.9	9.7	39.2	193
North West	*	*	*	*	*	98
Gauteng	18.5	2.9	6.4	14.9	57.3	117
Mpumalanga	*	*	*	*	*	76
Limpopo	*	*	*	*	*	75
Total	25.3	11.4	6.5	11.3	47.5	962
Race						
African	15.5	10.8	4.7	14	55	595
White	*	*	*	*	*	62
Coloured	28.7	11.8	6.7	7	45.8	207
Asian/Indian	*	*	*	*	*	95
Total	25.3	11.4	6.5	11.3	47.5	962

95% CI: 95% confidence interval

** Too few observations to record reliably*

3.10.2.4 Overall satisfaction of inpatient care at the last visit

The majority (85.5%) of the participants were very satisfied or satisfied with the inpatient care received at the last hospital visit. There were more male than female participants who were very satisfied or satisfied (87.5% compared to 84.4%) (Table 3.10.2.4.1). All provinces registered more than 80% satisfaction with Western Cape reporting the highest (91%) and Limpopo the lowest (81%) inpatient satisfaction at the last hospital visit. There were no significant differences among the different age groups in relation to their satisfaction with the inpatient care received in their last hospital. However, respondents aged 45–54 years reported the highest level of satisfaction (89.5%) and the lowest (82.8%) was reported by those aged 15–24 years. Analysis of the overall satisfaction according to race indicates that Indian respondents (96.4%) were more satisfied with inpatient care at the last visit than the other groups with black Africans being the lowest (83.4%) amongst all the groups. There was no significant difference in satisfaction amongst the different locations. However, there were more rural formal residents (95.5%) who were satisfied with inpatient care at last visit than residents from other localities.

3.10.3 Utilisation patterns of outpatient care

In order to assess the proportion of the population using outpatient health services, respondents were asked whether in the last 12 months they had received care at a hospital, health centre, clinic, private office or at home from a health care worker, but did not stay in hospital overnight. Proportions of the population that accessed outpatient care compared to those who did not by sex, age, locality, province and race are presented below.

Slightly more than 38% of participants aged 15 years and older received outpatient care, which may have been received at a hospital outpatient department, health centre, clinic, private offices or at home. Use of services did not differ significantly by sex, but differences were found when analysed by age. As expected age is positively associated with use of services; in this case it was positively associated with outpatient care use. Younger South Africans (15–24 years) had significantly lower rates of use of outpatient services than the 65 and above age group (33.0% and 45.6% respectively). Although there were variations in use of outpatient services by locality type, with rural formal residents more likely than all their counterparts to use such services, the differences were not statistically significant (results not shown). Examining outpatient use of health care by province showed that Northern Cape (64.1%) and Eastern Cape (54.1%) residents were more likely than the remainder of the provinces to use outpatient health services (with the exception of North West and Limpopo, which were significantly higher than only some of the other provinces). The Indian population (26.6%) was less likely than all the other race groups to use outpatients' services in the last 12 months.

Table 3.10.2.4.1: Overall satisfaction with inpatient care at the last hospital visit among all participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	Overall satisfaction of inpatient care at the last visit										
	Very satisfied		Satisfied		Neither satisfied nor dissatisfied		Dissatisfied		Very dissatisfied		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex											
Male	40.7	[32.7–49.3]	46.8	[38.0–55.8]	7.3	[3.6–14.5]	4.8	[2.1–10.7]	0.3	[0.1–1.6]	294
Female	42.9	[35.9–50.2]	41.5	[35.3–47.9]	9.2	[5.9–14.1]	3.2	[1.9–5.4]	3.2	[1.4–6.9]	617
Age											
15–24	31.7	[22.9–42.1]	51.1	[40.9–61.2]	7.9	[4.0–15.0]	4.1	[1.8–9.2]	5.1	[1.8–13.4]	203
25–34	39.6	[30.6–49.5]	45.2	[34.8–55.9]	11.4	[6.2–20.2]	3.8	[1.5–9.0]	*	*	176
35–44	44.8	[34.8–55.3]	39.8	[30.1–50.4]	7.9	[3.0–19.1]	3.2	[1.2–8.3]	4.3	[1.5–11.9]	173
45–54	47.9	[34.9–61.1]	41.6	[29.4–54.9]	8.6	[2.5–25.7]	1.1	[0.4–3.1]	0.9	[0.2–4.4]	136
55–64	45.5	[33.3–58.2]	41.9	[30.5–54.2]	9.3	[3.7–21.3]	1.9	[0.5–6.6]	1.5	[0.3–5.9]	119
65+	52.6	[33.8–70.6]	34.5	[19.9–52.6]	4.7	[1.9–10.8]	8.3	[2.6–23.5]	*	*	104
Locality											
Urban formal	45.9	[38.6–53.3]	38.1	[31.3–45.5]	10.2	[6.4–16.1]	3.3	[1.7–6.4]	2.4	[0.8–7.0]	543
Urban informal	27.2	[19.0–37.3]	59.7	[48.3–70.1]	7.4	[3.3–15.7]	2.9	[0.9–9.5]	2.8	[0.6–11.6]	132
Rural formal	*	*	*	*	*	*	*	*	*	*	82
Rural informal	34.8	[25.9–44.9]	51.1	[40.3–61.7]	6.6	[3.5–12.0]	6.3	[3.0–12.6]	1.2	[0.4–3.8]	154
Province											
Western Cape	50.8	[42.0–59.6]	40.2	[30.5–50.7]	6.7	[1.9–20.5]	1.8	[0.6–5.2]	0.6	[0.1–2.5]	159
Eastern Cape	*	*	*	*	*	*	*	*	*	*	88
Northern Cape	*	*	*	*	*	*	*	*	*	*	70
Free State	*	*	*	*	*	*	*	*	*	*	70
KwaZulu-Natal	48.6	[33.4–64.1]	38.6	[25.4–53.8]	11.2	[5.2–22.4]	1.5	[0.4–5.6]	*	*	185
North West	*	*	*	*	*	*	*	*	*	*	88
Gauteng	32.6	[21.9–45.4]	43.9	[30.8–57.9]	13.0	[5.9–26.2]	3.5	[0.9–13.1]	7.0	[2.4–18.4]	109
Mpumalanga	*	*	*	*	*	*	*	*	*	*	72
Limpopo	*	*	*	*	*	*	*	*	*	*	70
Race											
African	34.0	[28.5–40.0]	49.4	[42.9–55.9]	9.6	[6.4–14.0]	4.2	[2.5–7.1]	2.8	[1.2–6.5]	567
White	*	*	*	*	*	*	*	*	*	*	58
Coloured	48.8	[37.6–60.2]	39.1	[29.3–49.8]	7.0	[2.4–18.4]	3.4	[1.5–7.7]	1.7	[0.5–5.5]	198
Asian/Indian	*	*	*	*	*	*	*	*	*	*	86
Total	42.2	[36.9–47.6]	43.3	[37.9–48.8]	8.6	[5.9–12.4]	3.8	[2.4–5.9]	2.2	[1.0–4.8]	911

95% CI: 95% confidence interval

Table 3.10.3.1: Outpatient care utilisation in the past 12 months among all participants aged 15 and older by sex, age, province, and race, South Africa 2012

Background characteristics	Yes		No		Total
	%	95% CI	%	95% CI	n
Sex					
Male	35.5	[32.1–39.1]	64.5	[60.9–67.9]	2 707
Female	40.1	[36.8–43.5]	59.9	[56.5–63.2]	4 584
Age					
15–24	33.0	[28.8–37.5]	67.0	[62.5–71.2]	1 653
25–34	38.7	[34.2–43.5]	61.3	[56.5–65.8]	1 338
35–44	37.8	[33.4–42.4]	62.2	[57.6–66.6]	1 274
45–54	38.0	[33.5–42.7]	62.0	[57.3–66.5]	1 264
55–64	42.8	[34.7–51.3]	57.2	[48.7–65.3]	983
65+	45.6	[37.9–53.4]	54.4	[46.6–62.1]	777
Province					
Western Cape	37.0	[30.0–44.5]	63.0	[55.5–70.0]	1 393
Eastern Cape	54.1	[47.1–60.9]	45.9	[39.1–52.9]	793
Northern Cape	64.1	[56.5–71.0]	35.9	[29.0–43.5]	613
Free State	21.6	[16.2–28.1]	78.4	[71.9–83.8]	410
KwaZulu-Natal	32.7	[25.2–41.3]	67.3	[58.7–74.8]	1 483
North West	50.0	[40.9–59.0]	50.0	[41.0–59.1]	595
Gauteng	34.3	[28.7–40.5]	65.7	[59.5–71.3]	906
Mpumalanga	31.1	[22.8–40.7]	68.9	[59.3–77.2]	517
Limpopo	41.5	[32.7–50.8]	58.5	[49.2–67.3]	582
Race					
African	37.1	[33.9–40.5]	62.9	[59.5–66.1]	4 348
White	40.8	[31.2–51.2]	59.2	[48.8–68.8]	368
Coloured	45.1	[39.0–51.3]	54.9	[48.7–61.0]	1 826
Asian/Indian	26.6	[22.2–31.7]	73.4	[68.3–77.8]	734
Total	38.2	[35.3–41.1]	61.8	[58.9–64.7]	7 276

95% CI: 95% confidence interval

3.10.3.1 Frequency of outpatient care in the 12 months

The results show that 40% of the population 15 years and older received outpatient care once in the last 12 months (Table 3.10.3.1.1). Males were significantly more likely than females to have received outpatient care only once within the past year. As anticipated, young people aged 15–24 years were more likely to use outpatient health services only once a year compared to the 65 years or older age group. The older population (55–64, and 65 years and older) were not significantly less likely than all other age groups to use the outpatient services once; often using it more than once. There were no differences by locality (results not shown). However, there were provincial differences, with Free State residents (50.9%) more likely to use outpatient services once in a year compared to Mpumalanga (24.5%) and North West (30%). There were no significant differences by race. Indian respondents reported the least outpatient care in the past 12 months as compared to the other race groups, though this was not statistically significant. However, visits to outpatients four or more times in the past 12 months were high among the Indian respondents.

Table 3.10.3.1.1: Frequency of outpatient care in the 12 months preceding the interview among all participants aged 15 years and older by sex, age, province and race, South Africa 2012

Background characteristics	Frequency of outpatient care in the preceding 12 month: males and females										
	Once		2–3 times		4 or more		None		Don't know		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex											
Male	46.6	[40.7–52.5]	21.3	[17.6–25.5]	19.5	[15.9–23.5]	9.8	[7.2–13.3]	2.9	[1.7–4.8]	1 016
Female	35.8	[32.0–39.6]	26.8	[23.4–30.5]	24.6	[21.6–27.8]	8.2	[6.1–10.9]	4.7	[3.3–6.6]	1 889
Age											
15–24	46.1	[40.4–51.9]	23.6	[18.7–29.3]	14.6	[11.4–18.5]	11.9	[8.2–17.0]	3.9	[2.2–6.6]	571
25–34	45.7	[39.1–52.5]	24.3	[19.6–29.7]	16.6	[12.7–21.5]	9.8	[6.5–14.5]	3.5	[1.6–7.4]	518
35–44	40.8	[34.0–48.0]	24.4	[19.5–30.1]	24.6	[19.1–31.0]	4.9	[3.1–7.5]	5.3	[3.0–9.3]	495
45–54	38.3	[31.2–45.9]	22.5	[18.2–27.5]	26.1	[20.8–32.2]	9.7	[6.2–14.7]	3.5	[1.9–6.3]	521
55–64	32.8	[26.1–40.3]	26.9	[19.9–35.1]	28.0	[19.6–38.4]	8.5	[5.0–13.9]	3.8	[2.1–6.9]	418
65+	25.6	[20.5–31.5]	28.1	[22.0–35.1]	35.8	[29.4–42.7]	7.1	[3.5–13.9]	3.4	[1.8–6.2]	381
Province											
Western Cape	39.5	[34.2–45.2]	29.4	[24.8–34.6]	18.9	[13.9–25.2]	10.7	[6.6–17.0]	1.4	[0.6–3.1]	584
Eastern Cape	40.0	[32.5–48.0]	22.4	[18.0–27.5]	23.4	[18.3–29.5]	5.2	[2.6–9.9]	9.0	[5.1–15.4]	429
Northern Cape	41.2	[31.4–51.8]	24.9	[17.3–34.5]	31.8	[23.3–41.8]	0.7	[0.2–2.4]	1.3	[0.4–4.0]	399
Free State	50.9	[39.0–62.7]	21.5	[13.9–31.7]	11.3	[4.8–24.3]	11.4	[5.7–21.5]	4.9	[1.2–17.4]	101
KwaZulu-Natal	37.3	[27.6–48.1]	28.7	[22.6–35.7]	23.0	[15.3–33.1]	8.7	[4.6–15.9]	2.3	[1.0–5.0]	410
North West	30.0	[23.4–37.5]	33.3	[24.3–43.8]	31.2	[25.5–37.5]	2.6	[1.0–6.6]	2.9	[1.3–6.4]	280
Gauteng	49.7	[41.1–58.3]	20.6	[15.4–26.9]	20.4	[14.5–27.9]	5.3	[2.8–10.1]	4.0	[1.8–9.0]	307
Mpumalanga	24.5	[15.5–36.5]	17.4	[10.1–28.3]	31.8	[23.3–41.7]	24.4	[11.6–44.0]	1.9	[0.6–5.9]	154
Limpopo	34.3	[24.6–45.6]	18.6	[13.8–24.6]	21.3	[13.8–31.3]	20.9	[11.5–35.0]	4.9	[2.2–10.2]	241
Race											
African	40.1	[35.6–44.7]	22.9	[20.2–25.9]	23.3	[20.3–26.7]	8.5	[6.3–11.5]	5.2	[3.7–7.2]	1 648
White	39.6	[30.0–50.1]	31.6	[23.2–41.4]	18.2	[10.8–29.0]	10.6	[5.3–20.0]			147
Coloured	41.6	[37.2–46.2]	26.4	[22.4–30.7]	21.6	[17.4–26.4]	8.5	[5.3–13.5]	1.9	[1.0–3.7]	916
Asian/Indian	30.0	[22.1–39.3]	28.4	[16.7–43.9]	29.2	[16.6–46.1]	11.3	[5.2–22.6]	1.1	[0.3–3.6]	186
Total	40.0	[36.6–43.5]	24.6	[22.3–27.1]	22.6	[19.9–25.4]	8.8	[6.9–11.2]	4.0	[2.9–5.4]	2 897

95% CI: 95% confidence interval

3.10.3.2 *Type of facility outpatient care last received*

Those who did use outpatient care in the last 12 months were asked to specify what type of facility they accessed. Facilities were classified as public, private, or other. Results for type of facility from which outpatient care received are presented in Table 3.10.3.2.1, stratified by sex, age, locality, province and race.

Analysis of outpatient service utilisation shows that, among outpatient users of health care, most used public health facilities (62.7%), with few seeking care in private health facilities (35.4%) (Table 3.10.3.2.1). Further analysis by sex and age of respondent show no significant differences in the type of facility accessed (males 58.1%; females 65.6%) in the public sector. Urban formal residents are 2.7 times more likely than urban informal residents and 2.6 times more likely than rural informal residents to use the private sector for health care ($p < 0.05$). Western Cape residents (47%) reported the lowest rate of public health facility use for outpatient care compared to other provinces, however, only the differences between Western Cape and four other provinces (Eastern Cape, Limpopo, North West and Mpumalanga) were statistically significant ($p < 0.05$). Black Africans,

Table 3.10.3.2.1: Type of facility from which outpatient care was last received among all participants aged 15 years and older by locality, province and race, South Africa 2012

Background characteristics	Type of facility from which outpatient care was last received from by participant males and females						
	Public hospital/clinic		Private hosp/clinic/doc		Other		Total
	%	95% CI	%	95% CI	%	95% CI	n
Locality							
Urban formal	53.6	[46.0–61.1]	44.8	[37.6–52.1]	1.6	[0.7–3.8]	1 439
Urban informal	83.1	[76.5–88.1]	16.3	[11.3–22.8]	0.7	[0.2–2.6]	257
Rural formal	53.8	[43.2–64.1]	43.6	[33.9–53.7]	2.6	[1.1–5.9]	364
Rural informal	80.1	[76.0–83.6]	17.1	[13.5–21.4]	2.8	[1.4–5.4]	494
Province							
Western Cape	47.0	[39.3–54.9]	50.7	[42.6–58.7]	2.3	[1.2–4.3]	525
Eastern Cape	72.8	[65.8–78.9]	25.2	[19.0–32.7]	1.9	[0.7–5.5]	373
Northern Cape	58.8	[45.6–70.8]	40.8	[28.9–53.8]	0.4	[0.1–1.9]	386
Free State	*	*	*	*	*	*	87
KwaZulu–Natal	61.9	[42.1–78.4]	35.4	[20.4–53.8]	2.7	[0.6–10.9]	350
North West	75.2	[65.9–82.6]	19.9	[12.6–30.0]	4.9	[2.1–10.9]	264
Gauteng	58.5	[46.6–69.5]	40.7	[29.6–52.9]	0.7	[0.1–4.5]	269
Mpumalanga	69.8	[59.1–78.8]	26.4	[18.3–36.6]	3.7	[1.3–9.8]	116
Limpopo	73.8	[63.8–81.8]	25.6	[17.6–35.7]	0.6	[0.1–2.3]	184
Race							
African	71.8	[66.7–76.4]	25.9	[21.7–30.6]	2.3	[1.3–4.1]	1 413
White	17.4	[10.0–28.8]	82.6	[71.2–90.0]			130
Coloured	58.6	[52.0–64.9]	39.4	[33.1–45.9]	2.0	[1.1–3.8]	854
Asian/Indian	57.4	[33.2–78.4]	42.6	[21.6–66.8]			150
Total	62.7	[57.6–67.4]	35.4	[30.8–40.3]	1.9	[1.2–3.2]	2 547

95% CI: 95% confidence interval

coloureds and Indians used outpatient services in the public sector at a significantly higher rate than whites. Black Africans were 4.1 times more likely than whites to use outpatient services in the public sector. Coloureds and Indians were 3.3 times more likely than whites to use outpatient services in the public sector.

3.10.3.3 Reasons for seeking outpatient care at last visit

Participants were asked to provide information on the presenting health problems that had motivated a visit to the health care facility. The reasons for accessing health services were categorised as acute, chronic, communicable, and other (see section 3.10.1.4 for category specifications). Table 3.10.3.3.1 summarises the presenting problems at outpatient facilities for participants aged 15 years and older by sex, age, locality, province and race.

A third (32.4%) of respondents sought care for acute conditions, slightly less than a third (27%) for chronic conditions and a very small percentage for communicable diseases. The remainder sought care for other conditions (such as maternal and perinatal conditions, nutritional deficiencies, surgery and injury). The reasons for seeking care did not differ by sex of the respondent regardless of the presenting condition. The elderly (65 years and older) were significantly less likely than the rest of the age groups to seek care for acute conditions, instead they were more likely to seek care for chronic conditions. As expected there was a significant association of age and chronic conditions as presenting problems in outpatient facilities in the study population. Participants in urban areas were more likely to seek outpatient care for acute conditions than rural participants who were more likely to seek outpatient care for chronic condition.

Acute condition as the reason for needing outpatient care was indicated by more than a third of the participants who needed outpatient care in Eastern Cape (34.2%), KwaZulu-Natal (39.5%), Gauteng (40.4%) and Limpopo (35.7%). Northern Cape (34.2%) and North West (53.3%) participants indicated chronic conditions as their reason for needing outpatient care. More than a quarter of participants in Western Cape (41.6%), Eastern Cape (41.4%) and Limpopo (41%) and a quarter of participants from Northern Cape (36%), Free State (37.6%) and Mpumalanga (36.8%) indicated other conditions as their reason for seeking outpatient care. Amongst the different race groups more than a third of the black African (33.7%) and a quarter of whites (40.2%) participants' reason for indicated acute conditions as the reason for needing outpatient care with almost 50% of the Indians (49.6%) and 30.5% of the coloured population indicating chronic conditions as their reason for seeking outpatient care.

3.10.3.4 Source of payment for last outpatient visit

The study found that payments for the last outpatient health care for participants aged 15 years and older over the last 12 months were contributions from the medical aid (20.2%), followed by out of pocket (18.7%, that is, 15.2% self-paying and 3.5% paid by family), other (4.3%) and the rest were free of charge at the point of care (57.7%). Table 3.10.3.4.1 shows that there were more males (22.7%) than females (18.3%) who paid through the medical aid. More females (60%) than males (52.9%) received free outpatient care. Medical aid as a source of payment for outpatient care was mainly used by residents in urban formal areas (29.8%) while urban informal residents (70.5%) used health care for free. The urban informal and rural informal area residents had a miniscule proportion of the population paying for outpatient care through medical aid. There was no significantdifference in the use of free outpatient care over the last 12 months between the rural formal (56.9%) and rural informal (57.4%). There was however a significant difference in the use of medical aid to pay for outpatient care in the different provinces.

Table 3.10.3.3.1: Reason(s) for care that was needed the last time among all participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	Reason(s) for care the last time a doctor/hospital was needed								
	Acute		Chronic		Communicable		Other		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex									
Male	40.3	[37.4–43.2]	15.3	[13.4–17.4]	4.7	[3.6–6.1]	39.7	[36.5–43.1]	2 639
Female	37.1	[34.6–39.7]	19.9	[18.4–21.6]	2.4	[1.8–3.0]	40.6	[38.1–43.2]	4 452
Age									
15–24	45.4	[41.7–49.2]	5.0	[3.5–7.1]	1.9	[1.3–2.8]	47.7	[44.1–51.2]	1 616
25–34	40.5	[37.1–43.9]	8.2	[6.5–10.3]	4.6	[3.3–6.4]	46.7	[42.9–50.5]	1 303
35–44	42.0	[38.1–45.9]	13.7	[11.2–16.7]	5.0	[3.6–7.0]	39.3	[35.3–43.4]	1 241
45–54	32.8	[28.9–36.8]	29.7	[25.9–33.8]	3.6	[2.5–5.3]	33.9	[29.9–38.1]	1 232
55–64	32.4	[27.1–38.3]	33.1	[27.5–39.2]	2.3	[1.4–4.0]	32.1	[27.5–37.2]	943
65+	24.5	[19.3–30.6]	46.8	[40.1–53.5]	0.9	[0.3–2.3]	27.9	[21.4–35.4]	754
Locality									
Urban formal	40.6	[37.9–43.4]	17.9	[16.0–19.9]	2.8	[2.0–3.9]	38.7	[35.6–41.9]	4 089
Urban informal	38.9	[34.3–43.7]	15.0	[11.7–18.9]	3.4	[2.2–5.3]	42.7	[37.7–47.9]	783
Rural formal	33.9	[28.8–39.3]	21.7	[17.1–27.2]	3.0	[1.9–4.8]	41.4	[35.8–47.3]	777
Rural informal	34.5	[31.5–37.6]	18.3	[15.9–21.0]	4.6	[3.5–6.1]	42.6	[39.5–45.8]	1 443
Province									
Western Cape	35.2	[30.1–40.6]	17.3	[14.9–20.0]	2.1	[1.4–3.2]	45.4	[40.6–50.4]	1 364
Eastern Cape	37.8	[32.1–43.9]	16.1	[12.9–19.9]	3.5	[1.9–6.4]	42.6	[38.0–47.3]	774
Northern Cape	36.7	[30.6–43.3]	26.6	[22.5–31.3]	2.0	[0.7–5.2]	34.6	[29.5–40.2]	592
Free State	40.2	[34.4–46.4]	16.1	[12.8–20.0]	3.1	[1.4–6.8]	40.5	[33.3–48.3]	404
KwaZulu-Natal	38.8	[35.1–42.7]	16.0	[13.3–19.2]	3.6	[2.3–5.5]	41.6	[37.1–46.1]	1 433
North West	22.3	[17.5–28.0]	39.8	[34.2–45.8]	7.0	[4.6–10.4]	30.9	[26.3–35.9]	569
Gauteng	45.5	[41.7–49.3]	16.6	[13.5–20.2]	2.7	[1.5–5.0]	35.2	[29.9–41.0]	878
Mpumalanga	34.9	[28.9–41.4]	16.4	[12.2–21.6]	7.8	[5.6–10.7]	41.0	[35.2–47.0]	510
Limpopo	37.3	[32.3–42.6]	15.4	[11.6–20.2]	2.2	[1.2–4.0]	45.1	[39.4–50.9]	568
Race									
African	39.5	[37.4–41.6]	17.1	[15.7–18.7]	4.2	[3.4–5.1]	39.2	[36.8–41.7]	4 208
White	36.3	[28.5–44.9]	20.3	[14.8–27.2]	0.1	[0.0–0.8]	43.3	[35.6–51.4]	363
Coloured	34.2	[30.8–37.7]	20.0	[17.4–22.9]	2.1	[1.3–3.5]	43.7	[40.0–47.5]	1 805
Asian/Indian	38.4	[27.1–51.2]	21.7	[17.5–26.6]	0.4	[0.1–1.4]	39.5	[29.2–50.8]	699
Total	38.4	[36.5–40.3]	18.0	[16.7–19.4]	3.3	[2.7–4.0]	40.3	[38.2–42.4]	7 090

95% CI: 95% confidence interval

Gauteng, Western Cape and Free State compared to Eastern Cape, Mpumalanga, Limpopo and North West had a significantly higher proportion of the population paying for health services through medical aid (Figure 3.10.3.4.1). The low rate of medical aid use in the latter province implies that the public health care system has a larger proportion of the population to serve.

Figure 3.10.4.3.2 shows the size of the population aged 15 years and older accessing free services at the point of care in South African provinces. The results show that nearly 58% obtained free health are at outpatient health facilities. As expected, given the proportion paying with medical aid in Figure 3.10.4.3.1, North West province had the largest proportion of its population using public health services that are free at the point of care. However, Free State (41.3%) and Western Cape (47.8%) were the only two provinces where less than 50% of the participants reported using free outpatient health services. The rest ranged between 50.6% and 64.4%.

Figure 3.10.4.3.1: Percentage of the population paying for health care with medical aid by province, South Africa 2012

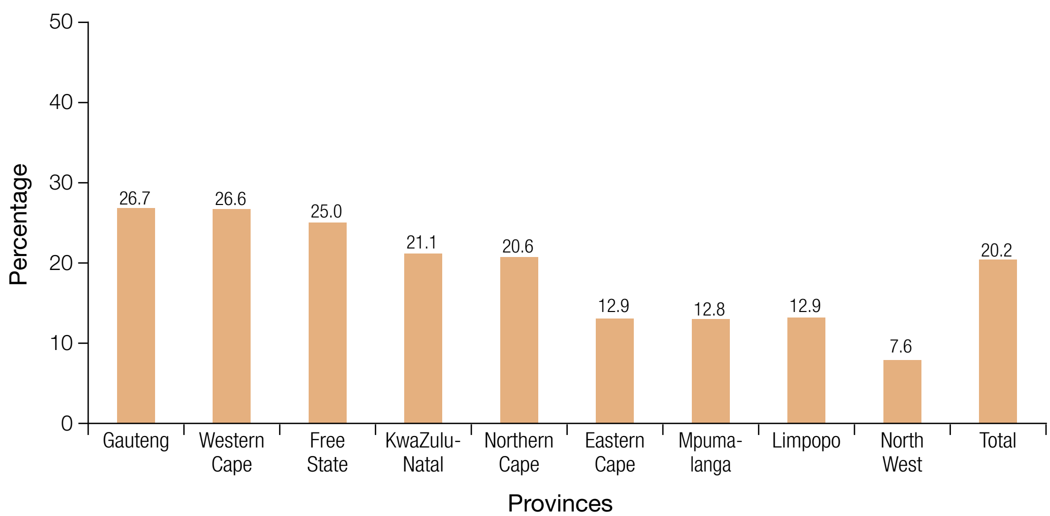
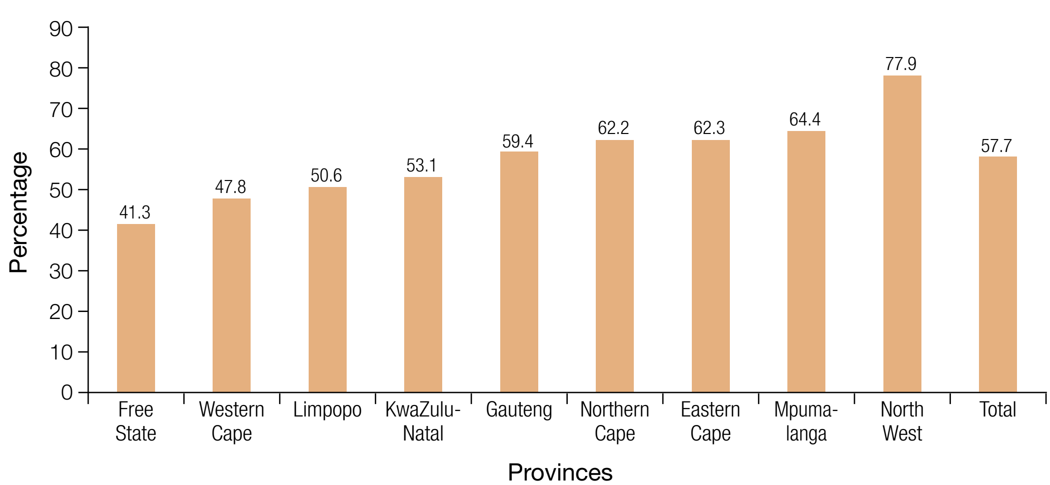


Figure 3.10.4.3.2: Percentage of the population aged 15 years and older accessing free outpatient services at the point of care by province, South Africa 2012



An analysis by race showed that black Africans (64.4%) and coloureds (60.0%) made up most users of the free outpatient health care (Table 3.10.3.4.1). Only 17.0% of whites indicated that they used free outpatient care.

Table 3.10.3.4.1: Source of payment for the last outpatient visits among all participants aged 15 years and older by sex, age and race, South Africa 2012

Background characteristics	Payment of outpatient visits over the last 12 months					
	Medical aid	Respondent	Spouse/ partner/child	Other	Free of charge	Total
	%	%	%	%	%	n
Sex						
Male	22.7	18.5	1.8	4.1	52.9	874
Female	18.3	12.9	4.5	4.4	60.0	1 639
Age						
15–24	16.6	8.1	1.0	11.5	62.7	489
25–34	18.0	20.6	3.4	3.1	54.9	451
35–44	16.3	18.0	4.8	2.1	58.8	429
45–54	27.0	15.3	4.7	2.3	50.8	448
55–64	32.6	15.3	2.1	2.9	47.1	357
65+	13.7	10.0	5.0	1.9	69.3	338
Race						
African	13.0	14.3	3.7	4.7	64.4	1 393
White	60.2	18.7	2.7	1.4	17.0	127
Coloured	16.8	16.8	2.3	4.0	60.0	837
Asian/Indian	27.5	7.8	8.0	9.5	47.2	149
Total	20.2	15.2	3.5	4.3	57.7	2 511

3.10.4 Satisfaction with health care services

The health care system is undergoing transformation to improve the quality of health service provision in public health facilities. It is therefore necessary to monitor satisfaction levels within the health care system to determine the impact of quality improvement initiatives. To measure satisfaction levels, respondents were asked how satisfied they were with the care received during their last inpatient visit and their last outpatient visit. Respondents were also asked how satisfied they were with the health provision and services in their area. To assess satisfaction, a five point Likert-type scale measurement was used.

Table 3.10.4.1 shows satisfaction levels with services provided at inpatient and outpatient facilities as well as how respondents perceived health provision and services in the area where the respondent lived.

The results show that the overwhelming majority (85.4% and 86%) of the participants were satisfied with inpatient and outpatient health care services needed, respectively (Table 3.10.4.1). However, in contrast to these findings, the participants were less satisfied with the way services were managed in their areas and were also less satisfied with how health care was provided. Furthermore, the participants were less satisfied with health services (71.3%) and health provision (69.3%) in their area.

Table 3.10.4.1: Level of satisfaction with the health care system

	Level of satisfaction with:											
	Inpatient health care services			Outpatient health care services			Health services in the area			Health provision in the area		
	%	95% CI	Total (n)	%	95% CI	Total (n)	%	95% CI	Total (n)	%	95% CI	Total (n)
Satisfied or very satisfied	85.4	[81.6–88.6]	794	86.0	[83.0–88.6]	2 141	71.3	[68.6–73.9]	10 704	69.3	[66.5–71.9]	10 265
Neither satisfied nor dissatisfied	8.6	[5.9–12.4]	61	7.1	[5.2–9.5]	139	13.9	[12.1–15.8]	1 991	16.3	[14.6–18.1]	2 420
Dissatisfied or very dissatisfied	6.0	[4.0–8.8]	56	6.9	[5.3–9.0]	198	14.8	[13.1–16.7]	2 280	14.5	[12.8–16.3]	2 199
Total	100.0		911	100.0		2 478	100.0		14 975	100,0		14 884

95% CI: 95% confidence interval

3.10.4.1 Satisfaction with public versus private inpatient health care services

In Table 3.10.4.1, satisfaction levels were combined for participants who used either the public or private sector. In Table 3.10.4.1.1, results are disaggregated for public and private facility inpatient users.

The results show that although public sector users were less satisfied (83.1%) than private sector users (92.1%), the differences were not statistically significant. Males compared to females appear to be slightly less satisfied with inpatient public health care; however, the differences are not statistically significant.

Table 3.10.4.1.1: Overall satisfaction with inpatient care at the last hospital visit among public and private facility users aged 15 years and older by sex, age, locality, province and race, South Africa 2012

Overall satisfaction with inpatient care at last hospital visit to private facility							
Sex	Satisfied or very satisfied		Neither		Dissatisfied or very dissatisfied		Total
	%	95% CI	%	95% CI	%	95% CI	n
Male	*	*	*	*	*	*	82
Female	93.6	[86.7–97.0]	4.0	[1.4–10.9]	2.4	[0.8–7.2]	150
Total	92.1	[83.6–96.3]	6.4	[2.5–15.4]	1.6	[0.5–4.7]	232
Overall satisfaction with inpatient care at last hospital visit to public facility							
Sex	Satisfied or very satisfied		Neither		Dissatisfied or very Dissatisfied		Total
	%	95% CI	%	95% CI	%	95% CI	n
Male	87.1	[78.9–92.4]	6.4	[3.2–12.5]	6.5	[2.7–14.9]	205
Female	81.2	[74.9–86.3]	10.9	[6.6–17.4]	7.9	[4.9–12.6]	455
Total	83.1	[78.3–87.0]	9.4	[6.3–14.0]	7.5	[4.9–11.2]	660

95% CI: 95% confidence interval

** Too few observations to record reliably*

3.10.4.2 *Satisfaction with inpatient health care services*

Satisfaction levels with inpatient hospital services are presented in Table 3.10.4.2.1 among adults aged 15 years and older who used services in the last 12 months. Satisfaction levels were high among those who received inpatient care in hospitals. The dissatisfaction levels were very low (6%) as were the levels of those who did not express an opinion. There were no significant sex differences in the level of satisfaction with inpatient care services received at hospitals. Although users of inpatient services were satisfied with the health services they received, persons aged 45–54 years were the most satisfied compared to all other groups, but differences were not statistically different.

Table 3.10.4.2.1: Overall satisfaction with inpatient care at the last hospital visit among all participants aged 15 years and older by sex, age, province and race, South Africa 2012

Background characteristics	Satisfied or very satisfied		Neither		Dissatisfied or very dissatisfied		Total
	%	95% CI	%	95% CI	%	95% CI	n
Sex							
Male	87.5	[80.0–92.5]	7.3	[3.6–14.5]	5.1	[2.3–11.0]	294
Female	84.4	[79.4–88.3]	9.2	[5.9–14.1]	6.4	[4.0–10.0]	617
Age							
15–24	82.8	[74.7–88.7]	7.9	[4.0–15.0]	9.3	[4.9–16.8]	203
25–34	84.8	[76.0–90.8]	11.4	[6.2–20.2]	3.8	[1.5–9.0]	176
35–44	84.6	[73.8–91.5]	7.9	[3.0–19.1]	7.5	[3.6–15.1]	173
45–54	89.5	[74.0–96.2]	8.6	[2.5–25.7]	2.0	[0.8–5.0]	136
55–64	87.3	[75.9–93.8]	9.3	[3.7–21.3]	3.4	[1.3–8.5]	119
65+	87.0	[72.0–94.6]	4.7	[1.9–10.8]	8.3	[2.6–23.5]	104
Province							
Western Cape	91.0	[79.0–96.4]	6.7	[1.9–20.5]	2.4	[0.9–5.8]	159
Eastern Cape	*	*	*	*	*	*	88
Northern Cape	*	*	*	*	*	*	70
Free State	*	*	*	*	*	*	70
KwaZulu-Natal	87.3	[76.2–93.6]	11.2	[5.2–22.4]	1.5	[0.4–5.6]	185
North West	*	*	*	*	*	*	88
Gauteng	76.5	[66.6–84.2]	13.0	[5.9–26.2]	10.5	[4.9–20.9]	109
Mpumalanga	*	*	*	*	*	*	72
Limpopo	*	*	*	*	*	*	70
Race							
African	83.4	[78.9–87.0]	9.6	[6.4–14.0]	7.1	[4.6–10.8]	567
White	*	*	*	*	*	*	58
Coloured	87.9	[77.9–93.7]	7.0	[2.4–18.4]	5.1	[2.6–9.9]	198
Asian/Indian	*	*	*	*	*	*	86
Total	85.4	[81.6–88.6]	8.6	[5.9–12.4]	6.0	[4.0–8.8]	909

95% CI: 95% confidence interval

** Too few observations to record reliably*

Further analysis of data by locality did not show any significant differences in satisfaction levels with inpatient hospital care. Comparisons by respondents' province of residence were not statistically significant despite considerable provincial variation.

Analysis of satisfaction level data by race show no significant differences in perception of care obtained in inpatient health care facilities between any races. However, figures for whites and Indians are based on small numbers of persons who received inpatient care and therefore care should be taken in interpreting these findings.

3.10.4.3 Satisfaction with outpatient care

Table 3.10.4.3.1 shows that overall satisfaction with outpatient care among participants was high at 86%. There was no significant difference in satisfaction among male and female participants, different age groups and between urban and rural participants. There was also no significant difference in satisfaction with outpatient care in the different provinces except for North West where only 63.1% were satisfied with outpatient care they received. Black Africans (83.2%) were statistically significantly less satisfied than whites (96.4%) with their experiences of outpatient care.

Table 3.10.4.3.1: Overall satisfaction with outpatient care at the last visit among all participants aged 15 years and older by province and race, South Africa 2012

Background characteristics	Overall satisfaction of outpatient care at the last visit						
	Satisfied or very satisfied		Neither		Dissatisfied or very dissatisfied		Total
	%	95% CI	%	95% CI	%	95% CI	n
Province							
Western Cape	92.4	[88.6–95.1]	2.4	[1.2–4.8]	5.2	[3.0–8.8]	516
Eastern Cape	89.7	[84.5–93.3]	3.0	[1.5–5.8]	7.3	[4.6–11.4]	361
Northern Cape	91.7	[85.1–95.5]	3.0	[1.4–6.2]	5.3	[2.5–10.7]	382
Free State	*	*	*	*	*	*	87
KwaZulu-Natal	93.7	[88.6–96.6]	3.0	[1.4–6.2]	3.3	[1.6–6.8]	338
North West	63.1	[54.4–71.0]	10.7	[7.0–16.0]	26.3	[17.6–37.2]	239
Gauteng	81.2	[70.2–88.8]	14.9	[8.8–24.3]	3.8	[1.0–13.4]	263
Mpumalanga	81.2	[72.5–87.7]	8.6	[4.0–17.6]	10.1	[4.9–19.9]	112
Limpopo	81.9	[71.9–88.9]	11.4	[6.2–20.1]	6.7	[3.4–12.5]	180
Race							
African	83.2	[79.5–86.4]	8.4	[6.2–11.4]	8.3	[6.2–11.2]	1 364
White	96.4	[91.6–98.5]	2.9	[1.2–7.3]	0.6	[0.1–2.8]	130
Coloured	88.7	[83.3–92.5]	5.2	[2.4–11.1]	6.1	[4.0–9.2]	833
Asian/Indian	94.2	[85.8–97.8]	1.2	[0.4–3.8]	4.6	[1.5–13.5]	144
Total	86.0	[83.0–88.6]	7.1	[5.2–9.5]	6.9	[5.3–9.0]	2 471

95% CI: 95% confidence interval

** Too few observations to record reliably*

3.10.4.4 Rating of the way health care was provided in the area of residence

Rating of satisfaction with the way health care was provided in the area of residence is also high, albeit lower than other measures of satisfaction, with 68.6% of respondents rating the way health care was provided as very good and good. Results did not vary significantly when analysed by sex, age and locality (Table 3.10.4.4.1). Analysis of

Table 3.10.4.4.1: Rating of the way health care was provided in the area of residence among all participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	Rating of the way health care was provided in the area of residence						
	Very good and good		Moderate		Bad and very bad		Total
	%	95% CI	%	95% CI	%	95% CI	n
Sex							
Male	67.6	[64.4–70.7]	18.0	[15.9–20.4]	14.4	[12.6–16.4]	6 129
Female	69.0	[66.2–71.7]	15.6	[13.9–17.4]	15.4	[13.5–17.4]	8 722
Total	68.4	[65.6–71.1]	16.6	[14.9–18.4]	15.0	[13.3–16.8]	14 851
Age							
15–24	67.2	[64.0–70.3]	17.9	[15.7–20.4]	14.8	[12.8–17.1]	4 166
25–34	67.2	[63.5–70.6]	17.3	[14.8–20.2]	15.5	[13.1–18.3]	2 908
35–44	69.2	[65.6–72.6]	16.0	[13.6–18.6]	14.8	[12.5–17.6]	2 450
45–54	71.0	[67.7–74.1]	14.6	[12.6–16.9]	14.4	[12.0–17.1]	2 234
55–64	68.8	[64.2–73.0]	16.3	[13.1–20.1]	14.9	[12.1–18.3]	1 715
65+	69.1	[64.3–73.5]	15.4	[12.7–18.5]	15.5	[12.4–19.1]	1 373
Total	68.4	[65.6–71.1]	16.6	[14.9–18.4]	15.0	[13.3–16.8]	14 846
Locality							
Urban formal	67.9	[63.2–72.3]	17.3	[14.5–20.4]	14.8	[12.3–17.7]	7 783
Urban informal	65.1	[58.3–71.3]	17.9	[14.3–22.3]	17.0	[11.9–23.6]	1 795
Rural formal	73.6	[68.0–78.5]	15.3	[11.4–20.2]	11.1	[8.2–14.8]	1 765
Rural informal	69.9	[65.9–73.6]	14.6	[12.6–16.9]	15.5	[12.4–19.2]	3 072
Total	68.6	[65.8–71.3]	16.4	[14.7–18.3]	14.9	[13.2–16.8]	14 415
Province							
Western Cape	75.3	[70.8–79.3]	13.1	[11.0–15.6]	11.6	[8.3–15.9]	2 141
Eastern Cape	67.5	[60.7–73.7]	17.1	[13.4–21.6]	15.4	[12.0–19.6]	1 621
Northern Cape	69.2	[60.4–76.9]	16.8	[13.1–21.3]	14.0	[9.3–20.5]	999
Free State	54.7	[46.5–62.7]	17.4	[13.1–22.9]	27.9	[21.2–35.7]	802
KwaZulu–Natal	75.2	[70.5–79.3]	13.3	[11.0–15.9]	11.6	[8.9–15.0]	2 480
North West	48.0	[41.3–54.7]	17.3	[13.5–21.9]	34.8	[27.5–42.8]	1 805
Gauteng	68.6	[60.8–75.4]	19.3	[14.8–24.7]	12.2	[8.8–16.6]	2 511
Mpumalanga	75.5	[67.4–82.1]	17.4	[11.8–25.1]	7.1	[5.2–9.5]	1 257
Limpopo	73.5	[70.3–76.3]	15.5	[12.7–18.7]	11.1	[9.0–13.6]	1 240
Total	68.4	[65.6–71.1]	16.6	[14.9–18.4]	15.0	[13.3–16.8]	14 856
Race							
African	67.1	[63.8–70.2]	17.2	[15.2–19.3]	15.8	[13.8–17.9]	9 792
White	84.2	[76.0–90.0]	8.0	[5.1–12.3]	7.8	[3.4–16.9]	683
Coloured	72.1	[67.6–76.2]	15.4	[13.0–18.0]	12.5	[9.2–16.9]	3 044
Asian/Indian	66.6	[55.1–76.4]	20.8	[16.8–25.4]	12.7	[6.4–23.7]	1 288
Total	68.4	[65.6–71.1]	16.6	[14.9–18.5]	15.0	[13.3–16.8]	14 849

95% CI: 95% confidence interval

the rating according to race shows that the majority (84.2%) of the white respondents compared to the Indian respondents (66.6%) rated the way health care was provided as very good and good. In analysis by province, North West reported the lowest rating (48.0%) of the health care provided in the area of residence compared to all other provinces with more than half to three quarters of respondents rating them very good and good. Differences between North West and all other provinces except Free State (54.7%) were statistically significant (< 0.05).

Satisfaction with outpatient care service provision, public v private

With the impending introduction of National Health Insurance, it is essential that the population using health services have a positive experience. Positive perceptions of health care provision indicate good quality health care. The results in Table 3.10.4.5 show the level of satisfaction with outpatient care received in the public and private sector facilities. Overall, 86% of participants were very satisfied or satisfied with outpatient care (public or private). The majority of those seen in the public sector were less satisfied overall; the satisfaction level with outpatient public care received was 80.1% compared with 96.1% for participants seen in the private health sector. The rate of very satisfied was much higher in the private sector than in the public sector (57.1% compared to 24.5%) (< 0.05). The overall level of dissatisfaction was 5.6% while 1.2% of participants were very dissatisfied.

Satisfaction with inpatient health care service provision, public compared to private

The results in Table 3.10.4.6 show the level of satisfaction with inpatient care received in the public and private sector facilities. Overall, 85.2% of participants were very satisfied or satisfied with outpatient care (public or private). The satisfaction level with inpatient public care received was 83.1% compared with 92.1% for participants seen in the private health sector. The rate of very satisfied was much higher in the private sector than in the public sector (69.5% compared to 32.7%); however the reported level of dissatisfaction was low, about 6%.

Satisfaction with waiting times

Long waiting times lead to poor health outcomes, health care utilisation and patient satisfaction. One of the priorities of the Department of Health is to ensure that patients are served in a timely manner resulting in a pleasant experience when using health services. Perceptions of waiting times before patients receive care were analysed, stratified by public or private sector facility. For outpatient care, 69.9% of participants thought waiting times were very good or good. The results in Table 3.10.4.7 show that the majority of those seen in the private sector had a very good experience with waiting times in outpatient facilities, meaning they received care promptly, whereas only a small percentage of public sector users had very good experiences (40.4% compared to 13.9%). Instead, those seen in public sector facilities had a good experience (47.3%). Differences in very good and good experiences between public and private facilities were significant ($p < 0.05$). Differences between experiences in the public and private sector were statistically insignificant for those who had moderate, bad or very bad experience. It is of note that the proportion of unsatisfactory experience with waiting times is more pronounced in the public sector where a total of 24.4% thought that the experience of waiting to be served was bad or very bad. In the private sector, this was a rare experience, with only 4.5% experiencing a serious delay in receiving care.

Table 3.10.4.5: Overall satisfaction with outpatient health care received among all participants aged 15 years and older, South Africa 2012

Type of health facility inpatient care	Very satisfied		Satisfied		Neither satisfied nor dissatisfied		Dissatisfied		Very dissatisfied		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Public hospital/clinic	24.5	[21.0–28.4]	55.6	[51.4–59.7]	9.5	[7.0–12.7]	8.6	[6.5–11.2]	1.8	[1.2–2.9]	1 638
Private hospital/clinic/doc	57.1	[50.9–63.2]	39.4	[33.7–45.4]	2.6	[1.4–4.7]	0.7	[0.3–1.6]	0.2	[0.0–0.8]	788
Other	*	*	*	*	*	*	*	*	*	*	34
Total	36.0	[32.3–39.9]	50.0	[46.5–53.5]	7.1	[5.2–9.5]	5.6	[4.3–7.4]	1.2	[0.8–1.9]	2 460

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.10.4.6: Overall satisfaction with inpatient care at the last visit among all participants aged 15 years and older by public compared to public sector, South Africa 2012

Type of health facility inpatient care	Very satisfied		Satisfied		Neither		Dissatisfied		Very dissatisfied		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Public hospital	32.7	[26.5–39.5]	50.4	[44.0–56.8]	9.4	[6.2–14.0]	4.6	[2.8–7.5]	2.9	[1.3–6.5]	660
Private	69.5	[61.0–76.8]	22.6	[16.6–30.0]	6.4	[2.5–15.4]	0.9	[0.2–3.5]	0.6	[0.1–4.2]	232
Other	*	*	*	*	*	*	*	*	*	*	6
Total	42.4	[37.0–47.9]	42.8	[37.4–48.3]	8.7	[6.0–12.6]	3.8	[2.4–6.0]	2.3	[1.0–4.9]	898

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.10.4.7: Waiting time before being attended to at outpatient health care facilities among all participants aged 15 years and older, South Africa 2012

Type of health facility outpatient care	Very good		Good		Moderate		Bad		Very bad		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Public hospital/clinic	13.9	[11.3–17.0]	45.6	[41.4–49.9]	16.1	[13.2–19.4]	16.5	[13.0–20.5]	7.9	[6.1–10.3]	1 666
Private hospital/clinic/doctor	40.4	[32.9–48.4]	47.3	[39.1–55.7]	7.8	[5.4–11.0]	3.5	[1.7–7.0]	1.0	[0.4–2.3]	801
Other	*	*	*	*	*	*	*	*	*	*	37
Total	23.3	[19.9–27.1]	46.6	[42.3–50.9]	13.1	[10.7–15.9]	11.6	[9.1–14.6]	5.4	[4.2–7.0]	2 504

95% CI: 95% confidence interval

** Too few observations to record reliably*

Among both public and private users, 78.4% of inpatients thought waiting times were very good or good (Table 3.10.4.8). For inpatient care, patients using private facilities again indicated a more positive experience with waiting times than patients using public facilities. More than half of private inpatients had a very good experience with waiting times, compared to fewer than a quarter of public inpatients (61.4% compared to 22.8%). Less than half of public sector inpatient users had a good experience (49.6%). Unfortunately, 6.0% of public sector inpatient users had a very bad experience with waiting times, compared to only 0.2% of private sector inpatient users. Differences were significant (at the 5% level) between public and private inpatient experiences for all categories except for those with 'bad' experiences.

Experience of being treated respectfully

The way in which patients assess the actions of health care providers and their usefulness can have far-reaching consequences for effective communication between the two parties, service use and satisfaction with services by patients. The quality of health care is influenced by the respect patients receive when coming into contact with health care workers. Patients are more likely to have a positive health care experience if they are treated with respect by health practitioners. Table 3.10.4.9 shows that overall 85.9% of outpatients thought their experience of being treated with respect was very good or good. Private sector users compared to public sector users had a greater proportion of very good experiences (46.8% compared to 17.7%) with being treated respectfully by health care providers when using outpatient health facilities ($p < 0.05$). About two thirds of the public sector outpatients had a good experience with the health sector (62.7%). In total, 95.5% of private sector patients compared with 80.4% of public sector patients experienced respectful treatment in health care facilities, suggesting that the overall majority of patients using outpatient facilities believed they were treated with respect.

In terms of respectful treatment at inpatient health care facilities, the results are similar with 88.6% of inpatients overall having had a very good or good experience of being treated respectfully in health care facilities (Table 3.10.4.10). Most private inpatients had very good experiences compared with a lower proportion of public inpatients (69.4% compared to 28.3%). More than half of inpatients served in public health facilities had a good experience (56.6%). These differences between public and private inpatient experiences were significant at the 5% level; differences between bad experiences were not statistically significant.

Clarity of explanations at outpatient health care facilities

Clear communication and information exchange between the patient and health care provider positively influences the adoption of health behaviours that are consistent with realising positive treatment outcomes. For example, utilisation of services for checkups, increased control over risky habits and helping their support structure cope with managing the disease. Furthermore, Bakker, Fitch, Gray et al. (2001) show that effective communication between patients and health providers is necessary for empowering patients with chronic diseases, such as breast cancer. Effective communication during patients' stay in hospital can empower patients and their families about the management of disease and available resources once patients are discharged from hospital.

A good health care system is one that ensures each patient is given a clear explanation of their presenting condition and the treatment options that are available or not available. The patient should leave the facility having a better understanding of the condition that caused the visit. Participants were asked how clearly health care providers explained

Table 3.10.4.8: Waiting time before being attended to at inpatient health care facilities among all participants aged 15 years and older, South Africa 2012

Type of facility	Very good		Good		Moderate		Bad		Very bad		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Public	22.8	[17.4–29.1]	49.6	[43.5–55.8]	14.2	[10.2–19.3]	7.4	[4.6–11.8]	6.0	[4.1–8.9]	687
Private	61.4	[53.1–69.0]	31.6	[24.4–39.8]	4.0	[1.8–8.3]	2.9	[1.1–7.2]	0.2	[0.0–1.1]	261
Other	*	*	*	*	*	*	*	*	*	*	5
Total	33.6	[28.8–38.9]	44.8	[39.8–49.9]	11.2	[8.2–15.0]	6.1	[3.9–9.2]	4.3	[2.9–6.4]	953

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.10.4.9: Experience of being treated respectfully at outpatient health care facilities among all participants aged 15 years and older, South Africa 2012

Type of health facility inpatient care	Very good		Good		Moderate		Bad		Very bad		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Public Hospital/clinic	17.7	[14.8–21.1]	62.7	[58.7–66.6]	13.2	[10.4–16.7]	4.7	[3.3–6.6]	1.7	[1.0–2.7]	1 670
Private hospital/clinic/doctor	46.8	[38.7–55.1]	48.7	[40.4–57.2]	3.9	[2.2–6.7]	0.4	[0.1–0.9]	0.2	[0.0–1.2]	800
Other	*	*	*	*	*	*	*	*	*	*	37
Total	28.0	[24.3–32.0]	57.9	[53.8–61.9]	9.9	[7.7–12.7]	3.1	[2.1–4.3]	1.1	[0.7–1.8]	2 507

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.10.4.10: Experience of being treated respectfully at inpatient health care facilities among all participants aged 15 years and older, South Africa 2012

Type of health facility inpatient care	Very good		Good		Moderate		Bad		Very bad		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Public hospital	28.3	[22.5–35.0]	56.6	[50.0–62.9]	10.5	[7.6–14.2]	2.6	[1.5–4.5]	2.0	[0.8–4.8]	686
Private	69.4	[61.0–76.7]	28.2	[21.0–36.6]	1.7	[0.7–4.3]	0.7	[0.1–3.4]	0.0	*	259
Other	*	*	*	*	*	*	*	*	*	*	7
Total	39.7	[34.1–45.5]	48.9	[43.3–54.5]	7.9	[5.9–10.6]	2.1	[1.2–3.4]	1.5	[0.6–3.5]	952

95% CI: 95% confidence interval

** Too few observations to record reliably*

conditions to patients who attended outpatient facilities. The results in Table 3.10.4.11 show the experience participants had in the public and private sector in the clarity of the explanation provided. Overall, 86.0% of both public and private outpatients had a very good or good experience of being given clear explanations by health practitioners. Private sector users were significantly more likely than public sector users to indicate that the health care provider gave a very good explanation (47.8% compared to 17.1%) whereas more than 60.0% of public sector users believed that health care providers provided good explanation compared to private health care providers (63.8% compared to 47.3%) ($p < 0.05$).

The results in Table 3.10.4.12 for patient experiences of provider explanations attending inpatient health care facilities were similar to outpatient health care facilities. Overall, 88.4% of all inpatients thought their experience of their interaction with service providers in health facilities was very good or good based on receiving clear explanations for their conditions. Most private inpatient users had a very good experience of heath provider explanations compared to a lower proportion of public inpatient users (66.9% compared to 26.9%), whereas most public inpatient users had a good experience of health provider explanations compared to private inpatients (58.1% compared to 29.9%) ($p < 0.05$). A negligent proportion reported the experience as bad or very bad.

Involvement of patients in decision-making

One of the hallmarks of a good health care system is involving patients in making decisions about the treatment to be administered. The assumption is that when patients participate in the decisions regarding treatment they are likely to adhere to prescribed treatments. The extent to which providers inform patients at the point of care about available options given their needs, preferences, values and personal situations is less understood in South Africa. A lack of certainty about how shared decision-making may impact practitioners, particularly through litigation, is likely to discourage change, perpetuating the conventional practice of doctors or treatment teams making decisions without helping patients to understand the treatment, options and possible outcomes. The autonomy of patients in health care can be facilitated by providing information and decision-sharing, and this should be encouraged.

This study assessed the extent to which health care providers involve inpatients in making decisions about the treatment to be provided. Overall, participants believed that health care providers involved them in decisions about their inpatient care as 85.2% of all inpatients indicated they had a very good or good experience being involved in decision-making (Table 3.10.4.13). Private sector inpatients were significantly more likely than public sector outpatients to believe that health care providers were very good in involving them in decisions (57.8 compared to 25.0%) whereas public sector inpatients believed that health care providers were good at involving them ($p < 0.05$).

Similar analysis was conducted for outpatient users. Overall, participants believed that health care providers involved them in decisions about their outpatient care as 83.1% of all outpatients indicated they had a very good or good experience being involved in decision-making (Table 3.10.4.14). Private sector outpatients were significantly more likely than public sector outpatients to believe that health care providers were very good in involving them in decisions (41.5% compared to 16.3%) whereas 61.3% public sector outpatients believed that health care providers were good in involving them compared to 51.1% ($p < 0.05$).

Table 3.10.4.11: How clearly health providers explained conditions to participants at outpatient health care facilities, South Africa 2012

Type of facility	Very good		Good		Moderate		Bad		Very bad		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Public	17.1	[14.3–20.4]	63.8	[59.8–67.6]	13.4	[10.7–16.6]	4.2	[2.9–6.0]	1.4	[0.8–2.6]	1 666
Private	47.8	[40.0–55.8]	47.3	[39.2–55.6]	3.8	[2.1–6.8]	0.9	[0.3–2.8]	0.2	[0.0–0.6]	801
Other	*	*	*	*	*	*	*	*	*	*	37
Total	28.0	[24.4–32.0]	58.0	[54.1–61.8]	10.0	[7.8–12.6]	3.0	[2.1–4.3]	1.0	[0.6–1.7]	2 504

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.10.4.12: How clearly health providers explained conditions to participants at inpatient health care facilities, South Africa 2012

Type of facility	Very good		Good		Moderate		Bad		Very bad		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Public	26.9	[21.1–33.6]	58.1	[51.8–64.1]	8.7	[6.2–12.2]	3.7	[2.1–6.2]	2.7	[0.9–7.8]	686
Private	66.9	[58.9–74.1]	29.9	[22.8–38.1]	1.6	[0.7–3.8]	1.6	[0.6–4.3]	0.0	*	259
Other	*	*	*	*	*	*	*	*	*	*	5
Total	38.1	[32.5–44.0]	50.3	[44.9–55.8]	6.6	[4.8–9.1]	3.0	[1.9–4.9]	1.9	[0.6–5.7]	950

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.10.4.13: Experience of being involved in making decisions about treatment options at inpatient health care facilities among all participants aged 15 years and older, South Africa 2012

Type of facility	Very good		Good		Moderate		Bad		Very bad		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Public	25.0	[19.0–32.1]	56.5	[49.7–63.1]	9.6	[6.9–13.2]	5.8	[3.2–10.4]	3.2	[1.5–6.6]	687
Private	57.8	[48.5–66.6]	36.6	[27.8–46.3]	2.8	[1.2–6.6]	2.8	[1.2–6.2]	0.0	*	259
Other	*	*	*	*	*	*	*	*	*	*	5
Total	34.1	[28.5–40.2]	51.1	[45.4–56.8]	7.6	[5.6–10.2]	4.9	[2.9–8.3]	2.3	[1.0–4.8]	951

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.10.4.14: Experience of being involved in making decisions about treatment options at outpatient health care facilities, South Africa 2012

Type of facility	Very good		Good		Moderate		Bad		Very bad		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Public	16.3	[13.5-19.5]	61.3	[57.2-65.3]	15.5	[12.5-19.0]	5.2	[3.8-7.2]	1.7	[0.9-3.0]	1 662
Private	41.5	[34.2-49.2]	51.1	[43.2-59.0]	5.3	[3.2-8.8]	1.9	[0.9-3.9]	0.2	[0.0-0.6]	799
Other	*	*	*	*	*	*	*	*	*	*	37
Total	25.1	[21.8-28.8]	58.0	[53.8-62.0]	11.9	[9.5-14.8]	4.0	[3.0-5.3]	1.1	[0.6-1.9]	2 498

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.10.4.15: Manner in which health services ensured that participants could talk privately to health providers in order to provide information at outpatient health care facilities, South Africa 2012

Type of health facility inpatient care	Very good		Good		Moderate		Bad		Very bad		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Public Hospital/clinic	17.4	[14.4–20.8]	66.3	[62.2–70.1]	11.5	[9.3–14.2]	3.2	[2.1–4.9]	1.6	[0.9–2.9]	1 664
Private hospital/clinic/doctor	45.6	[37.9–53.5]	49.8	[41.7–57.9]	3.3	[1.8–6.1]	1.1	[0.4–3.1]	0.1	[0.0–0.7]	798
Other	*	*	*	*	*	*	*	*	*	*	37
Total	27.3	[23.7–31.2]	60.6	[56.3–64.7]	8.7	[6.8–10.9]	2.4	[1.6–3.6]	1.1	[0.6–1.9]	2 499

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.10.4.16: Manner in which health services ensured that participants could talk privately to health providers in order to provide information at inpatient health care facilities, South Africa 2012

Type of health facility inpatient care	Very good		Good		Moderate		Bad		Very bad		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Public hospital	24.9	[19.2–31.7]	56.7	[50.1–63.1]	12.7	[8.9–17.8]	3.0	[1.7–5.3]	2.6	[1.1–6.0]	684
Private	66.7	[57.9–74.4]	30.7	[23.2–39.4]	2.0	[0.8–4.8]	0.6	[0.1–3.2]	0.0	*	259
Other	*	*	*	*	*	*	*	*	*	*	7
Total	36.7	[31.0–42.7]	49.6	[44.0–55.2]	9.6	[6.8–13.3]	2.3	[1.4–3.9]	1.8	[0.8–4.3]	950

95% CI: 95% confidence interval

** Too few observations to record reliably*

Experience of privacy

It is important to ensure patients feel comfortable when receiving care from health professionals; privacy is important both during treatment and when discussing health care options. Both inpatient and outpatient users were asked about their experiences of having privacy when talking to health practitioners about their health care. For outpatient care, both public and private outpatients mostly had very good or good experiences (87.9%); however, private outpatients were much more likely to have a very good experience with privacy when speaking with health care providers compared to public outpatients (45.6% compared to 17.4%), and public outpatients were more likely to have a good experience compared to private outpatients ($p < 0.05$) (Table 3.10.4.15).

Results for inpatient experiences followed a similar pattern. While overall both public and private inpatients had a very good or good (86.3%) experience with the way health providers ensured privacy in communication with patients, differences were evident between the public and private sector users (Table 3.10.4.16). Private sector users were more likely than public sector users to have a very good experience (66.7% compared to 24.9%) and public sector inpatients were more likely to have a good experience than private inpatients (56.7% compared to 30.7%) ($p < 0.05$).

Choice of health care provider

Another important element of good quality care is ensuring patients are happy with their health care provider. Participants were asked about the ease with which they could see a health care provider they were happy with; overall, the majority of inpatient users (86.9%) were able to see the health care provider with whom they were happy. Private sector users were significantly more likely than public sector users to feel very good with the health care provider who served them (62.5% compared to 24.9%). The corollary is that public sector users were significantly more likely than private sector users to have good experience with the provider who served them (58.0% compared to 34.4%).

Similar results were observed for outpatient users (Table 3.10.4.18). Overall, both public and private outpatient users indicated their experience of the ease with which they could see a health care provider they were happy with was very good or good (84.0%). The experience was very good for private sector patients (44.3%) compared to public sector patients (15.9%), a statistically significant difference. The majority of the public sector patients felt good (63.6%) with the ease with which they could see a health provider they were happy with.

Cleanliness of facilities

Facility cleanliness is a matter of pleasantness as well as infection control. Cleanliness may relate to specific places that inpatients use, such as amenities and wards, or general use spaces, such as waiting rooms and corridors where they meet visitors. Cleanliness of health care facilities is one of the priority areas for patient-centred care according to national quality standards under Domain 7 of the National Core Standards (NCS).

Cleanliness is also an important factor in determining facility users' satisfaction with the quality of health services. The majority of both public and private outpatients found the cleanliness of facilities to be very good or good (88.8%) (Table 3.10.4.19). A larger proportion of private outpatients thought the cleanliness was very good compared to public outpatients (50.4% compared to 22.0%), whereas a larger proportion of public outpatients thought cleanliness was good compared to private outpatients ($p < 0.05$). A negligent proportion felt that the facilities were not clean (under 2%).

Table 3.10.4.17: Ease with which patient could see a health provider they were happy with at in-patient health care facilities, South Africa 2012

Type of facility	Very good		Good		Moderate		Bad		Very bad		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Public	24.9	[19.6–31.2]	58.0	[51.5–64.1]	12.8	[9.5–17.1]	3.7	[2.1–6.5]	0.5	[0.2–1.5]	678
Private	62.5	[54.0–70.3]	34.4	[26.8–42.9]	1.5	[0.6–3.7]	1.6	[0.5–5.2]	0.0		259
Other	*	*	*	*	*	*	*	*	*	*	7
Total	35.5	[30.4–41.0]	51.4	[46.2–56.5]	9.6	[7.2–12.8]	3.1	[1.8–5.1]	0.4	[0.1–1.1]	944

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.10.4.18: Ease with which patient could see a health provider they were happy with at outpatient health care facilities, South Africa 2012

Type of facility	Very good		Good		Moderate		Bad		Very bad		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Public	15.9	[13.2–18.9]	63.6	[58.8–68.0]	15.1	[11.9–19.0]	4.3	[3.0–6.2]	1.2	[0.7–2.0]	1 666
Private	44.3	[36.6–52.3]	48.1	[40.0–56.4]	7.0	[4.4–10.9]	0.4	[0.2–1.1]	0.1	[0.0–0.7]	796
Other	*	*	*	*	*	*	*	*	*	*	37
Total	25.9	[22.5–29.7]	58.1	[53.8–62.2]	12.3	[9.6–15.5]	2.9	[2.0–4.1]	0.8	[0.5–1.3]	2 499

95% CI: 95% confidence interval

** Too few observations to record reliably*

3.10.4.19: State of cleanliness of outpatient health care facilities, South Africa 2012

Type of facility	Very good		Good		Moderate		Bad		Very bad		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Public	22.0	[18.7–25.7]	63.2	[58.5–67.7]	11.2	[8.4–14.7]	2.7	[1.7–4.2]	1.0	[0.5–1.8]	1668
Private	50.4	[41.9–58.9]	44.8	[36.6–53.3]	4.5	[2.4–8.2]	0.2	[0.1–0.7]	0.0	[0.0–0.2]	799
Other	*	*	*	*	*	*	*	*	*	*	37
Total	32.2	[28.2–36.4]	56.6	[52.2–60.9]	8.8	[6.7–11.5]	1.8	[1.2–2.8]	0.6	[0.3–1.1]	2504

95% CI: 95% confidence interval

** Too few observations to record reliably*

The majority (88.7%) of inpatients, both public and private, also found facility cleanliness to be very good or good. Again, a larger rate of private inpatients found facility cleanliness to be very good compared to public inpatients (68.5% compared to 31.3%), and a larger rate of public inpatients found facility cleanliness to be good compared to private inpatients (53.6% compared to 29.4%) ($p < 0.05$). Again, a negligent proportion (under 3%) thought the facilities were not clean (Table 3.10.4.20).

Availability of medications

For health care practitioners to provide good quality care, it is critical that medicines are available and stockouts avoided. Sufficient availability of medication for health care facilities is included in Domain 3 of the Department of Health's National Core Standards (NCS) for Health Establishments in South Africa on Clinical Support Services as a critical functional area for health care. This domain comprises 'specific services essential in the provision of clinical care and includes the timely availability of medicines and efficient provision of diagnostic, therapeutic and other clinical support services and necessary medical technology, as well as systems to monitor the efficiency of the care provided to patients' (Whittaker, Shaw, Spieker et al. 2011: 63).

Participants were asked about their perceptions of the availability of medicines at both outpatient and inpatient health care facilities. The majority of outpatients, both public and private sector users, found the availability of medicines to be very good or good (84.0%) (Table 3.10.4.21). Private outpatients were more likely than public outpatients to find medicine availability to be very good (49.1% compared to 17.6%), and the inverse was true for perceptions that medicine availability was good ($p < 0.05$). A negligible proportion of outpatients found the availability of medicines to be bad or very bad.

Medicines were generally available in inpatient facilities given that 88.6% of participants perceived the availability of medicines to be very good or good (Table 3.10.4.22). Though there were differences in perceptions between private and public sector users, overall fewer than 3% believed that the availability of medicines was bad or very bad. Private sector users were significantly more likely than public sector users to perceive medicine availability to be very good (66.2% compared to 29.1%) and the corollary is that public sector users were significantly more likely than private sector users to view the availability of medicines as good (55.9% compared to 31.1%).

Availability of tests

In addition to ensuring medicines are available at health care facilities, it is also considered important that tests are available in-facility for good quality health care provision. Patient perceptions on the availability of diagnostic equipment and medical devices are important because some of these technologies do not only enable health providers to perform their roles, they can also save lives. Safe and appropriate medical devices are necessary for clinicians to prevent, diagnose and treat illnesses (WHO 2010).

Perceptions of the availability of testing in outpatient facilities were asked of participants. The majority of both private and public sector users found outpatient facilities to have very good or good availability of tests (83.0%) (Table 3.10.4.23). Private outpatients were more likely to believe the availability of tests was very good compared to public outpatients (47.7% compared to 17.0%), and public sector outpatients were more likely to think the availability of tests was good compared to private outpatients (59.2% compared to 48.2%). A small proportion of public sector users (6.3%) found the availability of tests inadequate, a figure that is significantly higher than that of private sector users (0.3%).

Table 3.10.4.20: State of cleanliness of inpatient health care facilities, South Africa 2012

Type of facility	Very good		Good		Moderate		Bad		Very bad		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Public	31.3	[25.7–37.5]	53.6	[47.5–59.6]	11.6	[8.5–15.6]	3.0	[1.5–5.8]	0.4	[0.1–1.5]	679
Private	68.5	[59.8–76.1]	29.4	[21.9–38.2]	0.7	[0.2–2.0]	1.4	[0.3–5.5]	0.0		260
Other	*	*	*	*	*	*	*	*	*	*	7
Total	41.9	[36.8–47.3]	46.8	[41.5–52.2]	8.4	[6.3–11.2]	2.5	[1.4–4.6]	0.3	[0.1–1.1]	946

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.10.4.21: The availability of medication at outpatient health care facilities, South Africa 2012

Type of facility	Very good		Good		Moderate		Bad		Very bad		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Public	17.6	[14.8–20.9]	60.0	[56.1–63.9]	12.9	[10.5–15.7]	7.1	[5.0–10.1]	2.3	[1.5–3.6]	1 668
Private	49.1	[40.9–57.3]	46.9	[38.8–55.2]	3.5	[1.7–6.9]	0.4	[0.1–1.4]	0.1	[0.0–0.4]	799
Other	*	*	*	*	*	*	*	*	*	*	37
Total	28.8	[25.0–32.9]	55.2	[51.3–59.1]	9.7	[7.9–11.9]	4.8	[3.3–6.7]	1.5	[1.0–2.3]	2 504

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.10.4.22: The availability of medication at inpatient health care facilities, South Africa 2012

Type of facility	Very good		Good		Moderate		Bad		Very bad		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Public	29.1	[23.4–35.5]	55.9	[49.7–62.0]	11.1	[8.0–15.2]	2.9	[1.7–4.9]	1.0	[0.3–4.0]	677
Private	66.2	[57.4–74.0]	31.1	[23.5–39.8]	2.2	[0.9–5.5]	0.5	[0.1–3.8]	0.0		261
Other	*	*	*	*	*	*	*	*	*	*	5
Total	39.6	[34.0–45.4]	49.0	[43.6–54.4]	8.6	[6.2–11.6]	2.2	[1.3–3.7]	0.7	[0.2–2.8]	943

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.10.4.23: The availability of tests at outpatient health care facilities, South Africa 2012

Type of facility	Very good		Good		Moderate		Bad		Very bad		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Public	17.0	[14.2–20.2]	59.2	[55.0–63.2]	15.7	[13.0–18.9]	6.3	[4.5–8.7]	1.8	[1.1–2.8]	1 665
Private	47.7	[39.7–55.8]	48.2	[40.1–56.4]	3.7	[2.1–6.3]	0.3	[0.1–1.1]	0.1	[0.0–0.4]	798
Other	*	*	*	*	*	*	*	*	*	*	37
Total	27.9	[24.2–31.9]	55.1	[51.1–59.0]	11.6	[9.6–14.0]	4.2	[3.0–5.8]	1.2	[0.8–1.9]	2 500

95% CI: 95% confidence interval

** Too few observations to record reliably*

Table 3.10.4.24: The availability of tests at inpatient health care facilities, South Africa 2012

Type of facility	Very good		Good		Moderate		Bad		Very bad		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Public	26.6	[21.0–33.0]	57.9	[51.3–64.2]	10.3	[7.1–14.8]	4.8	[2.8–8.3]	0.4	[0.2–1.2]	677
Private	67.1	[58.6–74.6]	31.7	[24.3–40.3]	1.0	[0.3–3.3]	0.1	[0.0–0.8]	0.0	*	259
Other	*	*	*	*	*	*	*	*	*	*	6
Total	38.1	[32.8–43.7]	50.6	[44.9–56.2]	7.6	[5.3–10.8]	3.4	[2.0–5.9]	0.3	[0.1–0.8]	942

95% CI: 95% confidence interval

** Too few observations to record reliably*

For inpatient care, the majority of private and public users found facilities to have very good or good availability of tests (88.7%) (Table 3.10.4.24). Private inpatient users were more likely to think the availability of tests was very good compared to public inpatient users (67.1% compared to 26.6%), and public outpatient users were more likely to think availability of tests was good compared to private outpatients (57.9% compared to 31.7%) ($p < 0.05$). No private inpatients found the availability of tests to be bad or very bad and the proportion in the public sector was also low, though higher than in the private sector.

Discussion

This section discusses key findings with regards to access to health care services; reasons for seeking health care; out- and inpatient and care utilisation patterns; reasons for seeking out- and inpatient care; source of payment for both out- and inpatient care. The section concludes by discussing findings on satisfaction with health care service provision and the quality of health care services provided.

Accessing needed health care services

The results of this study suggest that the majority of respondents were able to access health care services when needed. Studies of equity in healthcare rely mostly on utilisation to measure access to health care (Hernandez-Quevedo & Jimenez-Rubio 2009; Hjern, Haglund, Persson et al. 2001; Reijneveld 1998; Szczepura 2005; Stronks, Ravelli & Reijneveld 2001; Uiters, Deville, Foets et al. 2006). Utilisation is therefore seen as a consequence of access to health care and based on this measure it can be concluded that the health care services in the country are accessible to the general population. Increasing access is in line with the government objective to make health care accessible for all irrespective of race or social status (DoH 1997; NDoH 2011; Shisana 2013).

Although equity in access to healthcare is a fundamental value that the South African health care system seeks to achieve, differences in health care utilisation patterns by race were observed. The results showed that whites still have greater access to health care services than black Africans. This suggests that there are still existing disparities that are associated with socio-economic status and race. The findings in this study are supported by previous South Africa surveys that have shown that whites tend to have more access to private health insurance through medical schemes (Ataguba & McIntyre 2009; Roberts, WaKivilu & Davids 2009) and that medical scheme membership increases access to health care (Ataguba & McIntyre 2009; McIntyre, Okorafor, Ataguba et al. 2008). Ataguba and McIntyre (2009), for example, found that there is an unequal share of health benefits, where the richest 40% of the population receives about 60% of the health care benefits. The observed disparities are despite the transformation that has taken place in the country. Access to medical aids ensures that the majority of white South Africans are less likely to delay or put off seeking health care because of concerns related to the cost of accessing care. Indeed, whites continue to benefit from accumulated privilege from years of colonisation and apartheid and they still have greater access to wealth and resources, even in the new dispensation.

Reasons for seeking health care at last visit

In South Africa, both acute and chronic health care services have been characterised as under increasing pressure as a result of the high burden of communicable, non-communicable and injury-related conditions (Mayosi, Flisher, Lalloo et al. 2009). According to Puoane, Tsolekile, Parker et al. (2008) NCDs now account for 37% of all causes mortality and 16% of disability-adjusted life years in South Africa. The WHO estimates the burden from NCDs in South Africa as two to three times higher than that in developed countries (WHO 2008).

Although there are high rates of communicable diseases such as TB and HIV in South Africa (NDoH 2012; Mayosi, Flisher, Lalloo et al. 2009), the results of the current study show that acute and other illnesses were the most-cited reasons for seeking care, followed by chronic disease. Only a very small proportion of the population indicated they sought care for communicable diseases; however, it is possible that persons with communicable diseases could have fallen under the acute and other categories for several reasons. Firstly, respondents with communicable diseases such as HIV and TB, the two most widespread, may not specify those conditions as their reason for seeking health care. A person with HIV may indicate a different condition as their presenting problem. For instance, respondents may indicate pneumonia (cough) or cancer, as their primary condition while the underlying condition is HIV; therefore those who could have fallen under the category of communicable disease because of their HIV status may have instead been classified as acute, chronic, or 'other.' Similarly a person with TB may have reported the reason for seeking care as a cough, which would have then been classified as acute. This highlights known challenges with patient self-reported data in general.

Secondly, the lower rates of chronic, or NCDs as reason for seeking care compared to acute or other reasons could be because there is still more focus on screening and diagnosing communicable diseases than chronic lifestyle diseases in South Africa. Indeed there are more deaths from infectious or communicable diseases than chronic diseases in South Africa; however, the rate of chronic diseases is rising rapidly in the African region and they are expected to become the most common causes of death by 2030 (WHO 2011). There is now increased attention on NCDs in South Africa; however, this will need to be strengthened by an increase in prevention and screening of individuals who are at risk of developing NCDs in order to reduce the current trend in the increase in the NCD-related burden (Puoane, Tsolekile, Parker et al. 2008). This is even more critical to address in the face of an increasing obesity epidemic that is associated with NCD conditions such as type 2 diabetes even among young people in South Africa (Joubert, Norman, Bradshaw et al. 2007; NDoH 2007; Reddy, James, Sewpaul et al. 2010; Steyn 2006; Zimmet, Alberti & Shaw 2001).

Generally, the study found that young people are less likely to use health care services compared to older people. This is because younger people have a good health status. In this survey, it was found that young people were more likely to report seeking health care for other reasons – this is the category where injury fell. These results supports previous surveys by showing that there is a high prevalence of injuries among young people and this may explain why they sought care for other reasons more than older age groups who tend to present more with chronic conditions with age. From time to time young people may experience emotional, psychological and physical health problems that need medical care. Studies that have assessed the health status of young people report a high prevalence of health-risk behaviours and that these high risk behaviors are more likely to result in young people being ill. Furthermore, it has been found that young people tend to present with injuries and trauma than chronic conditions seen among older people (Reddy, James, Sewpaul et al. 2010). Injuries and trauma are often a result of violence, unsafe road use, alcohol abuse. Risky sexual behaviour, in turn, exposes young people to health risks such as sexually transmitted infections (STIs) including HIV.

In contrast, as the population ages, chronic diseases of lifestyle (CDL), such as hypertension, asthma and diabetes, become a significant feature of the nation's health profile. This is reflected in the current results, which showed rates of chronic disease increased with age, and that people over the age of 55 years sought care for chronic illness at higher rates than other reasons. Chronic conditions tend to result in an increase of health utilisation and may result in inpatients being admitted to inpatient health care facilities (Abegunde, Mathers, Adams et al. 2007). Older people are also likely to be affected by multiple morbidities that require both acute and long-term health care (Day & Gray 2010).

Inpatient care utilisation patterns, reasons for seeking inpatient care and source of payment

The study found that there is generally a serious burden on inpatient health services in South Africa. The demand for inpatient services creates a particularly heavy burden for public facilities, which cared for a greater proportion of inpatients than private facilities. It was found that more than 1 in 10 people over the age of 15 years stayed at least one night in a health care facility during the past 12 months. As expected, females were more likely to have been hospitalised in the past 12 months compared to their male counterparts. Hospitalisation of females for pregnancy-related reasons may explain their greater likelihood of using inpatient health services compared to males. An analysis by age showed that a greater proportion of middle-aged adults used private inpatient facilities compared to young and older people pointing to the relationship between access to employment, medical aids and access to private inpatient care, a pattern which was also observed in a study by McIntyre, Okorafor, Ataguba et al. (2008). As was seen previously with regards to health care utilisation by race, black Africans were more dependent on public inpatients facilities while whites were three times more likely to use private hospitals than black Africans.

Residents of urban informal areas were significantly more likely than residents in rural areas to have stayed in inpatient facilities. These results may point to a range of issues namely access for rural areas and the association of urban informal areas with diseases due to poverty, high density, poor sanitation, other structural and environmental factors that contribute to the spread of diseases. The introduction of National Health Insurance and increased resources to the public sector should bolster the capacity of public facilities to manage the high demand for inpatient care.

The high utilisation rate of inpatient care points to increased HIV and AIDS related morbidity; a weakness in the primary health care system and a need to shift emphasis back to this level. According to Mayosi, Flisher, Lalloo et al. (2009), the rising morbidity and mortality related to non-communicable and communicable diseases have major implications for the delivery of acute and chronic health care services. Chopra, Lawn, Sanders et al. (2009: 837) state that 'referral systems are mostly suboptimum, and many patients bypass lower levels and access higher levels of care. Thus, regional and tertiary services provide a high proportion of care that could be more appropriately provided by district hospitals.' This observation is supported by Mojaki, Basu, Letshokgohla et al. (2011) who found that the South African public health sector referral system is often side-stepped. Skipping lower levels of care, a route often only accessible to those with financial means, may be attributed to a lack of confidence in the health facilities at the primary level. Indeed there has been a shift towards integrating health services and discouraging fragmented service provision in the country (NDoH 2011c). This approach means organising services in such a way that the district health system provides all primary health care services relating to prevention, promotion and curative/treatment in an integrated way and based on patient needs. These developments are part of the Department of Health's Primary Health Care Re-engineering initiative; a strategy related to the plans for National Health Insurance that will hopefully address the current anomaly (NDoH 2011c); and over time there should be an increase in satisfaction, trust and utilisation of primary care services.

With regards to the reason for admissions in health facilities, the study found that inpatients care hospitalisation for communicable diseases was reported by a small percentage (3.6%) of respondents. This is in contrast to the evidence pointing to an overwhelming prevalence of communicable diseases such as HIV, AIDS and tuberculosis (Mayosi, Flisher, Lalloo et al. 2009). The most commonly reported reason for seeking inpatient care was 'other' followed by chronic conditions and acute conditions. When the data was analysed by sex we found that more males compared to females needed inpatient care for chronic, acute and communicable conditions. This might be explained by the fact that males in general are less likely to present at primary health facilities for screening service hence more likely to present late for treatments and need to be admitted to hospital. However, there were more females who needed inpatient care due to conditions classified under 'other'. With regards to age, it was found that reasons for inpatient care for young people aged 15–34 years were mainly acute conditions and 'other'; while adults aged 35–65 years and above tended to need inpatient care for chronic conditions than acute conditions. An Agincourt study estimated that the burden of disorders requiring chronic care increased disproportionately relative to disorders requiring acute care (Tollman, Khan, Sartorius et al. 2008). As mentioned previously, the high burden of chronic morbidity highlights the need to scale up the delivery of primary health care services to meet the expanding demand for chronic care (Mayosi, Flisher, Lalloo et al. 2009).

Interestingly contrary to anecdotal evidence often reported in the media which tends to suggest that the general population is dissatisfied with inpatient health care services, the majority of the participants interviewed were satisfied with the inpatient care received at the last hospital visit. There were slight difference with regards to satisfaction level with inpatient public care receiving (83%) compared to that received by the private health sector (92.1%). The rate of very satisfied was much higher in the private sector than in the public sector (69.5% compared to 32.7%). Similar findings were also reported by McIntyre, Okorafor, Ataguba et al. (2008). When data are analysed by sex, it was noted that more males than females were very satisfied and satisfied with the inpatient health care services. This might be explained by the observation that males unlike females tend to have limited contact with health care services in general hence they may have a limited point of reference compared to females. In contrast females may have multiple experiences with the health care services in their capacity as patients and as caregivers bringing children and family members to access inpatients care services.

With regards to source of payment for last inpatient visit, it was found that payments for the last inpatient health care for participants aged 15 years and older over the last 12 months were contributions from the medical aid, followed by the respondent, other and spouse. The majority of visits were free of charge meaning they were accessed through the public sector. It was observed that there were more males than females who paid through the medical aid and that more females than males received free inpatient care. This suggests that females are more dependent on the public health service compared to males. This may reflect also access to employment and medical schemes, which are mostly accessed through employers. Indeed in line with this evidence, medical schemes as a source of payment for inpatient care was mainly used by residents in urban formal participants while urban informal residents used free of charge health care. There were also significant differences in the use of medical schemes to pay for inpatient care in the different provinces with Western Cape having the highest users of medical aid to pay for private inpatient care (41.7%) and North West having the lowest rate (12%). Western Cape is a province with disproportionate wealth and a high number of white residents; this could explain why private outpatient facilities are utilised more in Western Cape compared to other provinces.

By race, whites were more likely to pay privately for their inpatient care compared to blacks who utilised more free-of-charge inpatient care. This can be explained by the fact that whites are more likely than other racial groups to have access to medical schemes or insurance, hence their likelihood to use private outpatient facilities (Shisana 2013). Interestingly, North West had the highest number of participants who used free inpatient care services while Free State Province registered the lowest number of participants who use of free of charge inpatient care; a finding that will need to be investigated further.

Outpatient care utilisation patterns, reasons for seeking inpatient care and source of payment

As expected more respondents used outpatient health care services than inpatient health care services in the 12 months before the survey. Very few patients reported seeking care in private health facilities. Urban formal residents residents used the the private sector got health care than both urban informal and rural informal residents. Unlike inpatient health care services, males were significantly more likely than females to have received outpatient care at least once in a year. However, female respondents were more likely to have received outpatient care two times and more compared to males. By race, Indian respondents had the highest number of visits ranging between four or more times in the past 12 months. A finding that might point to high levels of morbidity in this group indeed almost 50% of Indians indicated chronic conditions as their reason for seeking outpatient care. As expected it was found that outpatient care is accessed yearly at least once by about 46% of the population over the age of 15. While this may suggest in general the population has a good health status this could also reflect a lack of preventative care through annual medical checkups in the majority of the population.

The findings in the current study differ slightly from those of McIntyre, Okorafor, Ataguba et al. (2008) who found that the public outpatient services were accessed by 60% of the population while the private outpatient facilities were accessed by only 20% of the population. It appears that utilisation of outpatient facilities may have increased in recent years. In the current study, we found that 66.7% of respondents reported using public outpatient facilities while about 31% used private care as was observed by McIntyre, Okorafor, Ataguba et al. (2008). In the current study, it was also found that, similar to inpatient care, public outpatient health care facilities shoulder the burden of the demand for outpatient health services and a much smaller proportion of the population has access to private health care services. Private facilities are utilised for outpatient care more in urban areas compared to rural areas. An analysis by race also showed that whites are more likely to use private care compared to other race groups, and that utilisation of private health facilities is higher in Western Cape. Reasons for the observed disparities between rural and urban include the fact that there is a greater concentration of private facilities in urban areas, making such services more accessible to urban dwellers than those who live in rural areas.

With regards to reasons for seeking outpatient care, it was observed that acute conditions were a leading cause for a visit to an outpatient health care provider for a third of respondents. Slightly less than a third of respondents had visited an outcare facility for a chronic condition and as seen with inpatient care only a very small percentage visited for communicable diseases. The remainder sought care for other conditions (such as maternal and perinatal conditions, nutritional deficiencies, surgery and injury). Interestingly, the reasons for seeking care did not differ by sex of the respondent regardless of the presenting condition. As expected, the elderly (65 years and older) sought significantly less care fro acute conditions than the rest of the age groups, but they sought care for chronic conditions. It was observed that the degree of outpatient care utilisation changes with age. For example, the increased likelihood of chronic illness and poor health observed more in old age explain why older populations seek outpatient care more than younger people. As expected, there was a significant association of age and chronic conditions as presenting problems in outpatient facilities in the study population.

Interestingly, participants in urban areas sought outpatient care for acute conditions than rural participants who sought outpatient care for chronic conditions. Another concerning finding is that rural populations sought outpatient care than urban populations suggesting high levels of morbidity. This was observed in the large rural populations in Northern Cape, Eastern Cape, North West and Limpopo. It not clear why these provinces had the greatest rates of outpatient care utilisation than other provinces, possible reasons could include poor access to preventative services and other self-treatment means such as a local pharmacy. More individuals in urban areas sought access to pharmacies for minor ailments that can be treated using over the counter medication. In contrast, populations found in the rural areas may not have immediate access to a pharmacy close to their home and they may also not have the cash needed to access private pharmacies; hence, they may have visited an outpatient facility more than individuals in urban areas where such facilities are easily accessible.

Amongst the different race groups more than a third of the black African and a quarter of whites participants indicated acute conditions as the reason for needing outpatient care. However, almost 50% of the Indians and 30.5% of coloureds indicated chronic conditions as their reason for seeking outpatient care suggesting a need for further investigations to determine risk factors for chronic diseases that are specific to these race groups. It is important that the population interact with health care providers in outpatient facilities for effective health promotion and prevention. Community-centred care through ward-based health care outreach teams and school health services as part of the Department of Health’s Re-engineered Primary Health Care will encourage the population to seek health advice on a regular basis, increasing the proportion of the population that seeks outpatient care.

With regards to satisfaction with outpatient care, it was observed that overall satisfaction among participants was high. There was no significant difference in satisfaction between male and female participants, different age groups and between urban and rural participants. There was also no significant difference in satisfaction with outpatient care in the different provinces except for North West where only 63.1% were satisfied with outpatient care they received. Although there was no significant difference in satisfaction with outpatient care received among all race groups, black Africans were less satisfied than all race groups, followed by coloured participants.

With regards to source of payment, the study found that payments for the last outpatient health care for participants aged 15 years and older over the last 12 months were contributions from the medical aid, followed by the respondent, other and spouse and the rest were free of charge. An analysis by sex shows that more males than females paid for outpatient care through the medical aid suggesting that men have more access to medical aid through their employers compared to females. As observed with inpatient care, females were more dependant on free outpatient care compared to males. Similar finding were reported by McIntyre, Okorafor, Ataguba et al. 2008. As was seen with source of payment for inpatient care, medical aid as a source of payment for outpatient was mainly used by residents in urban formal participants while urban informal residents depended on free-of-charge health care. There was however a significant difference in the use of medical aid to pay for outpatient care in the different provinces. The differences in the use of medical aid were also seen among different race groups. More whites used medical aid for outpatient care compared to Africans. An analysis by race showed that black Africans (64.6%) and coloureds (60.3%) are the most users of the free outpatient health care. Fewer whites used free outpatient care. Interestingly, Free State and Western Cape were the only two provinces where fewer than 50% of the participants reported using free outpatient health services. Similar patterns emerged with regards to inpatient care.

Satisfaction with health care services

Schlesinger and Lee (1993) argue that health care is a unique social policy because of its universal implications and nearly universal direct experience with the system. The Department of Health takes seriously public perceptions on health care. Conducting patient satisfaction surveys is part of the assessment of National Core Standards indicators and a prominent feature of National Health Insurance. Understanding the level of satisfaction with the quality of health care among users is important. This is because the current wave of health reform emphasizes patient-oriented improvement of health care services. Perera and Moriarty (2013) indicate that patient-based indicators that should be assessed in improving quality of health care provision are patient satisfaction and individual patient outcomes.

Patient satisfaction is measured mainly using interaction with the provider and the environment in which care is provided. When patients visit a health facility, they expect the health care provider to treat them in a respectful and professional manner, within a considerate and supportive environment, where their privacy is protected and dignity maintained (Peltzer & Phswana-Mafuya 2012). Marcinowicz, Chlabicz & Grebowski (2009), argues that provider-patient interactions play a very significant role in the choice of health care provider and patient satisfaction. When patients are not treated with respect, they are likely to change their health provider and changing health facilities or providers could impact negatively on individual continuity of care.

Public perceptions of health care are an important reflection of a country's health care system. According to the current study, it appears that the South African population is overwhelmingly satisfied with health services, including health services in their area of residence, and health care provision in their area of residence. These results contradict accounts of the dismal state of health care in the country. However, if judged only on current perceptions, the many real problems in the South African health care system could be overlooked. A recent audit of public health care facilities in South Africa rated facilities' compliance with minimum standards and performance was shockingly low across the board (Health Systems Trust 2013). It is therefore important to remember that public perceptions are shaped by other factors in addition to first-hand experience, such as the media, information received from others, influence of political leaders, personal disposition, or national events (Bleich, Özaltin & Murray 2009; Soroka & Maioni 2012). The high satisfaction ratings of the health care system found in the current study could be shaped by such factors. Such explanations shed light on the discrepancies between public perceptions of health care facilities and technical studies of poor health care facility quality in South Africa.

Satisfaction with health care services in the area and health care service provision

General satisfaction with health services in one's area is shaped by personal experience and occurs because patients found it easy to access and use the services, and also because the outcomes of using the services were desirable. However, it is important to take recall bias into consideration since questions about perceptions of health care services and health care provision in the area were asked not only of patients during the past 12 months but of all study participants. The dual-strategy used to deliver health care services, primary health care and district health system was adopted to ensure that patient access affordable and effective basic packages of care without having to resort to costly services. When patients believe that the system of facilities in their area is adequate to meet the needs of both ambulatory patients and inpatients, users are likely to express satisfaction about provision of care in their area.

The majority of participants were very satisfied or satisfied with health care services and health care provision in the respondents' area of residence. The level of satisfaction with the way health facilities are run in the areas respondents lived is an important aspect of perceptions on the quality of health care received in primary health care organised around the District Health System.

The study observed lower ratings in Free State and North West in terms of how local health care services are run. This is an important finding to note, as lower levels of satisfaction with services available locally can impact negatively on health care utilisation and health in general in the population. Harrison (2009) identified a need for improving the persistent inefficiencies in the management of the District Health System despite the approach itself being commendable as key to achieving good health outcomes.

Differences in perceptions were not found to be significant according to race in the current study. However, Myburgh, Solanki, Smith et al. (2005) found that perceptions and experiences with health care providers in South Africa were associated with the sources of inequities in health care; namely, racial group and socio-economic status. Whiteness and high economic status were associated with higher satisfaction with health care, while poor socio-economic status and being black African were associated with lower satisfaction. Low numbers of white and Indian respondents to questions on public perceptions on health care could explain the insignificant racial differences in perceptions. In South Africa, the legacy of apartheid continues to have a significant impact especially on health care access (Shisana 2013). Through extending health insurance coverage to all South Africans, the implementation of NHI will reduce racial disparities in health care services and service provision, and differences in satisfaction rates between racial groups should diminish.

Satisfaction with quality of care

Qualitative measures such as patients' perceptions on inpatient care, outpatient care, health services, and health care provision in their area of residence are important to patients' satisfaction with health services. The findings of the survey suggest that the majority of the South African population is satisfied with inpatient and outpatient care. However, satisfaction ratings among recent outpatients and inpatients were higher than those for health services in the area and health provision in the area; the latter two questions were asked not just of recent patients but of all study participants. This is in line with the suggestion that individuals who have recently used the health services are more likely to be satisfied with the service compared to those who have not any recent contact with the health system (McIntyre, Okorafor, Ataguba et al. 2008).

Patient satisfaction with aspects such as waiting times, being treated respectfully, clarity of explanations, involvement in decision-making, privacy provided, cleanliness of facilities, and availability of medicines and tests are also important for a fuller understanding of quality of care perceptions. Patients' perception that health care providers do not treat them fairly and respectfully can impact on health outcomes (Blanchard & Lurie 2004). Findings of high satisfaction are supported by a previous a study that found that between 75% and 90% of users of public hospital inpatient services reported being satisfied or very satisfied, depending on the aspect of quality of care and the hospital type (McIntyre, Okorafor, Ataguba et al. 2008). Similarly, the results of this study found between 76% and 90% of users of public and private inpatient or outpatient services were very satisfied or satisfied with quality of care aspects, or thought their experiences were very good or good. The results in the current study found that, consistently, a larger proportion of private users rated quality of care aspects as very good compared to public users.

These findings are similar to a previous study conducted by McIntyre, Okorafor, Ataguba et al. (2008) that found perceptions of private health facilities to be higher than perceptions of public health facilities. In the their study, they reported that users of private hospital inpatient care more frequently report being satisfied or very satisfied than public hospital users, with the differences being greater than in the case of outpatient services. Their respondents who had used a private sector service reported being either satisfied or very satisfied with each aspect of quality more frequently than users of public sector services. Interesting the same study noted that 'however, the differences in satisfaction levels between private and public sector users were not substantial with almost 91% of users of public clinics and community health centres were either satisfied or very satisfied with the cleanliness of the facility compared with almost 93% of users of private GPs' (McIntyre, Okorafor, Ataguba et al. 2008: 21).

Compliance with cleanliness in health facilities is important for the health of the patient, personnel and healthcare workers and should be monitored regularly. Compliance monitoring is conducted through internal government audits, primarily for assessing infection control. Assessing cleanliness includes 'the requirements for clean, safe and secure physical infrastructure (buildings, plant and machinery, equipment) and functional, well managed hotel services; and effective waste disposal' (Whittaker, Shaw, Spieker et al. 2011: 63). The WHO (2006) outlines the critical importance of clean health facilities for infection control, highlighting the fact that 90% of microorganisms are present within 'visible dirt'. They recommend that management provide cleaning supplies to enable routine cleaning of surfaces and fittings to ensure the health care environment is visibly clean and free from dust and soil (WHO 2002).

The finding in this study and the previous study by McIntyre, Okorafor, Ataguba et al. 2008 with regards to high level of satisfaction with health care services raises questions about the general belief and reports that suggest that there is a greater reported satisfaction with the private sector when compared to the public sector. As seen in the current study these difference are significant when it comes to the proportion of the population that was very satisfied or found their experience to be very good, but when very good and good are combined the differences between public and private experiences were small.

The majority of health care facility users are dependent on public health provision. Private health care services in the area may provide needed services but their utilisation is only accessible to those who can afford the costs. Interestingly in the study by McIntyre, Okorafor, Ataguba et al. (2008) approximately half of respondents (52%) felt that private health care is too expensive relative to what is received. This could explain why positive perceptions of private facilities are overall not much greater than perceptions of public facilities.

The study conducted by McIntyre, Okorafor, Ataguba et al. (2008) found that most respondent dissatisfaction was related to the waiting time, lack of confidentiality, privacy in consultations and respectful treatment by staff. It has been demonstrated that every extra hour of stay in an emergency department is associated with increased mortality and admission to hospital (Guttmann, Schull, Vermeulen et al. 2011, Pizer & Prentice 2011). A study conducted by Hardon, Akurut, Comoro et al. (2007) found that long waiting times, among other factors, are detrimental to optimal levels of ART adherence in Tanzania, Uganda, and Botswana. Psychological well-being can also be affected by long waiting times. Long waiting times have also been associated with a decrease inpatient satisfaction (VanDeusen Lukas, Meterko, Mohr et al. 2004). Long waiting times can also result in an increase of the use of hospital emergency rooms for non-urgent conditions (Cunningham, Clancy, Cohen et al., 1995; Shesser et al., 1991) which in turn increases the costs of health care (Hirvonen 2007). Waiting time for care is an important aspect of patients' satisfaction and a part of facilities management (Eilers 2004).

Comparatively, the results in this study suggest most respondent dissatisfaction was related to waiting time, as well as to involvement in decision-making, clarity of explanations given by health providers, and respectful treatment. However, respondent dissatisfaction was low compared to overall positive perceptions that services were very good or good. Actively involve patients in decision-making and their health care process can improve positive attitudes of health care works toward patients (Sonai 2012). The traditional role in which a health care worker holds absolute power over what is good or bad for a patient tends propagates negative attitudes towards patients (Longtin, Sax, Leape 2010), constructing them as powerless to influence positive change in their health. When health care providers inform patients and obtain their preferences regarding available treatment based on evidence, they can facilitate shared decision-making (SDM) in treatment. SDM entails clinicians and patients collectively making decisions about treatment using the best available evidence (Coulter, Parsons & Askham 2008; Stiggelbout, Van der Weijden, De Wit et al. 2012). Stiggelbout et al. (2012) demonstrate that SDM can even be used to address inequities if health practitioners involve educated patients in decision-making about their care to the same extent they include uneducated ones.

The high satisfaction ratings are contrary to recent findings about the poor quality of health services in South Africa. The recent 2012 National Health Care Facilities Baseline Audit evaluated 3 880 public health facilities (such as hospitals and clinics) in all nine provinces across the country according to the Department of Health's National Core Standards (NCS) for Health Establishments (Health Systems Trust 2012). This included an evaluation of health facilities according to the Minister of Health's six priority areas for patient-centred care. The audit found 68% compliance with standards for waiting times, only 30% compliance for standards related to positive and caring attitudes, 50% compliance for cleanliness, and 54% compliance with standards for availability of medicines and supplies (Health Systems Trust 2012). These ratings are extremely low compared to patient perceptions found in this study, as well as by McIntyre, Akorafor, Ataguba et al. (2008).

Discrepancies between positive public perceptions and low compliance with national standards for the quality of public health facilities could have various explanations. Public expectations could be lower than national standards for quality care set by health care experts. Furthermore, perceptions about quality of care in both private and public sectors are influenced by an array of actors, which include anecdotal stories often reported in the media and those told by relatives and, lastly, stories that circulate in the community (McIntyre, Akorafor, Ataguba et al. 2008).

Improving the quality of health care provision to address inequities and poor health outcomes for individual patients is part of ongoing government initiatives to improve and reform public health care. The 10 Point Plan for the improvement of the health sector (National Department of Health 2010) stipulates the commitment of government to improve the quality of health care through improving patient care and satisfaction in the public sector. With National Health Insurance evolving and the forthcoming institutionalisation of clearly defined roles of the private sector and subsequent arrangements with government, patient expectations should rise and perceptions about health care quality should remain positive, as they currently stand, or should even increase.

In conclusion, this survey found that the public service remains the core provider of health services in the country. Although there is room for improvement, there are a lot of positives that were observed with regards to accessing of health care services and satisfactions with the services provided within the public service. With regards to individual health, the results show that there is a lot still to be done to improve the health status of different age groups. The results point to a need to increase screening and prevention services to reduce the high rates of chronic diseases observed.

Conclusion issues:

- Good access in general – race and socio-economic status is still an issue; satisfaction is high – this should be used to promote public service and boost morale among health care workers.
- Free State has a high proportion the population that use private care
- Further investigation should be done about the Indian population, which has high rates of inpatient care and the use of outpatient facilities. Chronic conditions should be reported and seen as a reason to seek health care.
- NCD – better screening methods should be used to increase reporting by patients. Future studies can investigate this matter further.
- More older people have chronic conditions. Much can be done using prevention and early treatment. The situation should be monitored in an attempt to reduce admissions and multiple co-morbidities.
- Patterns of male utilisation should be target with prevention and primary care service to avoid more serious conditions.
- Females should be able to depend on health care services with the knowledge that they are satisfactory and respond to the needs of women as services are currently not as satisfactory as those for males.

3.11 Social and psychological determinants of tuberculosis

South Africa ranks third highest in generating new cases of tuberculosis (TB) in the world and it is one of the 22 high TB-burden countries that constitute about 80% of the global cases of TB (Finlay, Lancaster, Holtz et al. 2012). TB as an infectious disease poses a threat to population health in the country. The high rate of HIV/TB co-infection has also placed demands on the health care sector, especially in South Africa, which is responsible for 25% of all TB-HIV co-infections in the world (Shisana, Rehle, Simbayi et al. 2009). The prevention and treatment of TB is one of the key priorities of the National Department of Health (NDoH 2010). TB is a curable disease and requires strict and consistent adherence to TB treatment regimens.

There has been prolific biomedical research on TB, including examining disease pathways and effective medicines that can treat and cure those who have the infection. Despite these advances, TB prevalence in the country remains unacceptably high. The recognised role of social and psychological factors as determinants of acquiring TB infection and in curing the disease has been underestimated and understudied. SANHANES-1 addressed this gap by determining the knowledge of TB, attitudes towards the disease and self-reported adherence to TB treatment at a population level.

Examining the social and psychological factors associated with the onset of TB infection is vitally important because it will help to design behaviour change interventions for disease prevention, treatment adherence, and access to TB health care services. Surveys that ascertain knowledge, attitude, belief and practice (KABP), as was the case for the SANHANES-1 TB module, aim to understand how an individual's knowledge, combined with their attitudes and beliefs may predict their health behaviour (Katzenellenborgen, Joubert & Abdool Karim 1997).

In this module, we report on knowledge and awareness of TB, self-reported perceptions about being well-informed about TB, and attitudes and stigma towards TB among South African youth and adults.

3.11.1 Knowledge and awareness

An appropriate knowledge and awareness of TB and the fact that it is curable even in the presence of HIV remain vital messages that are required for effective TB control in South Africa (WHO 2009). These messages are particularly important when TB patients decide to utilise health services, seek a diagnosis and adhere to treatment (Naidoo, Dick & Cooper 2009). In addition, knowledge and awareness of TB as an infectious disease is the basis for individuals taking protective measures to avoid becoming infected. This knowledge is vital in assisting TB patients to make health-seeking decisions and subsequently adhere to treatment.

Opinions about the seriousness of TB

According to several theories of behavior change such as the Health Belief Model (Janz & Becker 1984), Theory of Reasoned Action (Fishbein & Azjen 1975), Theory of Planned Behavior (Azjen & Madden 1986) and the Transtheoretical/Stages of Change Model (Prochaska & DiClemente 1983), whether or not people adopt preventative behaviour depends on how serious they perceive the problem they wish to prevent to be.

Knowledge and awareness that TB is an infectious disease allows individuals to take protective measures to avoid becoming infected. This knowledge is vital in assisting TB patients to make health-seeking decisions and subsequent treatment adherence decisions. Hence respondents were asked to indicate whether they perceive TB to be a serious disease or not. A majority of respondents (91.4%) across sex, age, race and province perceived TB as a very serious disease (Table 3.11.1.1 and Figure 3.11.1.1). Younger people aged 15–24 years were significantly less likely (90.2%) to consider TB as very serious compared to older people aged 55–64 years, who perceived TB to very serious (93.9%). While people in all provinces considered TB to be a serious disease, there were significantly fewer people in Eastern Cape (85.5%) who held this opinion compared to those in KwaZulu-Natal (94.4%) and in Western Cape (95.2%). Across all population groups, TB is considered a serious disease. In urban formal areas more respondents (92.6%) thought TB was very serious as compared rural informal areas (89.1%).

Further, the urban/rural divide indicated that the urban formal areas (1.3%) did not consider TB to be a serious disease as compared to rural informal areas (3.3%). Provincial differences indicate that significantly more people in Eastern Cape (5.5%) did not consider TB to be serious than did so in Western Cape (0.9%), Free State (1.6%), KwaZulu-Natal (1.1%), Gauteng (1.3%), Limpopo (1.8%) and North West (1.5%). Significantly more black Africans (2.1%) thought TB was not a serious disease as compared to whites (0.4%).

When the data were disaggregated by sex, only provincial differences were found among the male respondents (for example, respondents from Western Cape and KwaZulu-Natal considered TB to be more serious as compared to those from Eastern Cape) and racial differences were similar to the combined results (Table 3.11.1.2). For females, the provincial differences were similar to those for males and, moreover, significantly more rural informal respondents (3.3%) thought TB is not a serious disease as compared to responendts from urban formal (1.1%) and urban informal (1.1%) areas (Table 3.11.1.3).

Figure 3.11.1.1: Perceptions of the seriousness of TB among participants aged 15 years and older, South Africa 2012

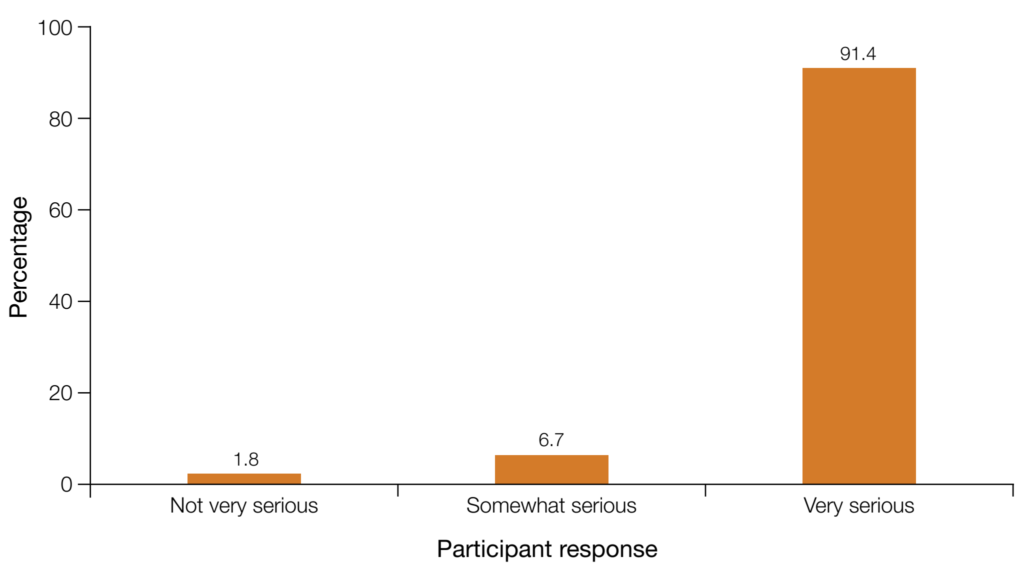


Table 3.11.1.1: Perceptions of seriousness of TB among all participants aged 15 years and older by sex, age, locality, province, and race, South Africa 2012

Background characteristics	In your opinion how serious a disease is TB?						
	Very serious		Somewhat serious		Not very serious		Total
	%	95% CI	%	95% CI	%	95% CI	n
Sex							
Male	91.0	[89.7–92.2]	7.0	[6.0–8.2]	2.0	[1.4–2.8]	6 087
Female	91.8	[90.7–92.8]	6.5	[5.6–7.5]	1.7	[1.3–2.2]	8 652
Total	91.4	[90.4–92.4]	6.7	[5.9–7.7]	1.8	[1.4–2.3]	14 739
Age							
15–24	90.2	[88.8–91.5]	7.7	[6.6–9.0]	2.1	[1.6–2.8]	4 131
25–34	91.7	[89.8–93.2]	6.7	[5.4–8.4]	1.6	[1.0–2.5]	2 914
35–44	92.1	[90.2–93.7]	5.8	[4.5–7.6]	2.0	[1.2–3.3]	2 423
45–54	91.7	[89.2–93.7]	6.9	[5.1–9.3]	1.3	[0.8–2.2]	2 206
55–64	93.9	[92.0–95.3]	4.4	[3.3–5.8]	1.7	[1.0–3.0]	1 687
65+	89.8	[87.0–92.0]	8.2	[6.1–11.0]	2.0	[1.3–3.0]	1 371
Total	91.4	[90.4–92.4]	6.7	[5.9–7.7]	1.8	[1.4–2.3]	14 732
Locality							
Urban formal	92.6	[91.2–93.7]	6.1	[5.1–7.4]	1.3	[0.9–1.9]	7 977
Urban informal	91.5	[88.7–93.7]	6.8	[4.8–9.5]	1.7	[1.1–2.5]	1 832
Rural formal	90.4	[85.4–93.8]	8.3	[5.2–13.0]	1.3	[0.5–3.1]	1 795
Rural informal	89.1	[86.8–91.1]	7.6	[6.1–9.4]	3.3	[2.4–4.5]	3 139
Total	91.4	[90.4–92.4]	6.7	[5.9–7.7]	1.8	[1.4–2.3]	14 743
Province							
Western Cape	95.2	[93.7–96.4]	3.9	[2.8–5.4]	0.9	[0.5–1.5]	2 097
Eastern Cape	85.5	[81.5–88.7]	9.0	[7.0–11.6]	5.5	[3.9–7.7]	1 576
Northern Cape	87.9	[80.7–92.6]	9.1	[5.9–13.9]	3.0	[1.4–6.5]	980
Free State	91.0	[88.0–93.3]	7.4	[5.1–10.7]	1.6	[0.8–3.1]	805
KwaZulu–Natal	94.4	[92.8–95.7]	4.5	[3.4–6.0]	1.1	[0.6–1.8]	2 453
North West	89.7	[85.9–92.5]	8.8	[6.2–12.3]	1.5	[0.6–3.8]	1 841
Gauteng	92.1	[89.8–93.9]	6.6	[4.9–8.9]	1.3	[0.6–2.5]	2 500
Mpumalanga	87.9	[81.1–92.4]	10.1	[5.9–16.6]	2.1	[1.0–4.1]	1 275
Limpopo	91.3	[88.0–93.7]	6.9	[4.7–10.2]	1.8	[1.0–3.1]	1 216
Total	91.4	[90.4–92.4]	6.7	[5.9–7.7]	1.8	[1.4–2.3]	14 743
Race							
African	91.0	[89.8–92.1]	6.9	[5.9–8.0]	2.1	[1.6–2.7]	9 778
White	93.4	[89.8–95.8]	6.2	[3.9–9.7]	0.4	[0.1–1.1]	683
Coloured	93.0	[91.4–94.4]	5.6	[4.4–7.1]	1.4	[0.9–2.1]	2 983
Asian/Indian	89.1	[84.6–92.4]	9.0	[5.7–13.9]	1.9	[1.0–3.5]	1 249
Total	91.4	[90.4–92.4]	6.7	[5.9–7.7]	1.8	[1.4–2.3]	14 693

95% CI: 95% confidence interval

Table 3.11.1.2: Perceptions of seriousness of TB among male participants by province and race, South Africa 2012

Background characteristics	In your opinion how serious a disease is TB?						
	Very serious		Somewhat serious		Not very serious		Total
	%	95% CI	%	95% CI	%	95% CI	n
Province							
Western Cape	95.4	[93.3–96.9]	4.0	[2.7–6.0]	0.5	[0.3–1.1]	883
Eastern Cape	84.3	[79.4–88.1]	10.0	[7.2–13.8]	5.7	[3.8–8.6]	664
Northern Cape	88.1	[77.2–94.1]	8.5	[4.9–14.6]	3.4	[0.9–11.5]	407
Free State	89.9	[85.9–92.9]	8.5	[5.4–13.1]	1.6	[0.6–4.7]	336
KwaZulu–Natal	94.3	[91.2–96.3]	5.0	[3.1–8.1]	0.7	[0.3–1.7]	1 033
North West	88.5	[84.1–91.9]	10.0	[7.0–13.9]	1.5	[0.5–4.8]	720
Gauteng	92.1	[89.6–94.1]	5.9	[4.3–8.2]	1.9	[0.8–4.4]	1 065
Mpumalanga	87.0	[77.1–93.0]	11.2	[5.5–21.4]	1.8	[0.7–4.7]	503
Limpopo	90.0	[85.1–93.5]	8.2	[5.2–12.5]	1.8	[0.8–4.0]	476
Total	91.0	[89.7–92.2]	7.0	[6.0–8.2]	2.0	[1.4–2.8]	6 087
Race							
African	90.5	[88.9–91.9]	7.2	[6.0–8.6]	2.3	[1.6–3.3]	3 958
White	93.5	[89.3–96.1]	6.3	[3.7–10.5]	0.2	[0.1–1.0]	309
Coloured	92.6	[90.4–94.4]	6.0	[4.5–7.9]	1.4	[0.8–2.5]	1 230
Asian/Indian	90.1	[83.1–94.4]	8.2	[4.3–15.1]	1.7	[0.8–3.7]	562
Total	91.0	[89.7–92.2]	7.0	[6.0–8.2]	2.0	[1.4–2.8]	6 059

95% CI: 95% confidence interval

Table 3.11.1.3: Perceptions of seriousness of TB among female participants by locality, and province, South Africa 2012

Background characteristics	In your opinion how serious a disease is TB?						
	Very serious		Somewhat serious		Not very serious		Total
	%	95% CI	%	95% CI	%	95% CI	n
Locality							
Urban formal	92.9	[91.5–94.1]	6.0	[4.8–7.4]	1.1	[0.8–1.6]	4 653
Urban informal	92.4	[88.9–94.8]	6.5	[4.2–9.9]	1.1	[0.6–2.1]	1 106
Rural formal	91.0	[85.6–94.5]	8.0	[4.8–13.3]	1.0	[0.3–2.7]	977
Rural informal	89.5	[86.9–91.7]	7.2	[5.6–9.3]	3.3	[2.2–4.7]	1 916
Total	91.8	[90.7–92.8]	6.5	[5.6–7.5]	1.7	[1.3–2.2]	8 652
Province							
Western Cape	95.1	[92.9–96.6]	3.7	[2.3–5.8]	1.3	[0.7–2.4]	1 214
Eastern Cape	86.6	[81.4–90.5]	8.1	[5.5–11.8]	5.3	[3.5–7.9]	909
Northern Cape	87.7	[81.5–92.0]	9.6	[6.3–14.6]	2.6	[1.2–5.5]	573
Free State	92.0	[88.1–94.7]	6.4	[3.9–10.3]	1.6	[0.7–3.4]	469
KwaZulu–Natal	94.5	[92.5–96.1]	4.1	[3.0–5.7]	1.4	[0.7–2.7]	1 420
North West	90.6	[86.5–93.6]	7.8	[5.2–11.7]	1.5	[0.6–3.6]	1 121
Gauteng	92.1	[89.4–94.1]	7.3	[5.3–10.1]	0.6	[0.3–1.4]	1 435
Mpumalanga	88.6	[83.2–92.5]	9.1	[5.8–13.9]	2.3	[1.2–4.4]	771
Limpopo	92.2	[89.3–94.4]	6.0	[3.9–9.2]	1.8	[0.9–3.6]	740
Total	91.8	[90.7–92.8]	6.5	[5.6–7.5]	1.7	[1.3–2.2]	8 652

95% CI: 95% confidence interval

Knowledge of the signs and symptoms of TB

Participants' knowledge of the signs and symptoms of TB was assessed. Twelve signs and symptoms of TB were listed in the adult survey questionnaire and respondents were asked to indicate the ones they knew. For ease of interpretation, the number of signs and symptoms known by each participant was recorded as a general measure of the knowledge about TB as an infectious disease, with the assumption that the more an individual knows about TB, the greater the likelihood that he or she will seek treatment and access health services when experiencing these signs and symptoms. It was also assumed that participants who were more knowledgeable about the signs and symptoms of TB would also know that TB is contagious and that if you have the disease and are in close proximity to others you run the risk of infecting them. The signs and symptoms specified in the questionnaire in this survey were as follows: rash, cough, cough that lasts longer than three weeks, coughing up blood, severe headache, nausea, weight loss, fever, fever without clear cause that lasts more than seven days, chest pain, shortness of breath, and ongoing fatigue.

Response scores were compiled from knowledge of one symptom to knowledge of six or more symptoms. The responses are tabulated in Table 3.11.1.4. Only 3.3% of the all participants identified six or more signs and symptoms of TB, 13.7% identified four or five signs and symptoms, 61.6% identified two or three signs and symptoms and 21.4% identified only one sign or symptom. The majority of participants were only able to identify between one and three symptoms of TB.

Significant differences found were the following: participants aged 25–34 (19.1%) and 35–44 (17.1%) had less knowledge about only one sign or symptom of TB compared to those aged 55–64 (25.5%) and 65 and over (26.4%); fewer participants residing in urban formal (18.9%) areas could identify one sign or symptom of TB in relation to their counterparts from rural informal (26.2%) areas; fewer participants from North West (13.7%) could identify one TB symptom than participants from Mpumalanga (30.4%), Limpopo (29.7%), KwaZulu-Natal (22.3%), Free State (29.2%), Eastern Cape (24.1%) and Western Cape (21.6%); black Africans (2.4%) could identify six or more signs and symptoms of TB than whites (8.5%) and Indians (8.5%); whites could identify six or more symptoms than coloureds (3.3%).

When the data were disaggregated by sex, the following significant differences were found: more male participants in the age categories 45–54 (25.9%), 55–64 (26.5%), and 65 years and above (26.6%) could identify one sign or symptom of TB than males aged 35–44 years (Table 3.11.1.5). With regard to the provinces, fewer males from Free State (8.5%) could identify four or five signs or symptoms of TB compared to males from the North West (17.3%). However, males from Mpumalanga (30.0%), Limpopo (31.0%) and Free State (32.1%) were more likely to identify one sign or symptom of TB than those from North West (14.6%). Indian (7.2%) and white (5.8%) males were more likely to identify six or more signs or symptoms of TB in comparison to African males (2.3%). In addition, fewer Limpopo residents (5.8%) could identify four or five symptoms of TB as compared to residents from Gauteng (13.8%), North West (17.3%), KwaZulu-Natal (11.9%), Northern Cape (14%) and Western Cape (16.2%).

The following differences were found for female respondents: fewer urban formal (18.2%) participants than rural informal (25.4%) participants could identify only one symptom of TB; further provincial differences were found with respect to identifying two and more symptoms of TB; and finally, fewer black African females (2.6%) could identify six or more symptoms of TB than whites (10.9%) and Indians (9.8%) (Table 3.11.1.6).

Table 3.11.1.4: Knowledge of signs and symptoms of TB among all participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	What are the signs and symptoms of TB?								
	Identified 6 or more signs/symptoms		Identified 4 to 5 signs/ symptoms		Identified 2 to 3 signs/ symptoms		Identified 1 sign/symptom		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex									
Male	2.8	[2.1–3.7]	12.7	[10.7–15.1]	62.2	[59.3–65.1]	22.3	[20.0–24.7]	6 272
Female	3.7	[2.9–4.8]	14.6	[13.2–16.1]	61.0	[58.5–63.4]	20.7	[18.5–23.0]	8 868
Total	3.3	[2.6–4.1]	13.7	[12.3–15.3]	61.6	[59.2–63.9]	21.4	[19.4–23.6]	15 140
Age									
15–24	2.4	[1.8–3.3]	13.1	[11.3–15.1]	61.5	[58.2–64.7]	23.0	[20.3–26.0]	4 274
25–34	3.7	[2.6–5.2]	13.9	[11.9–16.1]	63.4	[60.4–66.3]	19.1	[16.7–21.7]	2 984
35–44	3.4	[2.4–4.8]	16.0	[13.3–19.3]	63.5	[60.2–66.7]	17.1	[14.9–19.5]	2 482
45–54	3.8	[2.5–5.7]	13.6	[11.6–15.8]	59.5	[54.7–64.0]	23.2	[19.3–27.5]	2 262
55–64	3.7	[2.5–5.4]	12.3	[9.6–15.5]	58.6	[54.7–62.3]	25.5	[22.0–29.3]	1 730
65+	3.7	[2.3–5.9]	11.7	[8.6–15.6]	58.2	[53.4–62.9]	26.4	[22.8–30.4]	1 403
Total	3.3	[2.6–4.1]	13.7	[12.3–15.3]	61.6	[59.2–63.9]	21.4	[19.4–23.6]	15 135
Locality									
Urban formal	4.1	[3.0–5.5]	14.4	[12.1–17.0]	62.7	[58.9–66.3]	18.9	[15.9–22.2]	8 189
Urban informal	1.8	[1.0–3.1]	15.1	[12.4–18.2]	61.3	[57.1–65.2]	21.9	[18.0–26.4]	1 884
Rural formal	2.6	[1.4–4.7]	14.5	[10.9–19.1]	58.7	[53.7–63.5]	24.3	[17.8–32.2]	1 844
Rural informal	2.3	[1.5–3.6]	11.4	[9.7–13.5]	60.1	[57.2–62.9]	26.2	[23.2–29.4]	3 229
Total	3.3	[2.6–4.1]	13.7	[12.3–15.3]	61.6	[59.2–63.9]	21.4	[19.4–23.6]	15 146
Province									
Western Cape	3.1	[2.1–4.7]	16.7	[14.1–19.8]	58.5	[54.5–62.4]	21.6	[18.2–25.5]	2 115
Eastern Cape	2.6	[1.5–4.5]	11.6	[8.5–15.6]	61.7	[56.1–67.1]	24.1	[18.9–30.2]	1 613
Northern Cape	7.1	[4.0–12.5]	13.2	[9.6–18.0]	55.8	[47.6–63.6]	23.9	[17.0–32.6]	994
Free State	1.8	[0.6–5.0]	11.4	[7.7–16.4]	57.6	[47.7–66.9]	29.2	[19.0–42.1]	815
KwaZulu–Natal	2.6	[1.7–4.1]	13.2	[10.8–16.0]	61.9	[58.2–65.4]	22.3	[18.3–26.8]	2 509
North West	4.6	[2.7–7.8]	16.7	[14.0–19.9]	64.9	[60.4–69.2]	13.7	[10.4–18.0]	1 906
Gauteng	3.9	[2.3–6.5]	14.5	[10.9–18.9]	64.7	[58.7–70.2]	16.9	[12.8–22.1]	2 612
Mpumalanga	3.2	[1.7–6.2]	14.2	[9.8–20.2]	52.1	[44.5–59.7]	30.4	[23.7–38.2]	1 330
Limpopo	2.0	[1.0–3.8]	9.3	[7.1–12.1]	59.1	[55.2–62.8]	29.7	[26.1–33.5]	1 252
Total	**3.3**	**[2.6–4.1]**	**13.7**	**[12.3–15.3]**	**61.6**	**[59.2–63.9]**	**21.4**	**[19.4–23.6]**	**15 146**
Race									
African	2.4	[1.8–3.2]	12.8	[11.2–14.6]	62.3	[59.5–64.9]	22.5	[20.1–25.1]	10 085
White	8.5	[5.1–13.9]	18.3	[13.9–23.7]	56.6	[48.9–63.9]	16.6	[11.9–22.8]	695
Coloured	3.3	[2.1–5.0]	15.8	[13.2–18.9]	61.4	[57.8–64.9]	19.5	[16.5–22.9]	3 022
Asian/Indian	8.5	[5.4–13.2]	15.1	[11.7–19.3]	61.8	[55.9–67.5]	14.5	[8.3–24.3]	1 292
Total	3.3	[2.6–4.1]	13.7	[12.3–15.3]	61.6	[59.2–63.9]	21.4	[19.4–23.6]	15 094

95% CI: 95% confidence interval

Table 3.11.1.5: Knowledge of signs and symptoms of TB among male participants by age, province, and race, South Africa 2012

Background characteristics	Identified 6 or more signs/symptoms		Identified 4 to 5 signs/ symptoms		Identified 2 to 3 signs/ symptoms		Identified 1 sign/symptom		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age									
15–24	1.8	[1.2–2.7]	11.9	[9.7–14.6]	62.8	[58.7–66.7]	23.5	[20.3–26.9]	1 969
25–34	3.2	[2.0–5.1]	12.5	[9.9–15.8]	63.3	[59.3–67.1]	21.0	[17.9–24.4]	1 248
35–44	2.7	[1.5–4.8]	14.9	[10.7–20.3]	65.8	[60.0–71.2]	16.6	[13.6–20.2]	961
45–54	3.7	[2.0–6.5]	13.6	[10.8–17.0]	56.9	[50.5–63.0]	25.9	[20.5–32.1]	893
55–64	3.3	[2.0–5.5]	10.1	[7.1–14.2]	60.1	[53.8–66.1]	26.5	[21.4–32.3]	719
65+	3.4	[1.5–7.7]	12.3	[7.4–19.9]	57.6	[49.8–65.1]	26.6	[21.1–33.0]	477
Total	2.8	[2.1–3.7]	12.7	[10.7–15.1]	62.2	[59.3–65.1]	22.3	[20.0–24.7]	6 267
Province									
Western Cape	2.6	[1.4–4.7]	16.2	[12.2–21.1]	58.8	[52.7–64.8]	22.4	[17.7–27.9]	893
Eastern Cape	2.7	[1.4–5.2]	10.9	[7.1–16.5]	61.9	[54.2–69.0]	24.4	[18.4–31.7]	680
Northern Cape	5.8	[2.8–11.6]	14.0	[9.4–20.4]	53.9	[44.9–62.7]	26.3	[17.5–37.6]	413
Free State	1.2	[0.4–3.3]	8.5	[5.4–13.2]	58.2	[46.8–68.8]	32.1	[20.5–46.4]	342
KwaZulu–Natal	2.4	[1.5–3.7]	11.9	[9.3–15.0]	62.8	[57.6–67.6]	23.0	[18.4–28.3]	1 059
North West	4.2	[2.4–7.3]	17.3	[13.3–22.1]	63.9	[58.3–69.0]	14.6	[10.4–20.1]	748
Gauteng	3.0	[1.6–5.6]	13.8	[9.0–20.6]	65.1	[58.0–71.5]	18.1	[13.7–23.5]	1 117
Mpumalanga	2.0	[0.9–4.5]	12.4	[8.1–18.4]	55.6	[46.5–64.4]	30.0	[22.4–39.0]	529
Limpopo	2.1	[0.9–4.6]	5.8	[4.0–8.4]	61.0	[55.8–66.0]	31.0	[26.6–35.9]	491
Total	2.8	[2.1–3.7]	12.7	[10.7–15.1]	62.2	[59.3–65.1]	22.3	[20.0–24.7]	6 272
Race									
African	2.3	[1.6–3.2]	11.8	[9.4–14.7]	62.3	[58.9–65.6]	23.7	[20.9–26.7]	4 093
White	5.8	[3.3–10.2]	17.6	[12.3–24.7]	61.7	[51.4–71.1]	14.8	[9.5–22.2]	317
Coloured	2.5	[1.4–4.5]	14.8	[11.1–19.5]	61.9	[56.7–66.8]	20.8	[16.9–25.3]	1 247
Asian/Indian	7.2	[4.3–11.7]	13.5	[9.1–19.5]	63.2	[54.6–71.0]	16.2	[7.9–30.3]	586
Total	2.8	[2.1–3.7]	12.7	[10.7–15.1]	62.2	[59.3–65.1]	22.3	[20.0–24.7]	6 243

95% CI: 95% confidence interval

Table 3.11.1.6: Knowledge of signs and symptoms of TB among female participants by locality, province, and race, South Africa 2012

Background characteristics	Identified 6 or more signs/symptoms		Identified 4 to 5 signs/ symptoms		Identified 2 to 3 signs/ symptoms		Identified 1 sign/symptom		Total
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Locality									
Urban formal	4.7	[3.4–6.5]	15.2	[13.2–17.5]	61.9	[57.9–65.7]	18.2	[15.0–21.8]	4 756
Urban informal	2.1	[1.1–3.9]	15.7	[12.8–19.3]	62.0	[57.9–66.0]	20.1	[16.0–25.0]	1 135
Rural formal	2.3	[1.0–5.5]	16.3	[12.4–21.2]	57.9	[51.8–63.7]	23.4	[16.2–32.7]	1 007
Rural informal	2.6	[1.6–4.2]	12.4	[10.4–14.8]	59.6	[56.4–62.7]	25.4	[22.2–28.9]	1 970
Total	3.7	[2.9–4.8]	14.6	[13.2–16.1]	61.0	[58.5–63.4]	20.7	[18.5–23.0]	8 868
Province									
Western Cape	3.6	[2.2–5.8]	17.2	[13.8–21.3]	58.3	[53.6–62.8]	21.0	[17.4–25.0]	1 222
Eastern Cape	2.5	[1.3–4.5]	12.2	[8.8–16.7]	61.6	[56.5–66.4]	23.8	[18.5–29.9]	929
Northern Cape	8.4	[4.5–15.3]	12.5	[8.4–18.1]	57.5	[48.7–65.9]	21.6	[15.9–28.7]	581
Free State	2.4	[0.6–8.6]	14.1	[9.0–21.6]	57.0	[46.9–66.5]	26.5	[16.6–39.5]	473
KwaZulu–Natal	2.8	[1.6–5.0]	14.2	[10.9–18.3]	61.2	[56.4–65.8]	21.7	[17.0–27.3]	1 450
North West	4.9	[2.6–9.1]	16.3	[13.5–19.5]	65.8	[60.6–70.7]	13.0	[9.7–17.2]	1 158
Gauteng	4.8	[2.8–8.1]	15.1	[12.2–18.5]	64.3	[57.9–70.1]	15.9	[11.2–21.9]	1 494
Mpumalanga	4.3	[2.2–8.3]	15.8	[10.8–22.3]	49.2	[41.7–56.8]	30.8	[24.1–38.3]	800
Limpopo	1.9	[0.9–3.9]	12.0	[9.0–15.7]	57.5	[52.8–62.1]	28.6	[24.0–33.7]	761
Total	3.7	[2.9–4.8]	14.6	[13.2–16.1]	61.0	[58.5–63.4]	20.7	[18.5–23.0]	8 868
Race									
African	2.6	[1.9–3.4]	13.7	[12.3–15.3]	62.3	[59.4–65.0]	21.5	[19.0–24.2]	5 989
White	10.9	[5.9–19.2]	18.9	[13.8–25.4]	52.0	[43.4–60.5]	18.2	[11.8–27.0]	378
Coloured	3.9	[2.6–6.0]	16.7	[13.6–20.5]	61.0	[56.6–65.1]	18.4	[15.3–21.8]	1 774
Asian/Indian	9.8	[5.9–15.9]	16.8	[13.0–21.3]	60.5	[54.8–65.9]	12.9	[8.5–19.2]	706
Total	3.7	[2.9–4.8]	14.6	[13.2–16.1]	61.0	[58.5–63.4]	20.7	[18.5–23.0]	8 847

95% CI: 95% confidence interval

Knowledge that TB is a curable disease

Overall more than 92% of all participants knew that TB can be cured, while the remaining 8% was almost evenly split between those who knew that TB could not be cured (4.2%) and those who were unsure whether TB could be cured (3.6%) (Table 3.11.1.7 and Figure 3.11.1.2). This trend was consistent across sex, age, locality, province and race. However, a significantly larger proportion of respondents, male and female, more than 65 years of age (7.8%) did not know whether TB could be cured compared to those aged 15–24 years (3.3%).

While not significant, slightly more males (4.5%) than females (3.9%) thought that TB was incurable. Similarly, only slightly more males (3.9%) than females (3.4%) did not know whether TB could be cured. A significant proportion of respondents from rural informal, (6.0%), did not know whether TB could be cured compared to respondents from formal urban areas (2.4%). This observation, in terms of areas in which respondents live, was also significant when disaggregated by participants' sex (Table 3.11.1.8 and Table 3.11.1.9).

Of all provinces, Western Cape had the largest proportion of respondents (96.4%) who believed that TB was curable. Of all provinces Gauteng had the largest proportion of respondents (6.3%) who thought that TB was incurable, followed by Mpumalanga (5.9%) and Free State (3.8%). However, the finding for Gauteng should be treated with caution due to the large amount of uncertainty about this estimate and that this proportion may not be representative of the general population of Gauteng.

Of all race groups, a significantly larger proportion of whites (97.7%) compared to black Africans (91%) knew that TB was curable. A significant number of black Africans (4.3%) compared to coloureds (1.7%) and whites (0.5%) were not sure whether TB could be cured.

Figure 3.11.1.2: Knowledge of TB being curable among participants aged 15 years and older, South Africa 2012

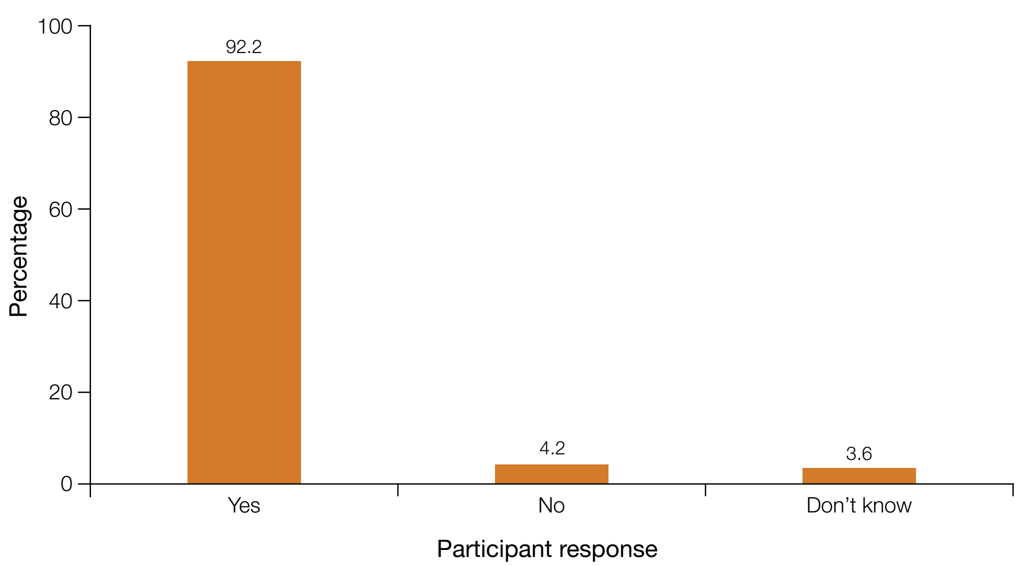


Table 3.11.1.7: Knowledge of TB being curable among all participants aged 15 years and older by sex, age, locality, province and race, South Africa 2012

Background characteristics	Yes		No		Don't know		Total
	%	95% CI	%	95% CI	%	95% CI	n
Sex							
Male	91.6	[90.0–93.1]	4.5	[3.4–5.8]	3.9	[3.1–4.9]	6 173
Female	92.6	[91.0–94.0]	3.9	[2.9–5.4]	3.4	[2.7–4.2]	8 730
Total	92.2	[90.7–93.4]	4.2	[3.2–5.5]	3.6	[3.1–4.3]	14 903
Age							
15–24	91.9	[89.8–93.6]	4.8	[3.4–6.6]	3.3	[2.6–4.3]	4 214
25–34	92.6	[90.7–94.1]	3.6	[2.5–5.1]	3.9	[2.9–5.1]	2 940
35–44	93.2	[91.1–94.8]	3.7	[2.6–5.1]	3.2	[2.2–4.6]	2 446
45–54	92.6	[90.0–94.6]	5.1	[3.3–7.6]	2.3	[1.7–3.3]	2 226
55–64	92.7	[90.7–94.4]	3.6	[2.4–5.4]	3.7	[2.7–4.9]	1 699
65+	87.8	[84.8–90.3]	4.4	[2.7–7.2]	7.8	[6.0–10.1]	1 373
Total	92.2	[90.7–93.4]	4.2	[3.2–5.5]	3.6	[3.1–4.3]	14 898
Locality							
Urban formal	92.9	[90.3–94.8]	4.7	[3.1–7.1]	2.4	[1.7–3.4]	8 051
Urban informal	92.8	[90.2–94.7]	3.8	[2.5–5.8]	3.4	[2.2–5.1]	1 860
Rural formal	90.7	[87.3–93.2]	3.9	[2.4–6.3]	5.4	[3.4–8.5]	1 811
Rural informal	90.7	[89.1–92.1]	3.3	[2.6–4.1]	6.0	[4.8–7.6]	3 187
Total	92.2	[90.7–93.4]	4.2	[3.2–5.5]	3.6	[3.1–4.3]	14 909
Province							
Western Cape	96.4	[94.8–97.6]	2.5	[1.6–4.0]	1.1	[0.7–1.6]	2 096
Eastern Cape	89.5	[86.0–92.2]	3.1	[2.0–4.8]	7.4	[5.1–10.7]	1 590
Northern Cape	93.5	[86.3–97.0]	2.0	[0.9–4.7]	4.5	[1.5–12.5]	982
Free State	91.4	[87.9–93.9]	3.8	[2.4–5.8]	4.8	[2.6–8.8]	810
KwaZulu–Natal	93.8	[91.5–95.6]	3.1	[1.9–4.9]	3.1	[2.1–4.4]	2 470
North West	93.3	[90.3–95.4]	3.0	[1.4–6.1]	3.7	[2.5–5.6]	1 875
Gauteng	91.2	[86.7–94.3]	6.3	[3.7–10.4]	2.5	[1.5–4.3]	2 550
Mpumalanga	89.7	[85.6–92.7]	5.9	[3.2–10.7]	4.4	[2.8–7.0]	1 303
Limpopo	91.5	[89.4–93.2]	2.9	[2.2–3.9]	5.6	[4.1–7.6]	1 233
Total	92.2	[90.7–93.4]	4.2	[3.2–5.5]	3.6	[3.1–4.3]	14 909
Race							
African	91.0	[89.2–92.5]	4.8	[3.5–6.4]	4.3	[3.5–5.1]	9 932
White	97.7	[95.6–98.8]	1.8	[0.8–3.9]	0.5	[0.2–1.3]	679
Coloured	95.9	[94.1–97.2]	2.4	[1.4–4.2]	1.7	[1.1–2.4]	2 983
Asian/Indian	92.8	[89.6–95.1]	2.4	[1.0–5.4]	4.8	[3.0–7.7]	1 264
Total	92.2	[90.7–93.4]	4.2	[3.2–5.5]	3.6	[3.1–4.3]	14 858

95% CI: 95% confidence interval

Table 3.11.1.8: Knowledge of TB being curable among male participants by locality, province and race, South Africa 2012

Background characteristics	Yes		No		Don't know		Total
	%	95% CI	%	95% CI	%	95% CI	n
Locality							
Urban formal	92.6	[89.8–94.7]	4.9	[3.2–7.3]	2.5	[1.6–4.0]	3 376
Urban informal	91.1	[87.9–93.5]	5.2	[3.6–7.5]	3.7	[2.3–6.1]	735
Rural formal	90.1	[86.4–92.8]	3.5	[2.0–6.1]	6.4	[3.9–10.2]	824
Rural informal	90.1	[87.9–91.9]	3.5	[2.6–4.7]	6.5	[4.9–8.5]	1 238
Total	91.6	[90.0–93.1]	4.5	[3.4–5.8]	3.9	[3.1–4.9]	6 173
Province							
Western Cape	95.2	[92.3–97.0]	2.9	[1.5–5.5]	2.0	[1.2–3.1]	890
Eastern Cape	88.4	[84.1–91.6]	3.2	[1.9–5.1]	8.5	[5.7–12.4]	670
Northern Cape	92.7	[80.3–97.6]	1.7	[0.8–3.8]	5.5	[1.3–20.1]	404
Free State	90.5	[85.3–94.0]	3.9	[2.4–6.2]	5.6	[2.6–12.0]	338
KwaZulu–Natal	93.3	[90.4–95.4]	3.8	[2.4–6.1]	2.8	[1.7–4.7]	1 042
North West	94.2	[90.4–96.5]	3.0	[1.2–7.2]	2.9	[1.8–4.5]	737
Gauteng	91.1	[86.3–94.3]	6.2	[3.7–10.3]	2.7	[1.4–5.3]	1 093
Mpumalanga	88.3	[83.7–91.8]	6.3	[3.3–11.6]	5.4	[3.0–9.4]	513
Limpopo	90.9	[87.7–93.3]	3.5	[2.2–5.5]	5.7	[3.8–8.3]	486
Total	91.6	[90.0–93.1]	4.5	[3.4–5.8]	3.9	[3.1–4.9]	6 173
Race							
African	90.4	[88.3–92.1]	5.0	[3.7–6.7]	4.6	[3.6–5.8]	4 030
White	97.3	[94.1–98.8]	2.2	[0.8–5.6]	0.5	[0.1–1.7]	311
Coloured	95.2	[93.2–96.6]	2.5	[1.5–4.2]	2.3	[1.5–3.5]	1 235
Asian/Indian	94.9	[89.8–97.5]	3.4	[1.3–8.6]	1.7	[0.8–3.8]	569
Total	91.6	[90.0–93.1]	4.5	[3.4–5.8]	3.9	[3.1–4.9]	6 145

95% CI: 95% confidence interval

Table 3.11.1.9: Knowledge of TB being curable among female participants, by locality, province and race, South Africa 2012

Background characteristics	Yes		No		Don't know		Total
	%	95% CI	%	95% CI	%	95% CI	n
Locality							
Urban formal	93.2	[90.4–95.2]	4.5	[2.8–7.1]	2.3	[1.5–3.6]	4 673
Urban informal	94.2	[90.8–96.5]	2.7	[1.2–5.8]	3.1	[1.8–5.3]	1 124
Rural formal	91.3	[87.5–94.0]	4.3	[2.5–7.3]	4.3	[2.6–7.3]	987
Rural informal	91.2	[89.4–92.8]	3.1	[2.3–4.2]	5.7	[4.4–7.4]	1 946
Total	92.6	[91.0–94.0]	3.9	[2.9–5.4]	3.4	[2.7–4.2]	8 730

Province							
Western Cape	97.6	[96.0–98.5]	2.2	[1.2–3.8]	0.3	[0.1–0.6]	1 206
Eastern Cape	90.5	[86.5–93.4]	3.1	[1.6–5.7]	6.4	[4.1–9.8]	916
Northern Cape	94.2	[88.7–97.1]	2.3	[0.6–8.0]	3.5	[1.6–7.7]	578
Free State	92.3	[89.2–94.5]	3.7	[2.1–6.4]	4.1	[2.6–6.4]	472
KwaZulu–Natal	94.3	[91.8–96.0]	2.5	[1.4–4.4]	3.2	[2.1–4.9]	1 428
North West	92.6	[89.4–94.9]	3.0	[1.6–5.6]	4.5	[2.6–7.4]	1 138
Gauteng	91.3	[86.2–94.7]	6.3	[3.5–11.0]	2.4	[1.1–4.9]	1 456
Mpumalanga	90.8	[86.1–94.0]	5.6	[2.9–10.5]	3.6	[2.0–6.4]	789
Limpopo	91.9	[89.2–94.0]	2.5	[1.5–4.3]	5.6	[3.9–7.9]	747
Total	92.6	[91.0–94.0]	3.9	[2.9–5.4]	3.4	[2.7–4.2]	8 730
Race							
African	91.5	[89.6–93.1]	4.6	[3.3–6.3]	3.9	[3.1–5.0]	5 899
White	98.0	[95.5–99.1]	1.4	[0.5–4.0]	0.6	[0.2–1.8]	368
Coloured	96.6	[94.3–98.0]	2.3	[1.2–4.7]	1.0	[0.5–2.2]	1 747
Asian/Indian	90.8	[85.8–94.1]	1.4	[0.6–3.0]	7.8	[4.5–13.3]	695
Total	92.6	[91.0–94.0]	3.9	[2.9–5.4]	3.4	[2.7–4.2]	8 709

95% CI: 95% confidence interval

Perceptions of comorbidity between TB and HIV

Given that in South Africa there is a high level of co-morbidity between TB and HIV, that TB in people living with HIV exacerbates the HIV-infection, and that living with HIV increases your risk of becoming infected with TB, it is important that the general population is aware of these facts in order to seek diagnosis and treatment as early as possible. However, there are common misconceptions that all people infected with TB are co-infected with HIV, which may increase stigma around both TB and HIV. This survey examined the level of knowledge of TB and HIV co-morbidity.

Table 3.11.1.10 shows the level of knowledge of TB and HIV co-morbidity. About two-thirds of respondents (67.3%) did not perceive that individuals with TB are also HIV-positive. When disaggregated by age, significantly more of those who aged 15–24 years (70.7%) and 25–34 years (68.3%) perceived that individuals with TB are also not HIV-positive than those aged 65 years and older (58.8%) and significantly more of participants aged 15–24 years also did so than those aged 55–64 years (62.5%). As for locality, significantly more of those in urban formal areas (72.2%) did not perceive infection with TB to also mean HIV-infection than those in rural informal areas (58.2%).

When disaggregated by province, a significantly higher propotion of Western Cape residents (78.7%) did not express a concern for HIV presence among people with TB than in five of the provinces (range 55.9% to 62.1%), with the exception of Northern Cape, North West and Gauteng residents.

When race groups were considered, significantly more respondents among both whites (78.0%) and coloureds (72.0%) did not express a concern for TB presence among people living with HIV when compared to Indians (57.4%).

Table 3.11.1.10: Expression of concern for TB presence in HIV positive individuals among all participants by sex, age, locality, province and race, South Africa 2012

Background characteristics	Yes		No		Don't know		Total
	%	95% CI	%	95% CI	%	95% CI	n
Sex							
Male	22.0	[19.5–24.7]	67.6	[64.7–70.4]	10.4	[9.0–12.0]	6 094
Female	22.7	[20.3–25.2]	67.1	[64.2–69.8]	10.3	[9.0–11.8]	8 570
Total	22.3	[20.1–24.7]	67.3	[64.7–69.8]	10.3	[9.1–11.7]	14 664
Age							
15–24	20.3	[18.0–22.9]	70.7	[67.7–73.4]	9.0	[7.7–10.5]	4 151
25–34	23.8	[20.3–27.7]	68.3	[64.2–72.2]	7.8	[6.2–9.8]	2 883
35–44	25.3	[22.2–28.6]	65.9	[62.1–69.5]	8.8	[7.1–10.9]	2 407
45–54	21.1	[18.1–24.5]	68.5	[64.9–71.9]	10.3	[8.5–12.6]	2 187
55–64	24.3	[20.6–28.4]	62.5	[57.6–67.2]	13.2	[10.7–16.2]	1 677
65+	17.2	[14.3–20.5]	58.8	[53.5–63.9]	24.0	[19.8–28.9]	1 354
Total	22.3	[20.1–24.7]	67.3	[64.7–69.8]	10.3	[9.1–11.7]	14 659
Locality							
Urban formal	21.0	[17.7–24.8]	72.2	[68.3–75.8]	6.8	[5.5–8.3]	7 934
Urban informal	24.1	[19.0–30.0]	67.8	[62.0–73.0]	8.2	[6.1–10.9]	1 812
Rural formal	24.7	[20.1–30.0]	60.8	[54.9–66.3]	14.5	[10.0–20.7]	1 785
Rural informal	23.9	[20.7–27.5]	58.2	[53.8–62.4]	17.9	[15.3–20.8]	3 139
Total	22.3	[20.1–24.7]	67.3	[64.7–69.8]	10.3	[9.1–11.7]	14 670
Province							
Western Cape	15.8	[12.8–19.2]	78.7	[74.5–82.3]	5.6	[4.2–7.4]	2 062
Eastern Cape	20.1	[15.5–25.6]	62.1	[55.1–68.7]	17.8	[13.6–23.0]	1 560
Northern Cape	21.1	[15.8–27.7]	68.7	[61.4–75.2]	10.2	[6.0–16.8]	973
Free State	22.9	[18.7–27.7]	58.0	[53.4–62.5]	19.1	[15.2–23.9]	801
KwaZulu–Natal	30.4	[25.8–35.3]	55.9	[50.0–61.8]	13.7	[10.7–17.3]	2 419
North West	21.3	[16.3–27.4]	72.1	[65.6–77.9]	6.5	[4.2–10.1]	1 842
Gauteng	21.4	[16.1–27.8]	74.0	[67.6–79.5]	4.6	[3.2–6.6]	2 514
Mpumalanga	27.7	[19.8–37.3]	62.7	[52.5–71.8]	9.6	[6.9–13.4]	1 264
Limpopo	20.8	[17.8–24.1]	58.8	[54.3–63.2]	20.4	[16.2–25.4]	1 235
Total	22.3	[20.1–24.7]	67.3	[64.7–69.8]	10.3	[9.1–11.7]	14 670
Race							
African	22.9	[20.4–25.7]	65.9	[62.8–68.9]	11.2	[9.7–12.8]	9 742
White	18.3	[11.6–27.8]	76.0	[67.2–83.0]	5.7	[3.3–9.5]	683
Coloured	19.9	[16.3–24.1]	72.0	[67.6–75.9]	8.1	[6.5–10.1]	2 942
Asian/Indian	31.3	[26.2–36.8]	57.4	[50.8–63.7]	11.3	[7.7–16.4]	1 255
Total	22.3	[20.1–24.7]	67.3	[64.7–69.8]	10.3	[9.1–11.7]	14 622

95% CI: 95% confidence interval

HIV testing for individuals with TB: Perceptions of co-morbidity

When TB and an HIV-infection occurs together in the same person then both diseases should be treated. TB patients should be offered an HIV test in order to determine the optimal package for long-term treatment and care. Because HIV is worsened by an underlying TB infection and progresses more rapidly to AIDS if left untreated, people living with HIV should also be offered TB testing. In addition, people who recover from active TB disease are more likely to have recurrent episodes of TB if they also have HIV.

Table 3.11.1.11 shows participants' knowledge of the importance of testing for HIV if one is infected with TB. When asked if people with TB should be tested for HIV, a large proportion of the participants (81.0%) concurred with the proposition. There was no difference found between the two sexes. When disaggregated by age, the elderly aged 65 years and older were found to have significantly lower levels of understanding about the issue (69.8%) compared to all other age groups as a significantly larger proportion of the elderly (20.7%) also indicated that they did not know if people with TB should be tested for HIV when compared to all other age groups. Concerning locality type, significantly fewer of those from rural informal (tribal) areas (73.1%) concurred that people with TB should also be tested for HIV compared to urban formal (83.7%), urban informal (81.8%) and formal rural (farms) (84.8%).

When provinces were compared, residents from Western Cape had the highest level of understanding (91.1%), followed by those from Northern Cape (89.3%), Mpumalanga (87.6%), Gauteng (84.9%) and KwaZulu-Natal (81.7%), and they all had significantly higher knowledge than the remaining four provinces, Limpopo (which had the lowest level of understanding at 68.5%), followed by Eastern Cape (73.2%), North West (73.7%), and finally, Free State (75.4%). Residents from both Western Cape and Mpumalanga also had significantly higher levels of understanding than those from KwaZulu-Natal.

When it came to race, black Africans (78.9%) had a significantly lower level of understanding about the importance of HIV-testing for people infected with TB than both whites (89.5%), and coloureds (87.8%).

3.11.2 Perceived TB literacy

An individual's level of health literacy is key to seeking health services when he or she feels ill and experiences symptoms that might be an indication of underlying disease (Sudore, Yaffe, Satterfield et al. 2006). Individuals acquire knowledge about disease conditions through various means, such as the media, internet, personal experience, health practitioners and many others.

A majority of respondents (63.2%) reported perceiving themselves to be well-informed about TB (Table 3.11.2.1). There were no significant differences found between sexes. Regarding age, significantly more respondents aged 35–44 years (66.4%) reported being well-informed about TB than the elderly group aged 65 years and older (56.3%). When comparisons across localities were made, significantly fewer respondents residing in rural informal (51.9%) areas and urban informal (58.6%) areas reported being well-informed than those from urban formal (69.4%) and rural formal areas (68.0%). With regards to provinces, Eastern Cape had the lowest proportion of people who reported being well-informed about TB (46.8%), and was significantly lower than KwaZulu-Natal (60.8%), Eastern Cape (46.8%), Western Cape (67%) and Gauteng (68.7%). Eastern Cape and Limpopo (51.5%) had significantly lower levels of self-reported knowledge than Western Cape, North West (77.5%), and Gauteng. Finally, when it came to race, significantly fewer black Africans (60.9%) reported being well-informed about TB than Indians (75.8%) and whites (73%).

Table 3.11.1.11: Knowledge of the need for HIV testing of individuals with TB among all participants by sex, age, locality, province and race, South Africa 2012

Background characteristics	Yes		No		Don't know		Total
	%	95% CI	%	95% CI	%	95% CI	n
Sex							
Male	80.4	[78.0–82.6]	11.2	[9.5–13.3]	8.3	[7.1–9.8]	6 035
Female	81.5	[79.5–83.3]	10.2	[8.7–12.0]	8.2	[7.1–9.5]	8 521
Total	81.0	[79.0–82.8]	10.7	[9.2–12.4]	8.3	[7.2–9.5]	14 556
Age							
15–24	80.2	[77.6–82.5]	12.5	[10.6–14.7]	7.3	[6.0–8.9]	4 122
25–34	84.1	[81.3–86.5]	10.4	[8.5–12.7]	5.5	[4.1–7.3]	2 862
35–44	82.8	[79.9–85.4]	9.9	[8.1–12.1]	7.3	[5.7–9.2]	2 390
45–54	81.6	[78.5–84.3]	10.0	[7.8–12.7]	8.4	[6.8–10.4]	2 166
55–64	79.6	[75.8–82.9]	9.8	[7.4–12.8]	10.6	[8.5–13.2]	1 668
65+	69.8	[65.1–74.1]	9.5	[6.7–13.3]	20.7	[17.2–24.8]	1 344
Total	81.0	[79.0–82.8]	10.7	[9.2–12.4]	8.3	[7.2–9.5]	14 552
Locality							
Urban formal	83.7	[80.8–86.3]	10.8	[8.5–13.6]	5.5	[4.5–6.7]	7 890
Urban informal	81.8	[77.5–85.4]	11.4	[8.7–14.9]	6.8	[4.7–9.6]	1 803
Rural formal	84.8	[79.5–89.0]	6.1	[4.5–8.1]	9.1	[5.8–14.0]	1 774
Rural informal	73.1	[69.9–76.1]	11.8	[9.6–14.3]	15.1	[12.4–18.3]	3 095
Total	81.0	[79.0–82.8]	10.7	[9.2–12.4]	8.3	[7.2–9.5]	14 562
Province							
Western Cape	91.1	[87.7–93.6]	4.5	[3.0–6.8]	4.4	[3.0–6.3]	2 061
Eastern Cape	73.2	[68.7–77.3]	10.0	[8.0–12.4]	16.8	[12.6–21.9]	1 553
Northern Cape	89.3	[84.9–92.5]	4.4	[2.7–7.2]	6.3	[3.4–11.4]	966
Free State	75.4	[70.5–79.6]	8.0	[5.5–11.5]	16.6	[12.6–21.6]	802
KwaZulu–Natal	81.7	[78.6–84.5]	9.0	[7.1–11.3]	9.3	[7.2–11.8]	2 384
North West	73.7	[67.7–79.0]	22.8	[17.4–29.2]	3.5	[2.3–5.3]	1 824
Gauteng	84.9	[79.8–88.8]	11.6	[8.1–16.5]	3.5	[2.4–5.1]	2 501
Mpumalanga	87.6	[84.0–90.4]	6.5	[4.3–9.7]	5.9	[4.0–8.6]	1 257
Limpopo	68.5	[62.5–74.0]	12.0	[9.4–15.2]	19.5	[14.6–25.5]	1 214
Total	81.0	[79.0–82.8]	10.7	[9.2–12.4]	8.3	[7.2–9.5]	14 562
Race							
African	78.9	[76.6–81.1]	11.8	[10.1–13.8]	9.2	[7.9–10.7]	9 664
White	89.5	[84.9–92.9]	6.6	[3.9–10.8]	3.9	[2.4–6.3]	677
Coloured	87.8	[85.3–90.0]	6.6	[4.8–8.9]	5.6	[4.3–7.3]	2 939
Asian/Indian	82.7	[77.9–86.6]	8.6	[5.3–13.8]	8.7	[6.2–11.9]	1 232
Total	81.0	[79.0–82.8]	10.7	[9.2–12.4]	8.3	[7.2–9.5]	14 512

95% CI: 95% confidence interval

Table 3.11.2.1: Self-reported perceptions of being well-informed among all participants aged 15 years and older by sex, age, locality, province, and race, South Africa 2012

Background characteristics	Yes		No		Total
	%	95% CI	%	95% CI	n
Sex					
Male	62.0	[59.0–64.8]	38.0	[35.2–41.0]	6 228
Female	64.3	[61.7–66.8]	35.7	[33.2–38.3]	8 796
Total	63.2	[60.7–65.7]	36.8	[34.3–39.3]	15 024
Age					
15–24	60.3	[56.9–63.6]	39.7	[36.4–43.1]	4 243
25–34	64.5	[61.1–67.7]	35.5	[32.3–38.9]	2 971
35–44	66.4	[63.2–69.4]	33.6	[30.6–36.8]	2 468
45–54	65.3	[60.5–69.8]	34.7	[30.2–39.5]	2 241
55–64	64.6	[60.1–68.9]	35.4	[31.1–39.9]	1 708
65+	56.3	[51.1–61.5]	43.7	[38.5–48.9]	1 390
Total	63.2	[60.7–65.7]	36.8	[34.3–39.3]	15 021
Locality					
Urban formal	69.4	[66.1–72.5]	30.6	[27.5–33.9]	8 123
Urban informal	58.6	[53.0–64.0]	41.4	[36.0–47.0]	1 872
Rural formal	60.0	[53.2–66.4]	40.0	[33.6–46.8]	1 830
Rural informal	51.9	[46.6–57.2]	48.1	[42.8–53.4]	3 205
Total	63.2	[60.7–65.7]	36.8	[34.3–39.3]	15 030
Province					
Western Cape	67.0	[61.8–71.8]	33.0	[28.2–38.2]	2 118
Eastern Cape	46.8	[39.2–54.5]	53.2	[45.5–60.8]	1 591
Northern Cape	64.9	[54.2–74.3]	35.1	[25.7–45.8]	988
Free State	55.6	[49.7–61.4]	44.4	[38.6–50.3]	811
KwaZulu–Natal	60.8	[55.7–65.7]	39.2	[34.3–44.3]	2 479
North West	77.5	[71.6–82.5]	22.5	[17.5–28.4]	1 886
Gauteng	68.7	[63.4–73.5]	31.3	[26.5–36.6]	2 594
Mpumalanga	66.1	[53.8–76.6]	33.9	[23.4–46.2]	1 323
Limpopo	51.5	[42.8–60.1]	48.5	[39.9–57.2]	1 240
Total	63.2	[60.7–65.7]	36.8	[34.3–39.3]	15 030
Race					
African	60.9	[57.9–63.8]	39.1	[36.2–42.1]	9 993
White	73.0	[64.3–80.2]	27.0	[19.8–35.7]	689
Coloured	68.3	[63.8–72.6]	31.7	[27.4–36.2]	3 018
Asian/Indian	75.8	[67.9–82.3]	24.2	[17.7–32.1]	1 278
Total	63.2	[60.7–65.7]	36.8	[34.3–39.3]	14 978

95% CI: 95% confidence interval

3.11.3 Attitudes and stigma

People with TB are often stigmatised and also experience discrimination from their communities because of being infected with the disease (Genberg et al. 2008; Kalichman & Simbayi 2004; Zhang, Liu, Bromley et al. 2007). The negative attitude towards people with TB is reported to discourage people from seeking help and treatment. In this survey, participants' feelings towards people with TB were ascertained as a way of examining the levels of expressed stigma towards individuals infected with TB.

Personal feelings towards people infected with TB

When asked to give their feelings towards people with TB, the majority of respondents (75.4%) expressed empathy towards individuals with TB. Very few people reported fear of people with TB, and many also wished to help them. There were no significant differences found between sexes.

Table 3.11.3.1 shows disaggregated data on personal feelings towards people with TB, by locality type, province and race. Significantly more respondents from rural informal (tribal) areas (83%) expressed compassion towards individuals with TB and would like to help them compared to those from urban formal areas (71.9%). When comparing provinces, Gauteng (64.8%) was found to be the least empathic compared to all other provinces (range 71.6% to 87.0%) with the exception of Northern Cape (70.8%).

When the data were disaggregated, males in rural informal (81.6%) felt sorry for TB infected people and wanted to help as compared to rural formal areas (71.5%) and urban formal areas (69.2%) but the rural informal areas had the least number of respondents who reported wanting to stay away. A higher number of black Africans wanted to help (74.5%) people with TB compared to whites (62.4%). For the female respondents, the trends for feelings towards people infected with TB was similar to the total sample.

3.11.4 Self–reported TB diagnosis and adherence to anti-TB treatment

In this survey, bio-marker testing to confirm a diagnosis of TB was not conducted because this would have been beyond the scope of the survey parameters. Consequently, the survey relied on self-reported data to ascertain whether participants had ever been diagnosed with TB. While self-reported data is not ideal (Brouwer, Napravnik, Smiley et al 2011; Gauci, Gilles, O'Brien et al. 2006), it provides at least a crude measure of lifetime prevalence of TB infection.

Self-reported TB diagnosis

When asked if they had been ever diagnosed with TB in their lifetime, only 5.9% of the sample indicated that they had been. There were no significant differences found in the prevalence of self-reported TB diagnosis by sex.

Table 3.11.4.1 shows self-reported TB diagnosis disaggregated by age, locality type, province and race. The prevalence of self-reported TB diagnosis was significantly lower among youth aged 15–24 years (1.9%) as compared to older age groups (range 4.9% to 9.0%). In terms of locality type, urban formal areas (4.9%) reported significantly lower lifetime prevalence of TB than urban informal (8.2%) and rural informal (7.3%) areas. Finally, the prevalence of self-reported TB diagnosis was significantly higher among coloured respondents (8.6%), than among whites (1.6%).

As expected, once diagnosed there was almost universal access (95.9%) to treatment for TB reported by respondents among those who reported that they had ever been diagnosed with TB. When the data were disaggregated by sex, age groups, place of residence, provinces, and race, no significant differences were found.

Table 3.11.3.1: Personal feelings towards people with TB among all participants aged 15 years and older by sex, locality and province, South Africa 2012

Background characteristics	Which statement is closest to your feelings about people with TB disease?														Total
	I feel sorry for them but I would like to help them		I feel sorry for them but I tend to stay away from these people		It is their problem and I cannot get TB		I fear them because they may infect me		I have no particular feeling		Other		More than one option selected		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Sex															
Male	73.0	[69.9–75.9]	13.3	[11.3–15.5]	2.2	[1.7–2.9]	3.3	[2.4–4.5]	6.9	[5.5–8.7]	1.0	[0.7–1.6]	0.2	[0.1–0.4]	6 196
Female	77.6	[74.8–80.2]	11.1	[9.4–13.1]	2.3	[1.6–3.2]	3.0	[2.3–3.9]	5.0	[4.0–6.2]	0.9	[0.6–1.4]	0.1	[0.1–0.2]	8 748
Total	75.4	[72.7–78.0]	12.1	[10.4–14.1]	2.2	[1.7–3.0]	3.2	[2.5–4.0]	5.9	[4.8–7.2]	1.0	[0.7–1.4]	0.2	[0.1–0.3]	14 944
Locality															
Urban formal	71.9	[67.5–75.9]	13.9	[11.3–17.0]	2.8	[1.9–4.0]	3.7	[2.6–5.2]	6.9	[5.2–9.1]	0.8	[0.4–1.4]	0.1	[0.0–0.3]	8 083
Urban informal	78.1	[72.6–82.8]	10.1	[7.4–13.6]	1.7	[0.7–4.3]	3.8	[2.4–5.7]	5.0	[2.9–8.5]	0.7	[0.3–1.5]	0.6	[0.3–1.1]	1 858
Rural formal	74.0	[66.9–80.0]	14.2	[10.5–18.8]	2.8	[1.8–4.2]	1.6	[0.8–3.1]	6.6	[3.9–11.1]	0.5	[0.2–1.4]	0.4	[0.2–0.8]	1 823
Rural informal	83.0	[79.9–85.7]	8.3	[6.4–10.7]	1.1	[0.7–1.6]	2.2	[1.8–2.9]	3.7	[2.7–5.2]	1.6	[1.0–2.6]	0.1	[0.0–0.3]	3 186
Total	75.4	[72.7–78.0]	12.1	[10.4–14.1]	2.2	[1.7–3.0]	3.2	[2.5–4.0]	5.9	[4.8–7.2]	1.0	[0.7–1.4]	0.2	[0.1–0.3]	14 950
Province															
Western Cape	79.0	[73.1–83.9]	11.8	[8.7–15.9]	1.2	[0.8–1.9]	1.7	[1.1–2.6]	5.7	[3.8–8.4]	0.3	[0.1–0.8]	0.3	[0.1–0.6]	2 106
Eastern Cape	84.0	[79.4–87.8]	7.2	[5.2–9.7]	0.4	[0.2–0.9]	1.9	[1.3–2.8]	5.1	[3.2–8.0]	1.3	[0.6–2.6]	0.1	[0.0–0.5]	1 588
Northern Cape	70.8	[60.8–79.1]	14.4	[8.5–23.4]	2.4	[1.2–4.8]	1.5	[0.7–3.2]	9.5	[4.8–17.7]	1.4	[0.6–3.2]	*	[0.0–0.2]	979
Free State	87.0	[82.8–90.3]	4.6	[2.6–8.2]	1.3	[0.7–2.6]	4.3	[2.4–7.6]	1.5	[0.6–3.6]	1.2	[0.6–2.6]	*	[0.0–0.1]	811
KwaZulu–Natal	83.7	[79.3–87.3]	7.6	[5.5–10.3]	0.7	[0.4–1.1]	4.0	[2.3–6.7]	3.2	[1.9–5.3]	0.6	[0.4–1.1]	0.2	[0.1–0.6]	2 471
North West	71.6	[66.0–76.6]	15.1	[11.8–19.1]	3.6	[2.0–6.1]	2.8	[2.0–3.9]	4.9	[2.8–8.4]	1.9	[0.7–4.8]	0.2	[0.1–0.5]	1 871
Gauteng	64.8	[57.9–71.1]	16.9	[12.8–22.0]	4.3	[2.9–6.4]	4.3	[2.6–6.8]	8.7	[6.0–12.7]	0.9	[0.4–2.0]	0.2	[0.1–0.5]	2 579
Mpumalanga	81.4	[74.8–86.6]	9.3	[7.0–12.2]	1.7	[0.7–3.9]	1.5	[0.9–2.5]	5.3	[2.5–10.8]	0.5	[0.1–1.6]	0.3	[0.1–1.0]	1 310
Limpopo	79.3	[73.8–83.8]	11.6	[8.4–15.9]	0.7	[0.3–1.6]	2.3	[1.6–3.2]	4.5	[2.9–7.1]	1.4	[0.6–3.1]	0.2	[0.0–0.6]	1 235
Total	75.4	[72.7–78.0]	12.1	[10.4–14.1]	2.2	[1.7–3.0]	3.2	[2.5–4.0]	5.9	[4.8–7.2]	1.0	[0.7–1.4]	0.2	[0.1–0.3]	14 950

95% CI: 95% confidence interval

** Too few obervations to record reliably*

Table 3.11.4.1: Percentage of participants who have ever been diagnosed with TB, by sex, age, locality, province and race, South Africa 2012

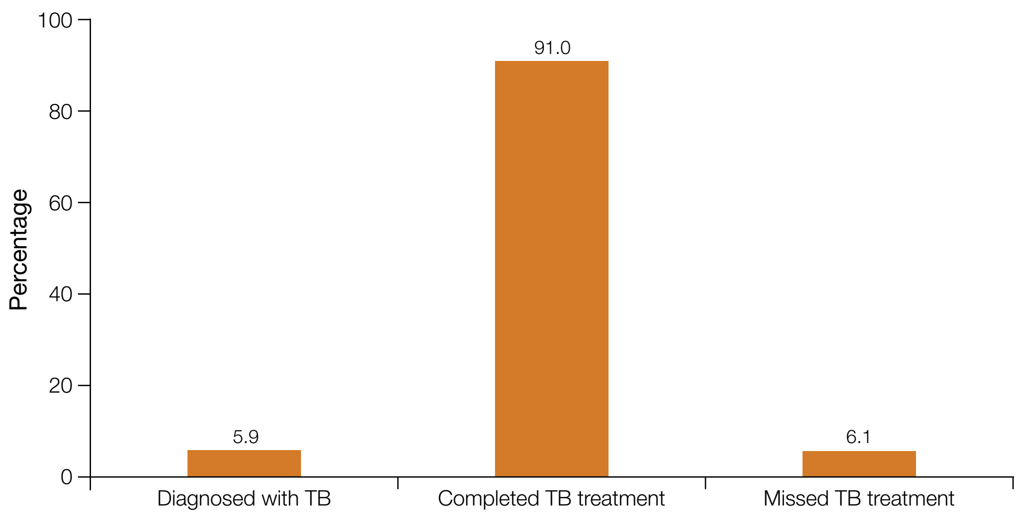
Background characteristics	Yes		No		Total
	%	95% CI	%	95% CI	n
Sex					
Male	6.6	[5.6–7.7]	93.4	[92.3–94.4]	6 229
Female	5.3	[4.7–6.1]	94.7	[93.9–95.3]	8 806
Total	5.9	[5.3–6.7]	94.1	[93.3–94.7]	15 035
Age					
15–24	1.9	[1.5–2.5]	98.1	[97.5–98.5]	4 246
25–34	6.3	[5.1–7.8]	93.7	[92.2–94.9]	2 965
35–44	8.8	[7.3–10.5]	91.2	[89.5–92.7]	2 467
45–54	9.0	[7.2–11.1]	91.0	[88.9–92.8]	2 245
55–64	7.4	[5.9–9.2]	92.6	[90.8–94.1]	1 715
65+	4.9	[3.6–6.6]	95.1	[93.4–96.4]	1 391
Total	5.9	[5.3–6.7]	94.1	[93.3–94.7]	15 029
Locality					
Urban formal	4.9	[4.0–6.0]	95.1	[94.0–96.0]	8 122
Urban informal	8.2	[6.1–10.9]	91.8	[89.1–93.9]	1 872
Rural formal	6.4	[4.7–8.5]	93.6	[91.5–95.3]	1 834
Rural informal	7.3	[6.2–8.6]	92.7	[91.4–93.8]	3 213
Total	5.9	[5.3–6.7]	94.1	[93.3–94.7]	15 041
Province					
Western Cape	9.6	[7.1–12.9]	90.4	[87.1–92.9]	2 105
Eastern Cape	8.9	[7.3–10.9]	91.1	[89.1–92.7]	1 602
Northern Cape	8.1	[6.1–10.6]	91.9	[89.4–93.9]	1 001
Free State	9.5	[7.5–11.9]	90.5	[88.1–92.5]	806
KwaZulu–Natal	9.3	[7.5–11.4]	90.7	[88.6–92.5]	2 486
North West	5.6	[4.1–7.6]	94.4	[92.4–95.9]	1 893
Gauteng	2.5	[1.7–3.7]	97.5	[96.3–98.3]	2 580
Mpumalanga	4.8	[3.6–6.5]	95.2	[93.5–96.4]	1 326
Limpopo	3.2	[2.3–4.3]	96.8	[95.7–97.7]	1 242
Total	5.9	[5.3–6.7]	94.1	[93.3–94.7]	15 041
Race					
African	6.3	[5.5–7.2]	93.7	[92.8–94.5]	10 014
White	1.6	[0.8–3.0]	98.4	[97.0–99.2]	680
Coloured	8.6	[7.1–10.4]	91.4	[89.6–92.9]	3 016
Asian/Indian	3.3	[1.4–7.5]	96.7	[92.5–98.6]	1 280
Total	5.9	[5.3–6.7]	94.1	[93.3–94.7]	14 990

95% CI: 95% confidence interval

Adherence to anti-TB treatment

The percentage of participants who reported having a diagnosis of TB in their lifetime was low (5.9%). Consequently a small number of individuals reported being on treatment for TB infection, and missing their TB treatment at times. When asked about completing the TB treatment, 6.1% reported that they missed TB treatment at times. There were no significant differences found for adherence to TB treatment according to the various reporting domains.

Figure 3.11.4.1: TB diagnosis and treatment adherence among participants aged 15 years and older, South Africa 2012



Discussion and conclusions

In this section, the focus is on knowledge and awareness, attitudes and stigma and self-reported TB diagnosis.

Knowledge and awareness

As TB is a major public health problem worldwide, it is essential and imperative to assess participant's knowledge and awareness about the disease. Studies on prevalence and knowledge of TB that have been conducted in other countries demonstrate that misconceptions about TB still exist (Edginton, Sekatane & Goldstein 2002; Gelaw, Genebo, Dejene et al. 2001; Sreeramareddy, Harsha Kumar & Arokiasamy et al. 2013). A cross-sectional study that was conducted in Libya in 2009, for example, showed that knowledge about TB was poor and that greater awareness was needed (Solliman, Hassali, Al-Haddad et al. 2012). However, in South Africa people were found to be more well-informed about TB relative to other countries (Edginton, Sekatane & Goldstein 2002; Gelaw, Genebo, Dejene et al. 2001; Sreeramareddy, Harsha Kumar & Arokiasamy et al. 2013).

It is not surprising that the participants from Western Cape and KwaZulu-Natal had stronger opinions about the seriousness of TB disease than the other provinces. It is well established in South Africa that the Western Cape and KwaZulu-Natal have the highest rates of TB in the country (Abdool Karim, Churchyard, Karim et al. 2009; Padayatchi, Naidoo, Dawood et al. 2010) and are consequently more exposed to and aware of the seriousness of TB. The difference between these two provinces, however, is that KwaZulu-Natal has a proportionately high rate of HIV-infection as well, whereas Western Cape Province has a disproportionately low rate of HIV-infection as compared to TB infection rates (Padayatchi et al. 2010; NdoH 2010, NdoH 2012).

In addition, the fact that participants in urban formal areas had stronger opinions about the seriousness of TB disease than those in rural informal areas (tribal), once again implies that those in urban areas have more exposure to the disease than those in rural areas. It is also plausible that those in urban formal areas live in more crowded conditions, making the transmission of TB 'easier', and leading to the higher prevalence of TB disease (Hargreaves, Boccia, Evans et al. 2011; Harling, Ehrlich & Myer 2008). This is, however, contrary to the study conducted in a rural community near Kampala, Uganda, where most study participants showed knowledge of TB as an airborne disease and were aware of preventive and treatment options available (Buregyeya, Kulane, Colebunder 2011).

Participant's knowledge of TB was also tested by asking about the signs and symptoms of TB as an infectious disease. It is interesting to note that while a large proportion of the participants in the survey understood the seriousness of TB, a relatively smaller number could identify more than three signs or symptoms of the disease. This implies that knowing the seriousness of the disease does not translate into knowing signs and symptoms of the disease. This is an important finding given that the majority of participants in the survey perhaps will not seek diagnostic assessment in order to obtain the necessary treatment timeously even if experiencing TB symptoms. Health education about infectious diseases, especially TB, requires a more vigorous approach to knowledge dissemination (Sudore, Harris, Mehta et al. 2006). The difference in knowledge between whites, Indians and black Africans (with whites and Indians knowing more signs and symptoms of TB compared to black Africans) perhaps highlights the fact that a conscious effort needs to be made to provide more information to black Africans about TB, particularly given that they are disproportionately affected by HIV and AIDS and TB co-infection ((Abdool Karim, Churchyard, Karim et al. 2009). Younger individuals also need to be targeted for health education messages about TB given that, as expected, they knew fewer signs and symptoms of the disease than older individuals.

Western Cape had significantly higher levels of knowledge that TB can be cured as compared to other provinces. This finding is important, particularly in the face of the Department of Health's efforts to increase TB cure rates, as it may pose a challenge to health practitioners. More exploration and analysis is required to ascertain whether the cure rates for TB are higher in the provinces that know that TB is curable as opposed to those provinces where this knowledge is at a lower level. Similarly, the observation that those participants aged 65 years and older had significantly lower levels of knowledge that TB is curable makes these individuals an important target group for TB health literacy campaigns (Sudore et al. 2006).

The findings regarding the perception of the co-morbidity between TB and HIV-infection provide insight into participants' ability to separate TB and HIV as two separate diseases, as well as to understand TB/HIV co-morbidity. In Western Cape where there are high TB prevalence and low HIV rates, participants were able to recognise that not all TB-infected individuals are living with HIV. In provinces where there is a high correlation between TB and HIV-infection, such as KwaZulu-Natal, participants were less likely to view TB and HIV as separate diseases.

Other factors to consider when conducting literacy campaigns to increase knowledge about TB/HIV co-morbidity are the fact that a greater number of older respondents and those in rural areas did not know whether people infected with TB are HIV-positive. Given the high rate of TB/HIV co-infection in South Africa (Abdool Karim et al. 2009), it is important for individuals to know that if they are infected with TB they should test for HIV and if they test positive for HIV, they should test for TG. Overall, South Africans were highly aware of the need for HIV testing among individuals with TB. However, the level of awareness was significantly lower among older participants, and those from rural informal (tribal areas) compared to participants in both in urban formal and rural formal areas. Urban–rural disparities in health literacy are common. Participants in Limpopo can be regarded as a vulnerable group relative to other provinces given that they are less likely to understand the importance of testing for HIV if a person is infected with TB. These findings suggest the need to provide more health education about HIV-TB co-infections to selected target groups and simultaneously address both diseases if treatment is indicated.

It is interesting to note that while a large majority of participants recognised the seriousness of TB as a disease, relatively fewer (two-thirds) stated that they were well-informed about the disease. It is clear that more comprehensive information about TB needs to be provided to the population at large. Older people and relatively poorly resourced provinces should also be targeted in the drive to increase the quality and quantity of information provided about TB as an infectious disease. It is important that innovative education and specific health messages about TB, HIV and TB/HIV co-infection is required on a wider scale throughout the country in order for individuals to access appropriate health care for themselves as well as their family members.

Attitudes and stigma

The finding that participants in rural areas expressed the most compassionate feelings towards individuals infected with TB is indicative of the observation that there are perhaps higher levels of social cohesion and community-orientation in the rural informal or tribal areas as compared to more urbanised areas (Campbell 2004; Courtwright & Turner 2010). Participants in the provinces that were the least empathic towards individuals with TB, such as Gauteng, is reflective of a more 'individualistic' orientation with an expectation that TB-infected individuals should take responsibility to access health care and treatment because it is perceived to be readily available (Marks, Murray, Evans et al. 2005). Those in Gauteng 'felt sorry' for those infected with TB but would also choose to stay away from them.

Self-reported TB diagnosis

There was a low level of lifetime prevalence of TB diagnosis (5.9%) among participants in this survey who were 15 years or older. This prevalence estimate is lower than prevalence figures reported in the literature that were based on bio-marker testing, the TB register and clinic records (Blumberg et al. 2005; Wallis et al. 2009). Health inequalities and infectious diseases such as TB are strongly associated, implying that individuals with poor living standards are more prone to becoming infected. This was confirmed in this survey with participants residing in urban and rural informal areas reporting higher levels of lifetime TB diagnosis than those residing in urban and rural formal areas. Despite the relatively low prevalence, it is interesting to note that the coloured population group reported the highest lifetime prevalence of TB diagnosis. This finding is consistent with prevalence of TB based on bio-marker testing (Padayatchi et al. 2010; NdoH 2010; NdoH 2012).

Strict adherence to TB treatment is important for improving TB cure rates. The majority of participants in this survey who reported being diagnosed with TB in their lifetime adhered to their TB treatment regimens, with a very small percentage reporting that they missed their TB treatment. Further analysis of the data is necessary in order to examine the correlations between provinces with a high TB disease burden, adherence to TB treatment and TB cure rates.

Conclusion

Examining knowledge and awareness, attitudes, stigma, lifetime prevalence of TB diagnosis, and knowledge about the relationship between TB and HIV-infection was done using self-report data. The significant findings do not differ strongly from what is reported in the existing literature about the epidemiological pattern of the disease and the social issues that TB-infected individuals have to deal with. Perhaps the primary lesson from these findings is that there are certain age groups, specific provinces and indeed specific regions (urban compared to rural, formal compared to informal) that need to be targeted for knowledge dissemination about TB as an infectious disease (Verhagen, Kapinga & Van Rosmalen 2010) in order to improve cure rates as well as to improve the health outcomes of HIV-positive individuals co-infected with TB.

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Conclusions and recommendations

The primary objectives of the SANHANES-1 were to assess defined aspects of the health and nutritional status of South Africans with respect to the prevalence of non-communicable diseases (NCDs) (specifically cardiovascular disease, diabetes and hypertension) and their risk factors (diet, physical activity and tobacco use). In particular, the study aimed to investigate the knowledge, attitudes and behaviour of South Africans with respect to non-communicable and communicable infectious diseases; the nutritional status of South Africans as it relates to food security, dietary intake/behaviour including the consumption of alcohol, and body weight management; the relationship between general perceptions of health and health care services; the health status of children; the behavioural (smoking, diet, physical inactivity) and social determinants of health and nutrition (demographic, socio-economic status and geolocation) and relate these to the health and nutritional status of the South African population. Apart from using questionnaire-based interviews, the survey also collected several health measurements, which entailed undertaking among others a clinical examination, a selection of clinical tests and the collection of a blood sample.

CONCLUSIONS

The key findings in the study are outlined below.

1. Non-communicable diseases (NCDs)

In terms of NCDs (hypertension, heart disease, stroke and diabetes), significantly large minorities of respondents self-reported a family history of both high blood pressure and high blood sugar while smaller minorities reported a family history of stroke and heart disease (heart attack, angina, chest pain). Self-reported personal history rates were higher in females than in males for high blood pressure, heart disease and high blood sugar. Among both males and females, the reported rate of all NCDs tended to increase with age as expected, being the highest in the group of 65 years and older participants.

In the clinical tests/investigations included in SANHANES-1, overall significantly large minorities of participants aged 15 years and older had prehypertensive systolic and prehypertensive diastolic blood pressures. Hypertension was present in smaller minorities of the participants in the survey with no sex differences. Of those respondents who volunteered to undergo clinical examination and were found to have high blood pressure, more than two-thirds were overweight or obese, and one quarter drank alcohol. One out of five males aged 15 years and older had an abnormally high serum total- and LDL-cholesterol concentrations, and one out of two an abnormal HDL-cholesterol concentration. In female participants, the prevalence of abnormal lipid concentrations was even higher, with almost one out of three females aged 15 years and older having an abnormally high serum total- and LDL-cholesterol. Participants residing in the formal urban areas had the highest prevalence of such abnormal concentrations. In terms of blood sugar control, almost one out of five participants had impaired glucose homeostasis. Diabetes was diagnosed in one out of ten, and should be excluded in an equal proportion of the participants who had impaired glucose homeostasis. The prevalence of impaired glucose homeostasis and diabetes increased with age, reaching a peak in the 45–64 years age group. In terms of aerobic fitness, almost one-third of male participants and half of female participants were found to be physically unfit. In line with global trends, physical fitness was found to decrease with age.

2. Adult health risk profiles

The next section highlights the key findings in relation to tobacco and the use of tobacco products.

a) Smoking

This survey is also the first nationally representative biobehavioural study of tobacco products use in South Africa. Overall, there has been a 50% decline in adult smoking prevalence over the 20 years from 1992 to 2012 as seen in evidence from both All Media and Products Survey (AMPS) data (Reddy, James, Sewpaul et al. 2013) and this survey. This has occurred during the time when the South African Government was implementing a comprehensive programme of tobacco control. During the same period there were successive declines in smoking amongst school going adolescents as seen in the South African Global Youth Tobacco Survey (GYTS) studies, from 23.0% in 1999 to 16.9% in 2011 – a 25% reduction over a 12-years period (Reddy, James, Sewpaul et al. 2013).

When blood cotinine levels were examined, current smoking prevalence was low while exposure to environmental tobacco smoke (ETS) revealed by blood cotinine levels greater than 10 ng/ml was nearly twice as much. Yet only about the same proportion of individuals as the current smoking prevalence reported being exposed to ETS on a daily basis in the home, suggesting that they had inhaled ETS without being aware of it. This occurred despite prohibitions on smoking in public places, and indicates that children, women and men are being exposed to ETS at home. According to WHO, 10% of the six million tobacco-attributable deaths in the world every year are caused by ETS. The findings of this survey suggest that the morbidity and mortality from ETS in South Africa may be considerable (WHO World Tobacco Report 2011). This justifies the South African Government legislation banning smoking in a car when a child younger than 12 years old is in the vehicle.

Overall, the survey showed that there is considerable heterogeneity in tobacco using prevalence and behaviour in South Africa according to race, province, age and gender. Coloured women demonstrated the highest smoking prevalence which was up to five times higher than that found among all the other women. This has resulted in a 300% increase in lung cancer rates amongst coloured women over the past 20 years (Reddy, James, Sewpaul et al. 2013).

The survey also found that health warning labels have encouraged nearly half of all the smokers to consider quitting, suggesting that this strategy, and possibly plain packaging is an effective method for smoking cessation.

The survey found that the average age of initiation of smoking increases with age. Individuals who were older than 35 years reported significantly higher mean ages of initiation of smoking than those aged 15–34 years. This suggests that the strategies to prevent the industry from recruiting smokers in adolescence are bearing fruit.

b) Nutritional status of adults and children

The survey's key findings on the nutritional status of participants of all ages are summarised in this section of the conclusions.

i. Food security

Hunger has a detrimental impact on the population both socially and physically. Hunger is also referred to as food insecurity, while its absence is considered as evidence of food security; either by the individual or the household. Food security is defined as a condition that 'exists when all people, at all times, have physical, social and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life' (FAO 2010).

In order to measure hunger, this survey used the same instrument that was used in other national surveys in the past so as to afford perspective on trends in its prevalence in the country. Overall, just under half of the population was food secure, while a quarter were at risk of hunger and the same proportion also experienced hunger. The largest proportion of participants who experienced hunger (food insecurity) were found both in urban informal and in rural formal localities. In relation to the findings of the three national surveys conducted in the 1999–2008 period (Labadarios, Van Middelkoop 1995; Labadarios, Steyn, Maunder et al. 2000; Labadarios 2007; Labadarios, Steyn, Nel et al. 2011) the findings of this survey suggest that the marked improvement in household food security status observed in the 1999–2008 period has been maintained, but not improved.

ii. Dietary intake/behaviour

A variety of foods in the diet, as measured by the Dietary Diversity Score (DDS) i is necessary to ensure an adequate intake of essential nutrients. The mean DDS across all age categories at the national level was found to be just slightly above the cut-off level for dietary adequacy (< 4), a score that improved marginally from that recorded in 2009 (Labadarios, Steyn, Nel et al. 2011). Apart from reflecting on food security, a low DDS has also been associated with low weight and stunted growth in children, cardiovascular risk, dyslipidaemia as well as a risk factor for the metabolic syndrome. The findings of this survey also indicate that one out five of the survey's participants aged 15 years and older had a high fat and high sugar intake score and a quarter had a low fruit and vegetables score. Overall, the survey's participants had a medium nutrition knowledge score, three-quarters of them believed that 'how much one eats and drinks can make a difference in one's risk of becoming fat'. In terms of dietary behaviour, almost half of adult participants reported that they ever ate outside the home, while almost one third reported that they ate outside their home on a monthly or weekly basis. Females were mainly responsible for doing grocery shopping and considered a number of factors when purchasing foods that males considered less frequently. Interestingly though even among females, although one third considered the price of a given food item as important, only one in seven took health considerations into account when purchasing foods.

The prevalence of anaemia in all participants older than 15 years of age was relatively low with female participants having almost double the prevalence found in males. Similarly, the prevalence of mild, moderate, and severe anaemia was significantly higher in females. Almost one out of four females of reproductive age had anaemia. In this vulnerable group of females, iron depletion/deficiency (on the basis of serum ferritin levels) decreased by 17.2% from the prevalence recorded in 2006 (Labadarios 2007). Iron deficiency anaemia was detected in one out of ten females in this age group, a level similar to that recorded in 2006 (Labadarios 2007). Over the same period, the prevalence of vitamin A deficiency decreased by more than 50%, a decrease that was accompanied by increased concentrations of vitamin A in the blood. The improvement in both iron and vitamin A status may well be a beneficial outcome of the national food fortification policy enacted in 2003.

The large majority of the children indicated that they ate breakfast before school while a minority indicated that they did not. The most common reason indicated by a substantial number of participants was ‘not being hungry early in the morning’, followed by ‘not having enough food in the house’ and ‘people at home do not have breakfast’, while a small proportion answered ‘cannot get up early enough’, and lastly ‘could not make their own breakfast’. More than half of children aged 10–14 years indicated that they did not take a lunch box to school and only over one third of children indicated that they did.

There were no differences between males and females in taking a lunch box to school. However, children in the rural informal setting were significantly less likely to take lunch boxes to school than children in urban formal and urban informal settings. In terms of frequency and amount of money taken to school, over half of the children indicated that they took money to school, one third indicated that they did not, while half of them indicated that they only sometimes took money to school. Of those who took money to school, close to half did it every day and a slight majority took money to school two or three times a week. With respect to the amount of money that children took to school, overall, the mean amount of money children took to school on any given day was R5.75.

The mean general nutrition knowledge score achieved by children was 1.8 out of a total of 6 points, irrespective of the sex of the child. The majority had low knowledge scores. However, the children achieved a medium mean score of 5.1 out of a total of 7 points for the correct identification of healthier alternatives, and a score of 5.4 out of 10 point for the correct identification of healthy fats. The majority had medium scores, with the remainder equally distributed between low scores and high scores.

In terms of micronutrient status in the children under five years of age, the prevalence of vitamin A deficiency was 43.6%, a 20% reduction compared to the proportion found in 2005 survey (Labadarios, Steyn, Maunder et al. 2005). Children are particularly vulnerable to iron deficiency anaemia because of their increased iron requirements in the periods of rapid growth, especially in the first five years of life. Overall, the prevalence of anaemia was 10.7%, mild anaemia 8.6% and moderate anaemia 2.1%. There were no cases of severe anaemia. The prevalence of iron depletion/deficiency was 8.1%, of iron deficiency anaemia 1.9% and of anaemia due to other causes 10.7%. The prevalence of iron depletion was significantly the highest in the 36–47 months age group and that of iron deficiency anaemia in the 24–35 months age group. Children living in rural informal areas had a significantly higher prevalence of iron depletion, while those living in urban informal areas had the highest prevalence of iron deficiency anaemia. The findings of the present survey indicate that anaemia and iron status have improved substantially among children under five years of age in South Africa since the last national survey in 2005 (Labadarios, Steyn, Maunder et al. 2005). Compared to 2005, the prevalence of anaemia decreased by 63.0%, that of iron deficiency anaemia by 83.0%, and iron depletion/deficiency by 44.2%. The improvement of the children’s micronutrient status with regards to iron and vitamin A may be related to the national food fortification programme.

iii. Household alcohol use

In terms of household alcohol use, the study found some relatively good news in that more than half of South African households did not have someone who drank alcohol and also that there was a widespread perception that very few young boys and girls drank alcohol. As expected, more adult men drank alcohol than women. It was however also most comforting to note that alcohol misuse was generally not perceived as a serious problem in most homes except in Mpumalanga as well as mostly among African and Indian households. The finding that alcohol misuse was generally perceived as a serious problem among black Africans is not surprising, as many previous studies have shown that they engage in high levels of binge drinking and hazardous or harmful drinking. However, the reasons why alcohol misuse was a problem in households in Mpumalanga and also among Indians is unclear and therefore warrants further investigation. It was however welcome news to learn that very few incidences of violence or disturbances were reported by study participants to have been due to alcohol misuse in households. Finally, as expected, a lot of eating food or snacking occurs while drinking alcohol especially among whites. This must be encouraged among other race groups especially black Africans, especially those living in rural formal (farms) areas and in Limpopo who do not consume food or snacks as this may also be because many of the high-risk alcohol drinkers frequently replace meals with alcohol.

iv. Body weight management

The body mass index (BMI) is a measure of nutritional status that combines weight with height data. It provides an acceptable approximation for assessment of total body fat and is a fairly reliable indicator of body fat for most adults, with athletes and the elderly being two exceptions. The BMI has been considered to be the most appropriate and simple indicator by which weight-for-height can be related to health outcomes. It is widely acknowledged that the risk of illness increases with modest increases in weight, starting from a BMI of about 21 kg/m^2. The survey data indicate that, overall, South African females are significantly heavier than males. However, as expected, males were significantly taller than females. South African males also had a lower BMI than females. The prevalence of overweight and obesity was significantly higher in females than males. On the other hand, the prevalence of underweight and normal weight was significantly higher in males than females There was a trend demonstrating that the BMI increased with age in both genders, while it later decreased in females in the age group 65 years and older participants. The younger age groups had significantly lower BMIs when compared with the older age groups. One out of ten males, as opposed to one out of two females had a waist circumference that exceeded the waist circumference and waist-to-hip ratio recommended cut-off levels indicative of a substantially increased risk for metabolic complications. When compared to previous national data (Department of Health 2007), the survey's findings indicate that the prevalence of underweight and normal weight decreased, while that of overweight and obesity increased. Body image perception and weight management data indicate that a third of participants (more males than females) were happy with their current body weight. Among the younger participants one of ten had attempted to lose (female) or gain (males) weight. Almost all participants were able to correctly identify a 'thin' or a 'fat' body image based on body image silhouettes, but only small minorities of both males and females were able to correctly identify a 'normal' body weight image.

South African girls were significantly heavier than boys and were also marginally taller than boys, but not significantly so. In relation to the mean BMI, South African boys had a mean BMI of 17.0 kg/m^2, which was not significantly different than that of girls. The percentage of normal and underweight children was significantly greater among boys than girls. The mean BMI increased with age in boys and girls. Girls had higher proportions than boys for overweight and for obesity at all ages. In terms of under-nutrition, boys were more stunted, wasted/thinner, and underweight than girls. Among all age groups, the prevalence of under-nutrition (wasting and underweight) among children younger than 10 years of age has decreased in South Africa since 2005. The exception is the prevalence of stunting among the 1–3-years old age group, which showed an increase of 11.7% from 2005.

3. Health status

The survey found that the trends for self-reported health status, daily functioning, disability and visual and hearing impairment were mostly as expected in that older participants had worse overall functioning than younger ones. However, this is an important finding because it brings to attention that the population is aging and needs to have specialised health care services and indeed greater access to health care.

In terms of mental health, older participants, black Africans, those in rural informal settings, participants from all provinces and females were particularly vulnerable to psychological distress. Despite the high levels of reported crime perpetrated by strangers in South Africa, family-related traumatic events were frequently reported. Finally, while the prevalence for post-traumatic-stress disorder (PTSD) was relatively low, the prevalence of PTSD symptoms was reportedly extremely high.

4. Use and perception of health care services

As regards the use and perception of health care services, it appears from the survey that young people, people living in rural informal areas, and black Africans were less likely to have ever needed to seek health care in the private sector, while whites were far less likely to have ever needed to seek health care in the public health sector. The public and private health care systems are still not integrated, with each providing care to a different profile of patients, determined largely by socio-economic and race distribution of the population. Disparities in the use of the private health sector still continue to date; many more black Africans seek care in public facilities than whites. This is expected because the historical past still leaves the white population economically endowed to have financial risk protection by enrolling in medical schemes which pay for private health care; explaining the reason for more black Africans receiving free health care in the public sector, for which the state pays. This is what the national health insurance aims to correct and ensure financial risk protection for all.

Overall, the overwhelming majority of South Africans are able to access needed health care largely in the public sector, but also a small proportion in the private sector. The observation that people reported very high levels of having received health care the last time it was needed (over 95% for all participant groups) indicates that access to health care is quite high in South Africa. The study results showed overall high satisfaction levels with the quality of health care, even though the private sector users were significantly more likely to be very satisfied than the public sector users. A negligent proportion of participants perceived the health care system to be of unacceptable quality, thus dispelling the often repeated myth that the quality of the health care system is so bad that national health insurance cannot be implemented. While there are pockets of unacceptable health care services provided in facilities, however they should not be used to generalise the state of the entire health care system. Although some may argue that those who are satisfied with the public health care system have low expectations, this still remains to be investigated; at present, there is no data to support such an assertion.

Most of the reasons for seeking care were for acute conditions rather than for chronic care. This is not a surprise because HIV/AIDS and TB are prevalent even though the participants did not report them as reasons for use of the health care system. In the next study it might be useful to recode all the other reasons for seeking care, which exceeded the proportion seeking care for acute or chronic conditions. This will assist in clarifying the major reasons for seeking health care.

From this study, it is concluded that health workers are seen by the public to be doing a good job in serving them, explaining the conditions clearly to patients, making decisions with their involvement, giving them privacy and treating them with respect. The participants of the study thought that the facilities in which they were served were clean, medicines were found to be available and so were the diagnostic tests needed to assess the health condition of patients. This is an acknowledgement of the good work being done by health workers.

5. Social and psychological determinants of tuberculosis (TB)

When it came to TB, which was examined using self-report data in this study, the survey found that knowledge and awareness, attitudes and stigma, lifetime prevalence of TB diagnosis, and knowledge about the relationship between TB and HIV-infection were relatively high, with differences among some provinces and geographical locality. In general, the findings were in much agreement with what has been reported in the existing literature about the epidemiological pattern of the disease and the social issues that TB infected individuals have to deal with (Buregyeya, Kulane, Colebunder et al. 2011). Perhaps the primary lesson from these findings is that there are certain age groups, specific provinces and indeed specific regions (urban compared to rural, formal compared to informal) that need to be targeted for knowledge dissemination about TB as an infectious disease (Verhagen, Kapinga & Van Rosmalen 2010) in order to improve cure rates as well as to improve the health outcomes of HIV positive individuals co-infected with TB.

RECOMMENDATIONS

On the basis of the evidence generated from the study, the following recommendations are made by the SANHANES-1 study team that require attention by all relevant stakeholders under the stewardship and leadership of the National Department of Health and/or Government:

1. Healthy public policies

In order to address the rising cost of living and reduce poverty and its effects on population health, it is critical now, more than ever to improve educational attainment and increase employment opportunities for the population. **The study team strongly recommends the implementation and institutionalisation of *Health in All Polices***, as recently emphasised at the 8th WHO Global Conference of Health Promotion in Helsinki, Finland, 2013. **This means implementation of healthy public policies within the National Development Plan – 2030 vision.** This means that other sectors' policies and programmes must be consistent with the protection and promotion of public health. For example, the Department of Agriculture, Fisheries and Forestry's food security policies and programmes must be sensitive to the need to not only reduce hunger and the risk of hunger but also ensure the production of nutrient-rich foods thereby providing wider dietary choices for populations.

2. Health status

The Department of Health should lead the country in implementing the Strategic Plan for the Prevention and Control of Non-Communicable Diseases, 2012–2016, which outlines key interventions to be implemented to achieve specified targets.

2.1 Risk factors for NCDs

The following recommendations are made in relation to NCDs risk factors.

a) SANHANES-1 shows that there is considerable heterogeneity in tobacco use in South Africa by race, province, age and gender. Coloured women continue to show the highest smoking prevalence compared to all women. Existing regulations on tobacco use have had some successes in reducing smoking in South Africa, but the profile of South Africans who smoke remains a large risk factor to non-communicable diseases, and the **SANHANES-1 team recommends that the new regulations on (a), Reduced Ignition Propensity (RIP) Cigarettes** (Regulation No. 429), (b) **Smoking** in Public Places and Certain Outdoor Public Places Regulation No 264 and Display of Tobacco Products at the Point of Sale (Regulation No. R634) should be implemented and their impact be monitored in future SANHANES-1 survey rounds.

b) The Team further recommends that **public smoking regulations be reviewed and enforced to ensure that the sale of cigarettes happens only in designated places with capacity to control under age purchases. In order to effectively reach rural communities, the anti-smoking campaign needs to be intensified**.

c) Nearly a third of adult men and two-thirds of adult women in South Africa are unfit. **To encourage physical activities, the team recommends the following**:
- **Introduction of worker-friendly policies that allow for physical and recreational activities in the workplace;**
- **Compulsory physical education training at schools;**
- **Recreational parks and sports facilities as part of new housing developments (examples in Brazil China and Finland);**
- **Ensuring provision of cycling tracks in the construction of new urban roads.**

d) The anthropometric measures for the South African population show that it is at high risk of being 'fat' and more so for women. The team **recommends a number of interventions that have been proven to work elsewhere** (Hill, Peters, Catenacci et al. 2008, WHO 2004):
- **Regulate all forms of advertisements of unhealthy foods;**
- **Community interventions through primary health care teams advising on healthy eating and exercises;**
- **Discourage sale of junk foods at schools and nearby shops;**
- **Ensure that nutritionists/dietitians are engaged at primary care level.**

e) Alcohol use: The study has found that **alcohol consumption is considered a serious problem in black African and Indian communities**. Several types of interventions can reduce high-risk alcohol use (Disease Control Priorities Project 2007). Two of these interventions that have been shown to be most effective internationally, namely, **higher alcohol sales taxes** and **brief interventions provided by doctors in a primary health care settings** are relevant. Indeed neighbouring Botswana recently implemented new alcohol policies, which involved both imposing a 70% tax on alcoholic beverages and decreasing working hours of the liquor stores as a means to curb high-risk alcohol use in the country. There is a need to also investigate how other countries are doing before similar approaches can be adapted locally. As for brief interventions provided by doctors **in a primary health care setting**, which are rather expensive to implement, this approach can become much more affordable **through task shifting to nurses** as has been demonstrated successfully by Peltzer and colleagues in rural parts of Limpopo province (Peltzer, Matseke, Aswihangwisi et al. 2008; Peltzer, Seoka, Babor et al. 2006) and through **psychological counsellors and social workers** as was done successfully in the Cape Town area by Kalichman and associates (Kalichman, Simbayi, Vermaak et al. 2007; Kalichman, Simbayi, Vermaak et al., 2008). It is recommended that the Department of Health implement these interventions as a matter of urgency.

3. Food security

Nearly a quarter of the South African population is at risk of hunger and another quarter experienced hunger. **The team strongly recommends that food security in all its dimensions must be a priority for Government, requiring that all sectors play their part in improving availability and/or access to food for everyone. A special task force or team needs to be established to look at short-, medium- and long-term food security interventions for populations in different localities.**

4. Nutritional status

The average South African diet is energy dense but micronutrient-deficient. **The SANHANES-1 Team therefore recommends intensifying the following interventions:**

- **Vitamin A supplementation for children (WHO 2011);**
- **Iron and folic acid supplementation for pregnant women (WHO 2012);**
- **Public awareness of micronutrient, dietary diversity and practices;**
- **Integrated school health programme to ensure nutrition education and provision of micro-nutrient rich meals at schools.**

In addition to the above, the Department of Health should consider medical care and special social support with intensive nutrition interventions appropriate for reducing and/or reversing the prevalence of stunting in view of the increase in the prevalence of stunting among the 0–3 year olds, which is a crucially important age group in this context.

5. Mental health

The relatively high levels of psychological distress, trauma and PTSD found in the present study are a major source of concern. This situation is greatly compounded by the marginalisation of mental health in the general population as well as also within the medical field in particular. As recommended by Mensah and Mayosi (2013), the government should **prioritise mental health and include it as the fifth major NCD**. In particular, there is a need to find ways to prevent and control mental health problems in communities. This would entail doing two things.

a) Firstly, there is a need to **address the high levels of stigma towards mental health**. This could be done through introducing on a large scale mass media and other awareness campaigns about mental health and encouraging people to go for screening of psychological distress, trauma and PTSD as recommended in the Declaration of the South African Summit on the Prevention and Control of Non-Communicable Diseases held in Gauteng from 12–13 September 2011).[1]

Secondly, and more importantly, **the dire shortage of mental health professionals in the country urgently needs to be addressed**. Apart from the need to train more psychiatrists/professional psychologists who are skilled in a more public mental health approach as was recently also called for by Parker, Allen and Lund (2013), there is an urgent need to **train more psychiatric nurses and social workers as well as community mental health workers and lay health counsellors**. The Department of Social Development should **employ more social workers to work in communities**. Just as the training of clinical associates has started, **academic institutions should revamp the training of psychological counsellors, social work assistants and mental health nursing assistants** to help deal with the mental health backlogs especially found in black African communities.

6. Quality of health care

a) The health care system is largely accessible to the population and is accessed in times of need. However, whites have financial risk protection in the form of

1 South African declaration on the prevention and control of non-communicable diseases. Gauteng 12–13 September 2011. South Africa (http://www.health.uct.ac.za/usr/health/research/groupings/cdia/downloads/SA_NCD_Declaration.pdf)

medical aid while few black Africans have such protection. Females are also less likely to belong to medical schemes compared to males. The Department of Health should **implement a universal health coverage plan (National Health Insurance) that will provide financial risk protection for all and end disparities in access to health services by race and gender.** The national health insurance policy and plan exist and are ready for implementation.

b) The finding that most of the respondents who used inpatient and outpatient public health facilities in the previous 12 months were satisfied with the services they received is encouraging, not only to the public, but also to the health care providers who often receive very negative publicity. The proportions of those who said they were satisfied ranged between 80% and 85%, similar to previous studies (Myburgh, Solanki, Smith et al. 2005, Stats SA 2011). It is also noteworthy that similar levels of satisfaction were reported from Canada.[2] This does not imply that there are no cases of poor service; the results show that they are in the minority and deserve to be attended to. Based on the study results, **the government and the media should introduce a major communication campaign to support health care providers in the public sector** by communicating in clear and unambiguous message that:

1. **most participants who used public health facilities consider health facilities to be clean, to have medicines and to have testing equipment for diagnosis,** and

2. **most participants perceived health care providers to treat them with respect, ensuring privacy, giving them a clear explanation of their presenting conditions and available treatment options, involving them in decision-making regarding the treatment options to encourage adherence, and are satisfied with the ease with which they could see a health care provider they were happy with**. It is essential that the media communicates messages that are evidence-based rather than to generalise from a few cases and paint the whole public health system as bad. While it is acknowledged that patient satisfaction is not equivalent to better health outcomes, it implies that patients are likely to use the services so that they can be screened for health problems and to treat the conditions before they deteriorate, that on its own is good enough. **It is also critical to motivate the health care workers and professionals who, in the eyes of the private and public sector users, are serving them well.** The government and the media owe it to them to give them the support that will help to sustain these high satisfaction levels.

c) The study found that the waiting times were much longer in the public health sector when compared to the private sector, suggesting that more patients need to be seen by few health professionals. In order to reduce NCD visits and waiting times at health facilities, the SANHANES-1 Team recommends introducing a combination of home-based care managed by community health workers and the use of point-of-care technology. Of the five conditions studied: hypertension, diabetes, cholesterol, cardiovascular diseases and stroke, two can be managed at home by ensuring community health workers train patients to monitor blood

2 http://www4.hrsdc.gc.ca/.3ndic.1t.4r@-eng.jsp?iid=7

pressure using a sphygmomanometer and a glucose meter to measure the concentration of glucose in the blood. The Department of Health is urged to consider purchasing these two testing devises for each patient diagnosed with one or two of these diseases and ensuring community health workers teach them how to use them and that they only go to the health facilities when necessary. This will reduce patient load at primary care facilities and reduce waiting time and also reduce the cost of health care in the long run.

7. Research and monitoring of health outcomes

South Africa is undergoing a process of epidemiological transition from infectious diseases to NCDs. Reliable estimates of population health parameters are therefore essential to understand the nature of the changing disease profile and translate such information into effective health promotion and disease prevention programmes.

The SANHANES-1 is the first of a series of surveys designed to assess the health and nutritional status of adults and children in South Africa. The survey is unique in that it combines personal interviews with standardised physical examinations, diagnostic procedures, and a variety of laboratory tests. The SANHANES-1 project combines longitudinal as well as cross-sectional design elements. One of the tasks of SANHANES-1 was to recruit and establish a nationally representative cohort of South African households to be followed up over the coming years. This prospective cohort approach will enable the investigation of the relationships between medical, nutritional and behavioural/societal risk factors assessed in the first survey phase (SANHANES-1) and subsequent morbidity, mortality and changes in risk factors determined in future survey rounds. The results provide information on a broad range of health topics and associated risk factors, which were beyond the scope of previous demographic and health surveys (DHS). Furthermore, the SANHANES-1 data address the National Department of Health's (NDOH) priority health indicators and will produce national references for key health measurements.

Overall the SANHANES-1 data will be useful in monitoring the following indicators to measure NCDs as outlined in the **Strategic Plan for the Prevention and Control of Non-Communicable Diseases, 2012–2016**:

i. Reduce by at least 25% the relative premature mortality (under 60 years of age) from NCDs by 2020;

ii. Reduce by 20% tobacco use by 2020;

iii. Reduce by 20% the per capita consumption of alcohol by 2020;

iv. Reduce mean population intake of salt to below five grams per day by 2020;

v. Reduce by 10% the percentage of people who are obese and/or overweight by 2020;

vi. Increase the prevalence of physical activity (defined as 150 minutes of moderate-intensity physical activity per week, or equivalent) by 10%

vii. Reduce the prevalence of people with raised blood pressure by 20% by 2020 (through lifestyle and medication);

viii. Every women with sexually transmitted diseases to be screened for cervical cancer every five years, otherwise every women to have three screens in a lifetime.

ix. Increase the percentage of people controlled for hypertension, diabetes and asthma by 30% by 2020 in sentinel sites; and

x. Increase the number of people screened and treated for mental disorders by 30% by 2030.

The following indicators are proposed for inclusion in monitoring progress in implementing the national strategy on NCDs as well as other health outcomes:

Indicators	Measures
Life expectancy at birth	Years to live at birth
Mortality	Maternal mortality rate per 100 000 live births
	Infant (first year) mortality rate per 1 000 live births
	Perinatal (first 14 days plus still births) mortality rate per 1 000 live births
	Child (under five) mortality rate per 1 000 live births
Non-communicable diseases	Diabetes prevalence (percentage random blood glucose > 7 mmol/L)
	Cancer prevalence
	Hypertension prevalence (BP > 140/90)
	Deaths from myocardial infarction
	Stroke deaths
	Obesity rates (percentage BMI ≥ 30 kg/m^2)
	Glucose intolerance (fasting/random blood glucose)
	Prevalence of asthma
Mental health	Suicide rates
	Prevalence of depression, stress, and anxiety
	Psychological distress, experience of traumatic events and post-traumatic-stress disorder (PTSD)
Musculoskeletal health	Prevalence of joint pain, back pain
	Prevalence of rheumatoid arthritis
Health system performance	Public perception of health services (patient satisfaction surveys)

Appendix 1: Advisory groups

Steering Committee			
Khanyisa Nevhutalu	Department of Health	Siobhan Crowley	UNICEF
Thulani Masilela	Department of Health	Seble Worku	STATSSA
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Andre Pascal-Kengne	Medical Research Council	Stanley Ntakumba	The Presidency
Debbie Bradshaw	Medical Research Council	Win Brown	USAID
Saul Johnson	DFID	Nerisa Pilime	USAID

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Pauline Kuzwayo	University of Limpopo	Marietjie Herselman	Stellenbosch University
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Refilwe Phaswana-Mafuya	HSRC	Clifford Johnson	CDC
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TB			
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Pamela Naidoo	HSRC		

Department of Health: Provincial Heads of Department (HODs)			
Dr SM Pillay	Eastern Cape	Dr DG Thys	Northern Cape
Dr Sipho Kabana	Free State	Dr Ivan Bromfield	City of Cape Town
Dr Nomonde Xundu	Gauteng	Prof Craig Househam	Western Cape
Dr Sibongile Zungu	Kwa-Zulu Natal	Ms Hilary Goeiman	Western Cape
Ms Leonore Spies	Kwa-Zulu Natal	Mr Jimmy Ledwaba	Western Cape
Ms Janet Dalton	Kwa-Zulu Natal	Mr Stephan Titus	Western Cape
Ms Daisy Mafubelu	Limpopo	Keith Cloete	Western Cape
Ms Thulisile Thabethe	Mpumalanga	Jaques Botha	SAMA
Dr Andrew Robinson	North West		

Appendix 2: List of field staff

Provincial coordinators			
Leon Davids	Western Cape	Fikile Letuka	Kwa-Zulu Natal
Nandipha Mshumpela	Eastern Cape	Musa Mkhize	Kwa-Zulu Natal
Nokuzola Manyisane	Eastern Cape	Marjorie Marule	Limpopo
Queen Kekana	Free State	Tshepo Herman Kgope	North West
Greg Molefe	Gauteng		

Trainers			
Aziza Mwisongo (HSRC)	Pamela Naidoo (HSRC)	Chantell Witten	UNICEF
Demetre Labadarios (HSRC)	Sean Jooste (HSRC)	Dhananjoy Gupta	UNICEF
Yul Derek Davids (HSRC)	Seth Mkhonto (HSRC)	Natasha Oliphant	Medical and Audiometric Sales
Gugu Mchunu (HSRC)	Thelmah Maluleke (HSRC)	Theo Nell	Stellenbosch University
Johan van Zyl (HSRC)	Whadi-ah Parker (HSRC)	Tony Bunn	MRC
Khangelani Zuma (HSRC)	Zitha Mokomane (HSRC)		
Nelia Steyn (HSRC)	Zulfa Abrahams (HSRC)		
Ntombizodwa Mbelle (HSRC)	Nolusindiso Ncitakalo (HSRC)		

Data Checkers			
Gina Weir-Smith (HSRC)	Busiswa Klaas	Neo Thantsa	Sibusisiwe Joyce Ntisa
Lucinda Dalais (HSRC)	Catherine Mashigo	Nkukluleko Masilela	Stephens Bokaba
S'bo Zama (HSRC)	Lulama Nyalambisa	Nomvuselelo Memela	Thabang Satege
Tholang Mokhele (HSRC)	Lungelwa Mase	Nonkululeko Ndubane	Thumeka Filani
Beatrice Bambo	Mashudu Tshishonga	Phumza Ruyeni	Wendy Mketo

Field Teams – Eastern Cape			
Team Leaders	Doctors		
Nomhle Febana	Dr Amanda Jongizulu	Dr Neziwe Sikela	Dr Thumeka Qanda
Mvuselelo Ncwana	Dr Ayanda Mbotya	Dr Nobuntu Songca	Dr Tyrone Moodaley
Nomonde Bery Jili	Dr Devithra Harilall	Dr Pelisa Mafuya	Dr Vuyelwa Mzukwa
Nontlahla Manona	Dr Feroz Yakoob	Dr Saadiya Seedat	Dr Zikhona Gxolo
Ntombizanele Nkabalaza	Dr Koogan Moodley	Dr Sunday Okeke	Dr Zikhona Hlalempini
Unathi Gidane	Dr Loganathan Naidoo	Dr Tandimfundo Pupuma	Dr Zingisa Sihele
Zintle Teta	Dr Lulekwa Jacobs	Dr Thandile Pupuma	
Zoliswa Mbengo	Dr Mashra Gani	Dr Thembinkosi Madangatye	

Clinic Administrators	Clinic Assistants	Nurses	
Lizwe Laurence Sihunu	Luleka Buwa	Cynthia Mzendana	Noxolo Brenda May
Mzukisi Galada	Mzuvukile Hoboshe	Mantinti Beatrice Norani	Roseline Nozibele Gqirana
Nolubabalo Mpambani	Olwethu Jojwa	Nobahle Virginia Mango	Sylvia Gunya
Songezo Sombinge	Phaphama Mtshelu	Nocawe Williams	

Vukile Mcebisi Goba	Sandisiwe Silotile	Nombulelo Koliswa Penxa	
Xoliswa Tyalakhulu	Yoliswa Mzilikazi	Nompinda Gantsho	
Zoleka Lillian Kamana	Zimasa Milisi	Nomvuzo Rozani	

Fieldworkers			
Ayanda Daniso	Lwazi Mluma	Nosiviwe Grootboom	Sibongile Ngesi
Ayanda Yolani	Neels Alberts	Ntombikayise Madywadi	Siphokazi Brown
Babalwa Vanessa Brown	Nokwanda Ndiki	Patricia Nothemba Galada	Thandile Margaret Ntinganti
Bongani Daba	Nomampondomise Mrwetyana	Phelokazi Mbete	Thandiwe Dada
Cindy-Ann Liezel Booysen	Nonke Doyi	Phindiwe Yose	Vuyokazi Tokwe
Dirk van der Bank	Nonzuzo Duka	Phuthukezi Baskiti	Wendy Allen
Fikiswa Nobala	Nopasika Mtwa	Pumzile Maphuma	Zikhona Maxazana
Linda Mbuthini	Nosicelo Maguzu	Sibongile Mabuto	

Field Teams – Free State

Team leaders	Doctors		Nurses
Andries Majoro	Dr Moramang Kgwesha	Dr Grace Chauke	Cathy M Mbeki
Kamohelo Mokhemisi	Dr Thabonyana Nkhobo	Dr Mahlomola Banyan	Mamakololo Semokonyane
Kethabile Setshedi	Dr Charles Mtembu	Dr Lemponang Monethi	Magauta Ramotsehoa
Lerato Ramoji	Dr P Moletsane	Dr Frans Mokomane	Sophia Tshabalala
Moodehi Masiu	Dr Lebeko Ntsepe		Funny ntoi
Mphutlane John Ntsane	Dr David Mkwanazi		

Clinic Administrators	Clinic Assistants	Fieldworkers	
Lebogang Saila	Evodia Matsie Liphoko	Dikeledi Joyce Moseme	Moratehi Masilo Joseph
Lerato Stanley	Lelanie Badenhorst	Leoma Rabohlale	Mpho Mohlatsane
Mamokete Monica Lekgari	Makalo Kheo	Mahlomola Lebusa	Nthabiseng Mphahlela
Mathapelo Olga Mokete	Mary Mapulane Mosia	Malejlaha Sarah Radimo	Nyakallo Mokgalemela
Nthabiseng Khabele	Moyahabo Mapunya	Mamosa Sylvia Ntholeng	Phole Morgan Ditabe
	Ntelane Bethuel Kuleile	Maria Paile Masiu	Sello Orbed Mosia
	Thenjiwe Motaung	McDonald Van Schalkwyk	Tebello Prudence Mofokeng
		Modiehi Moloi	Tshoaneng Makoatsane
		Moleboheng Moseme	Tumisang Botsime
		Monica Lukas	Tumo Mashiya

Field Teams – Gauteng

Team Leaders		Doctors	
Justice Masala Sethu	Mxolisi Tiki	Dr Annah Amos	Dr Kantilal Vallabh
Kagiso Mochela	Nkosinathi Ngwenya	Dr Barnabas Khumalo	Dr Michelle de Bruyn
Kagiso Mokwena	Sebane Mkwanazi	Dr Daniel Segai Mogafe	Dr Michelle Smit
Kenneth Geelbooi Kgosana		Dr Godfrey Chauke	Dr Nosisa Matsiliza
Lucky Nqala		Dr Ignatius N Mabuza	Dr Segai Mojapelo
Lumkile Grootboom		Dr Irene Ntuli	Dr Shenaaz Mohammed

Mantseng Monareng		Dr Joseph Mangwane	Dr Vuyelwa Vatsha-Mahlaba
Mashila Maluleke		Dr Joseph Thabo Mnisi	

Clinic Administrators	Clinic Assistants	Nurses	
Beatrice Bambo	Akhona Maseme	Amania Mitah Madiba	Rebecca Mantau Motumo
Catherine Mashigo	Ayanda Mohlamonyane	Angeline Mathole	Thembeka Lydia Nhlapo
Elizabeth Lebelo	Cameron Mathumba	Dellien Modise	Zodwa Rose Moroke
Kagiso Abram Segoale	Mamiki Mathebula	Evelyn Kgabo	
Patric Tshepo Maphoso	Philisiwe Mondlolo	Francina Rakgoadi	
Philisiwe Olivia Mondlane	Sibongile Mahlangu	G Maluleke	
Sandra Walker-Dlamini	Stephens Bokaba	Joyce Mahuntsi	
Tebogo Charlotte Boikanyo		Kgabo Mashalane	
Thabang Satege		Patricia Sepamla	

Fieldworkers			
Bridgette Motau	Keneilwe Marobela	Nicholas Selobe Ledwaba	Thandeka Makhoba
Dingaane Makhubele	Kgaogelo Kgomo	Nkoketseng Mokgopye	Thingahangwe Mulaudzi
Edith Kgwele	Khensani Baloyi	Nthabiseng Mphuthi	Thokozile Malinga
Felleng Mankheli	Lindokuhle Malinga	Ntombizodwa Menemene	Tshegofatso Seema
Fezile Nonjiko	Mandisa Zondi	Precious Mudau	Veronica Masina
Gloria Mabizela	Mandla Sylvester Malinga	Refilwe Makubu Malope	Vutlhari Maluleke
Irene Mashele	Mashale Joseph Marutla	Rinah Kediemetse Mashishi	Xaveleni Ezra Shikwalakwala
Itumeleng Motaung	Mhloti Elizabeth Mokansi	Sharon Mekoa	Ziningi Xaba
Jabulisile Maseko	Miehleketo Maluleke	Sibusiso Fayilani	
Joseph Mavutla	Mlungiseleli Liberman Zitha	Sophie Manyadi	
Julia Mankheli	Mmatebogo Mokhachane	Thabo Lebohang Langa	

Field Teams – KwaZulu-Natal

Team Leaders		Doctors	
Bongumusa Ntsele	Samukelisiwe Manda	Dr Abdool Shaik Karim	Dr Nombuso Zulu
Colin Pather	Sanelisiwe Patience Jali	Dr Charles Mtembu	Dr Nonhlanhla Chonco
Nazihah Khan	Sbusiso Mseleku	Dr Ebenezer Mpunzana	Dr Raj Ramlutchman
Nkululeko Freedom Manzi	Siyabonga Isaac Langa	Dr Ismail Omar	Dr Sibusiso Ndlovu
Penelope Mbalenhle Msweli	Tracey Maswazi Sibisi	Dr Johan During	Dr Sibusiso Simelane
Phumlani Dlamini		Dr Njabulo Ntombela	

Clinic Administrators		Clinic Assistants	
Brian Xaba	Nkosiyazi Shaun Makhanya	Hlengiwe Mhlongo	Selisha Dhanapal
Mfanafuthi Ndlovu	Nomathemba Purity Mbuyazi	Jabulile Hlatshwayo	Thandeka Sithole
Naomi Ramlugan	Percy Mohlakoama	Noluthando Sithole	Wendy Xolile Xulu
Ndlela Bryce Mhlengi	Sibusiso Mtshali	Philisiwe Gcwensa	Winnie Busisiwe Masondo
Nduduzo Victor Mchunu	Sinqobile Philile Mngadi	Philisiwe Juliah Ngcobo	Zanele Mabel Mthethwa
Nurses	**Fieldworkers**		
Lindiwe Mathe	Basithile Dlamini	Mthunzi Mseleku	Sheraazna Papiah

Lindokuhle Zakwe	Brian Khulekani Mazibuko	Munsamy Naidoo	Sibongile Dlungwane
Margaret Themba Manaka	Dumisani Rodney Zaca	Mxolisi Ndlovu	Sibongiseni Zondi
Pansy Dlamini	Hazel Pinky Ntuli	Mzwandile Thwala	Simangele Buthelezi
Phumzile Zungu	Hlengiwe Maluleka	Nazira Ismail	Sizakela Yvonne Msomi
Princess Mkhize	Khethabahle Mgaga	Nolwazi Ngcobo	Thabile Charlotte Khwela
Rosemary Ngubane	Khululiwe Hlekwayo	Nolwazi Ngidi	Thabisile Makhathini
Simphiwe Mabaso	Noluthando T Kwela	Nontobeko Portia Mthembu	Thabiso Mcinga
Thoko Meyiwa	Londiwe Gumede	Nosipho Fortunate Nzaca	Thamsanqa Evans Ngubane
	Lumka Bridget Ngcobo	Patience Nolwazi Ngcobo	Thandazile Abigail Memela
	Lungile Langa	Phumla Sokhela	Thembani Shintshile Mhlongo
	Sandile Mandla Mthalane	Precious Cele	Zinhle Madonsela
	Moses I Malwane	Sagree Gounden	Zwelakhe Dlamini
			Winnie Busisiwe Masondo

Field Teams – Limpopo

Team leaders		Doctors	
Fumani Maluleke	Rhulisani Kubayi	Dr Frans Rasweswe	Dr JJ Mnisi
Kgau Monare	Solomon Mphiwa Setsiba	Dr HJ Ngobeni	Dr Mashilo Kgathi
Lebogang Magwaza	Vutomi Makhikhi	Dr HJ vd Westhuizen	Dr Thabo D Pilusa
		Dr Hlengani J Maluleke	Dr Thandiziswa Filio Tshoba

Clinic Administrators	Nurses		Clinic Assistants
Albertinah Baloyi	Agnes Radzilani	Maria Mankgale Hlaka	Francinah L Mathabatha
Constance Shabangu	Dikeledi Elizabeth Rankapole	Susan Pholoba	Mikateko D Maluleke
Mpolae Ivy Kekana	Dora M Mathebula	Sylvia Dibakwane	Pretty Nonyane
Rebecca Nkhensani Mnisi	Fasiwe Mathye		Shishenge Tshikani Masehla
Rhofiwa Khuliso Mulaudzi	Magdeline Ramunenyiwa		Sibingile Mahlangu
Yoliswa Mercedes Sherazi	Mantini B Norani		Zandile Mthisi

Fieldworkers			
Bafaletse Jan Mfisa	Eunice Morema	Mackson Mndawe	Sheila Patience Mathibela
Daphne Manabe	Jeffrey Humbulani Mawela	Martha Letsoalo	Tshepo Hermina Dube
Elelwani Nemathaga	Jesta Nyeleti Mashava	Mikateko Rikhotso	
Essayo Vincent Mhlongo	Joy Tshameleni Khoza	Remember Gumede	
Euginia Seemole Mashoshane	Maamatsi Mametja	Salvador Vumbhoni Baloyi	

Field Teams – Mpumalanga

Team leaders	Doctors	Clinic Adminstrators	Clinic Assistants
Clifford Mashigo	Dr Dennis J Mkhulisi	Jabulile Mtungwa	Lizzy Mdluli
Owen Ndhlovu	Dr Jean Marais	Maries Marshall	Nonhlanhla Mathebula
Sthembiso Mkwanazi	Dr Themba Lokothwayo	Nonhlanhla Mathebula	Sheila Sthembile Lamula
Thami Madonsela	Dr Joseph T Mnisi	Sibongile Masango	Shirley Mokgope
William Skhosana			Sibongile Mahlangu

Nurses		Fieldworkers	
Amania Mitah Madiba	Sindisiwe Mabuza	Ayanda Mthembu	Mmathapelo Moyo
Basi Jabu Mhlanga	Sylvia Dibakwana	Benedict Malope	Nozipho Mutileni
Christina Petronella Wilson	Zodwa Mahlathi	Busisiwe Khowane	Patricia Raseroka
Cynthia Mabuza		Elsie Malerotho	Sello Phoku
Kiekie Mashaba		Kitty Bayana	Tebogo Meidens Wattie
Sibongile Mnisi		Lucindus Amanda Moyo	Trecia Memory Ngomane
		Mantsitle Thonia Mafokwana	Xoliswa Mbazima
		Melusi Dube	

Field Teams – Northern Cape

Team leaders	Doctors	Clinical Administrators	Clinic Assistants
Obakeng Philemon Mjoli	Dr AS Noonari	Alan Bam	Ashura Davids
Rorisang Peme	Dr Casper van Aardt	Dorah Kilelo	Charmaine Walters
Samuel Sipango	Dr Ferdinand Mampuya	Marilyne Moseki	Felicia Bagnall
Stoffel Stal	Dr Lelethu Bango	Neo Brenton Lekgwathi	Matshidiso Sylvia Lande
Theo Cwaile Mooketsi	Dr Mpho Bantobetse		Mazelle Layani Saane
Catharina van Huysteen	Dr Talat Habib		Sandra Veronica Phillips
	Dr Funeka Carol Madikiza		

Nurses	Fieldworkers		
Gloria Mojamongwe	Boitumelo Montwedi	Keyonethebe Kulukwane	Raymond Spagen
Ivan Botha	Disebo Primrose Tume	Lesedi Tswaile	Refilwe Given Moseki
Ruth Keodumetse France	Jan J Hendricks	Lorraine Lewies	Ricardo Coetzee
Salvation Borake	Johanne Johnny Seleke	Lukhanyo Faniso	Walter Mogoregi
SD Mohulatsi	Kabelo Simon Matlhoko	Olebogeng Licoln Peme	
Zuleika Kolia			

Field Teams – North West

Team leaders	Doctors	Clinic Administrators	Nurses
Kagiso Mochela	Dr Dennis Mkhulisi	Francinah Masisi	Amania Mitah Madiba
Kamogelo Masemola	Dr Irene Ntuli	Johannes Shongwane	Cathy Mbeki
Kenneth Geelbooi Kgosana	Dr Isaac Moeti Siko	Lebogang Mpete	Ingrid Lekoma
Khelebogile Kgobane	Dr Johannes T Maaga	Lerato Molefe	Olivia Matlhola
Lumkile Grootboom	Dr Joseph Mangwane	Patric Tshepo Maphoso	Patricia Sepamla
Nomsa Sphika	Dr Joseph Thabo Mnisi		Simon Choabi
	Dr Segai Mojapelo		
	Dr Vuyelwa Vatsha-Mahlaba		

Clinic Assistants	Fieldworkers		
Ayanda Mohlamonyane	Boitumelo Violet Sefako	Kearabetswe Ramosepele	Selebogo Maria Leseyane
Carol Maribeng	Dikgale Maepa	Keneilwe Marobela	Sharon Motlhabane
Mamiki Mathebula	Dipuo Zondo	Kgaogelo Kgomo	Sibusiso Fayilani
Sharon Mokwele	Gayden Gugulethu Mvuka	Makubu Refilwe Malope	Thabo Macmillan Baloyi

Sylvia Biopelo Disetlhe	Gloria Mabizela	Nicholas Ledwaba	Thandeka Makhoba
	Itumeleng Motaung	Piet Thamaga Letshabo	Tshegofatso Ellen Boshielo
	Johannes Masitela	Rinah Mashishi	Tshegofatso Lisbeth Monosi

Field Teams – Western Cape			
Team leaders	Doctors	Nurses	Clinical Assistants
Catharina van Huysteen	Dr Casper Van Aardt	Farieda Adams	Ashura Davids
Raymondo Luiters	Dr Errol Visser	Gerda Burger	Charmaine Walters
Rodney Regter	Dr Funeka Carol Madikiza	Marylynne Williams	Elvita Adonis
Ryno Zimri	Dr John Patrick Hayes	Miriam Bilski	Felicia Bagnall
Samuel Sipango	Dr Mokete Setoaba	Priscilla Mahangu	Kristen Fuller
Stoffel Stal	Dr Nicholas Lee	Rasheeda Heyns	Leanne Khanyisa Sindinile
	Dr Nqulelwa Mzana	Salvation Borake	Tamryn Murray
	Dr Pumla Mawisa	Sylvia Zondeka	Xhanti Christian Gum
	Dr Simone Groenewald	Zimasa Siyancela Mkobo	
		Zuleika Kolia	

Clinic Administrators	Fieldworkers		
Alan Bam	Asanda Booi	Jan Jacobus Hendricks	Nkululeko Pelem
Andre Cruywagen	Bahia Davids	Jerome Joshua Africa	Nomfundo Mbolekwa
Carlynn Daniels	Brehelda Klaase	Leigh Armstrong	Phumza Portial Phondoyi
Faiqka Diedericks	Bulelani Ngaye	Londiwe Gomba	Ricardo Sheldon Coetzee
Leon Lional Ludick	Chantelle Le Fleur	Lorraine Jeanetta Lewies	Sasha-lee Judy Simons
Remo Bronn	Craig Gabriel Valentine	Louis-Jason Adams	Shavario Van Wyk
Tiana Van Rensberg	Eduardo Ulrich Meyer	Lukhanyo Faniso	Thozama Mbobo
	Elfriedo Lucien Jantjies	Masnoena Davids	Walied Abrahams
	Elrique Heynes	Moegamat Shamiel Mallick	Wardah Williams
	Eustace Jacobs	Moegamat Zaheer Mallick	Yandiswa Mtwana
	Faldeelah Petersen	Natasha September	
	Jabulani Sonyoka	Nawaal Mallick	