

National HIV incidence estimates: an analysis of current transmission dynamics in South Africa

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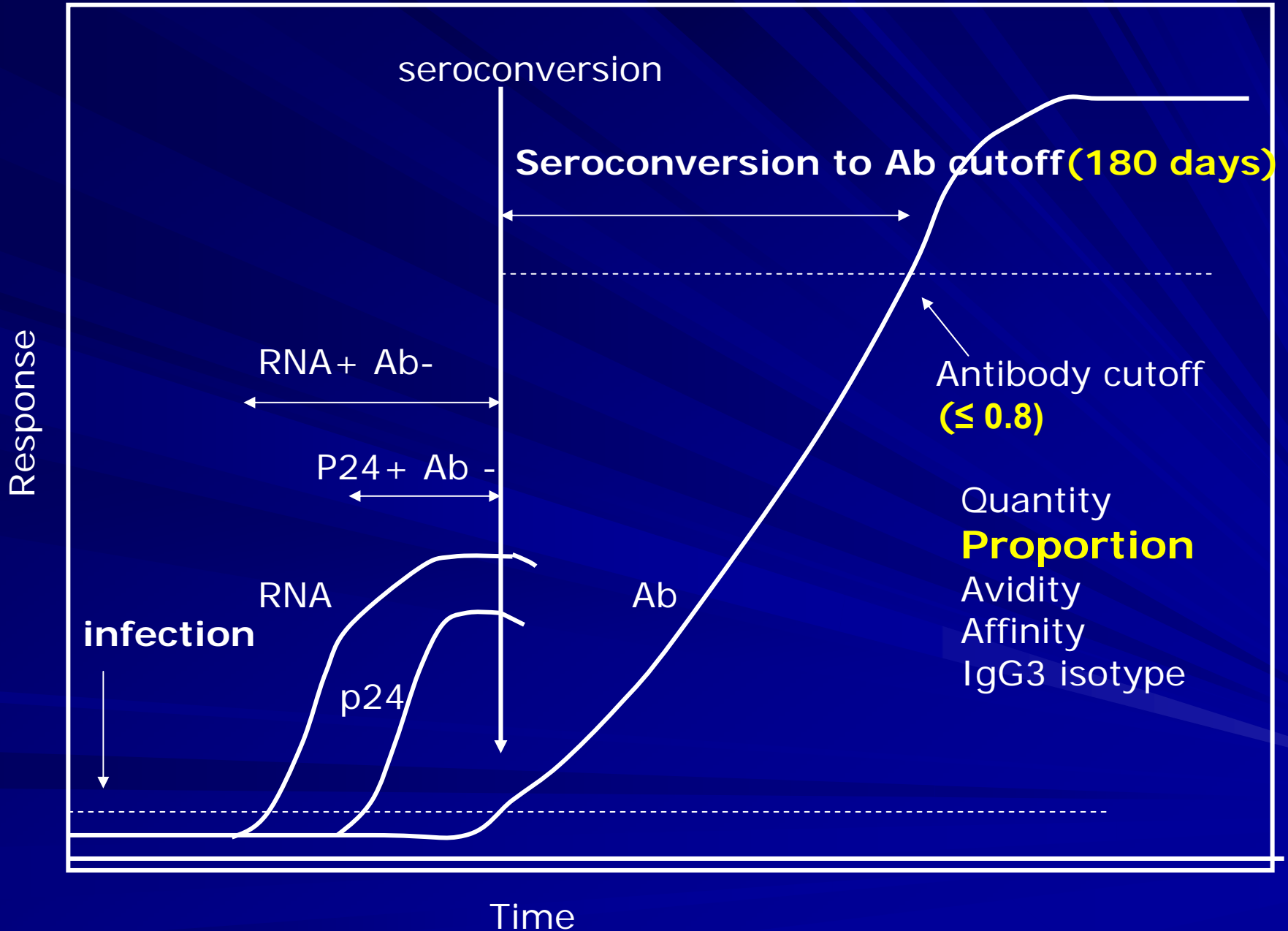
Measuring HIV incidence

- **Epidemiological methods**
 - Cohort studies (*directly observed incidence*)
 - HIV prevalence in youngest age group (15-20)
(*as a proxy for recent infection*)
 - Mathematical modeling (*indirect incidence estimate*)
- **Laboratory- based methods**
(direct incidence measure from cross-sectional surveys)

National HIV Household Survey South Africa 2005

- **Study population: 2 years and older**
- **Anonymous HIV testing of dried blood spot specimens**
- **HIV prevalence and HIV incidence**
- **Final sample: 23 275 interviewed, 15 851 tested for HIV**

HIV-1 BED incidence EIA (adapted from B. Parekh et al. 2002)



BED HIV incidence calculation

$$I = \frac{F (365/w) N_{inc}}{N_{neg} + F (365/w) N_{inc}/2} \times 100$$

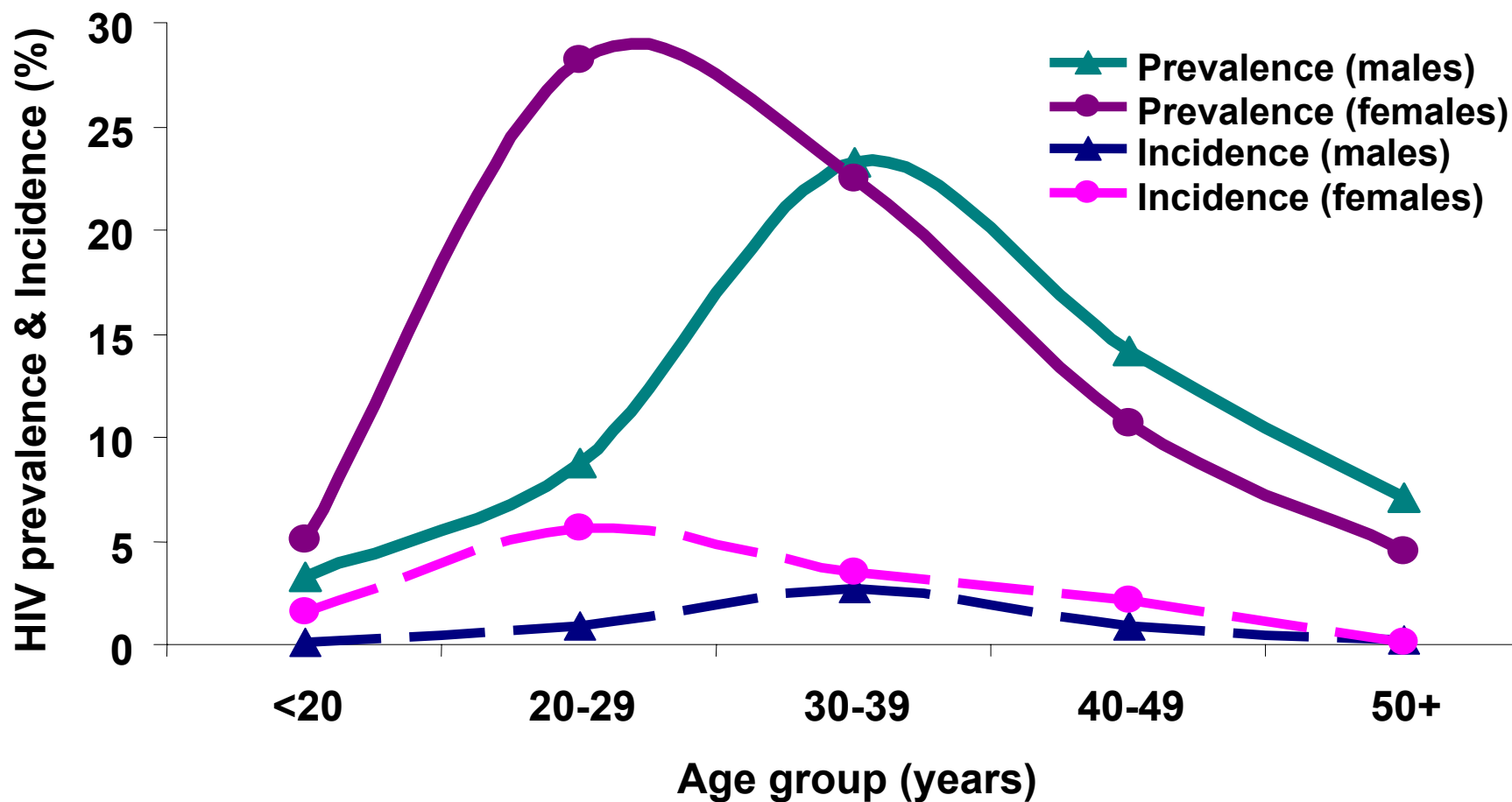
$$\text{Adjustment Factor} = \frac{(R/P) + \gamma - 1}{(R/P) (\alpha - \beta + 2\gamma - 1)}$$

(McDougal)

Window period = 180 days

Incidence = number of new infections per year per 100 persons at risk (% / year)

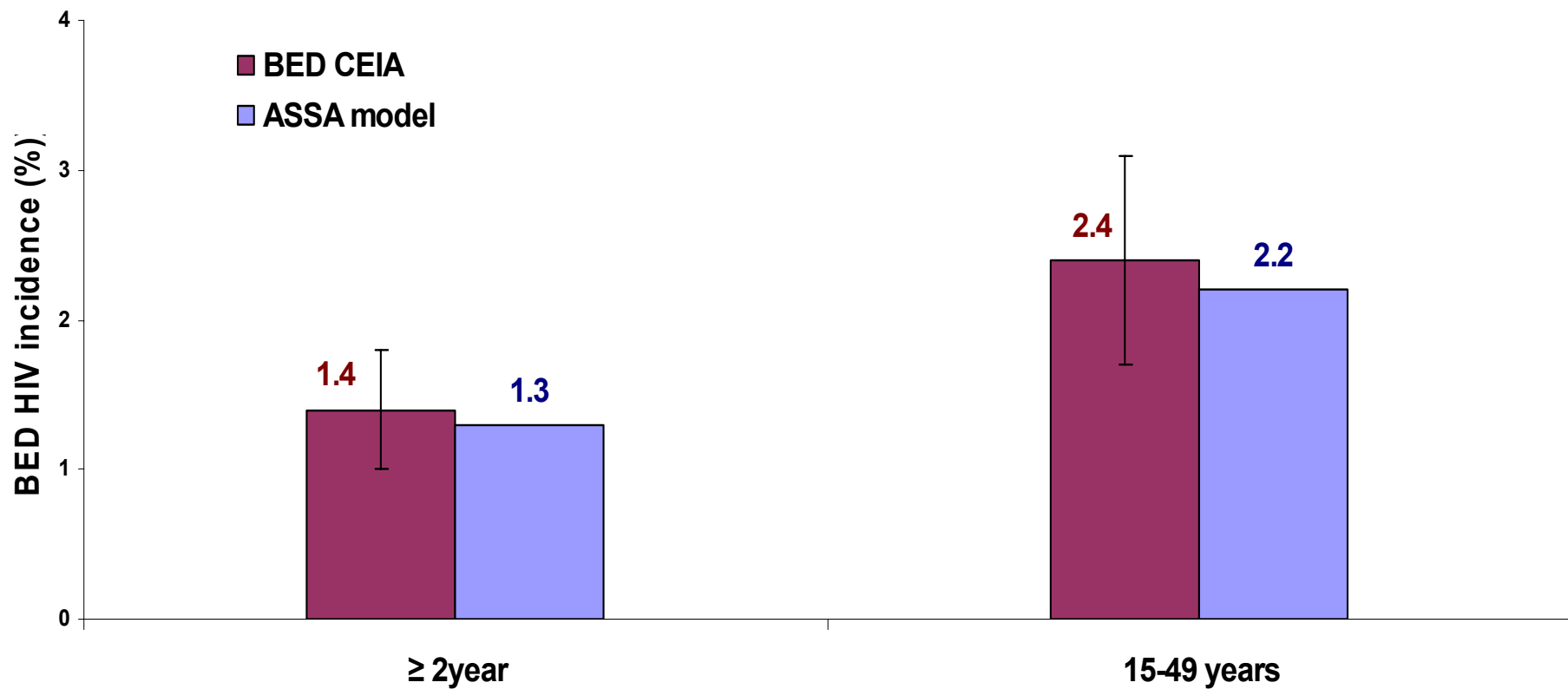
HIV prevalence and HIV incidence by age and sex, South Africa 2005



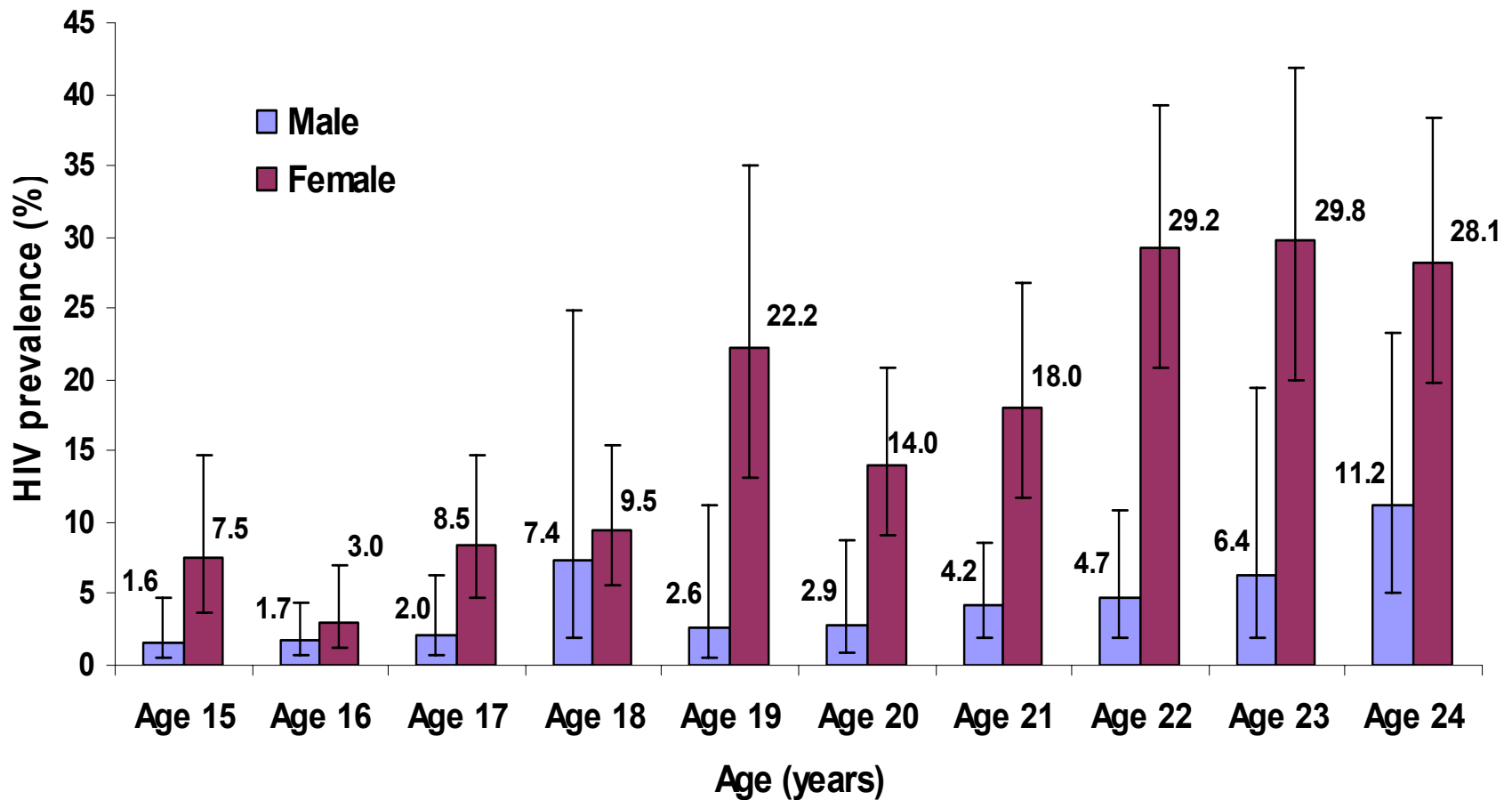
HIV incidence % and number of new infections by age group, South Africa 2005

Age group (years)	Weighted sample (n)	HIV incidence % per year [95%CI]	Estimated number of new infections per year (n)
≥ 2	44 513 000	1.4 [1.0 - 1.8]	571 000
2-14	13 253 000	0.5 [0.0 - 1.2]	69 000
15-24	9 616 000	2.2 [1.3 - 3.1]	192 000
15-49	24 572 000	2.4 [1.7 - 3.2]	500 000

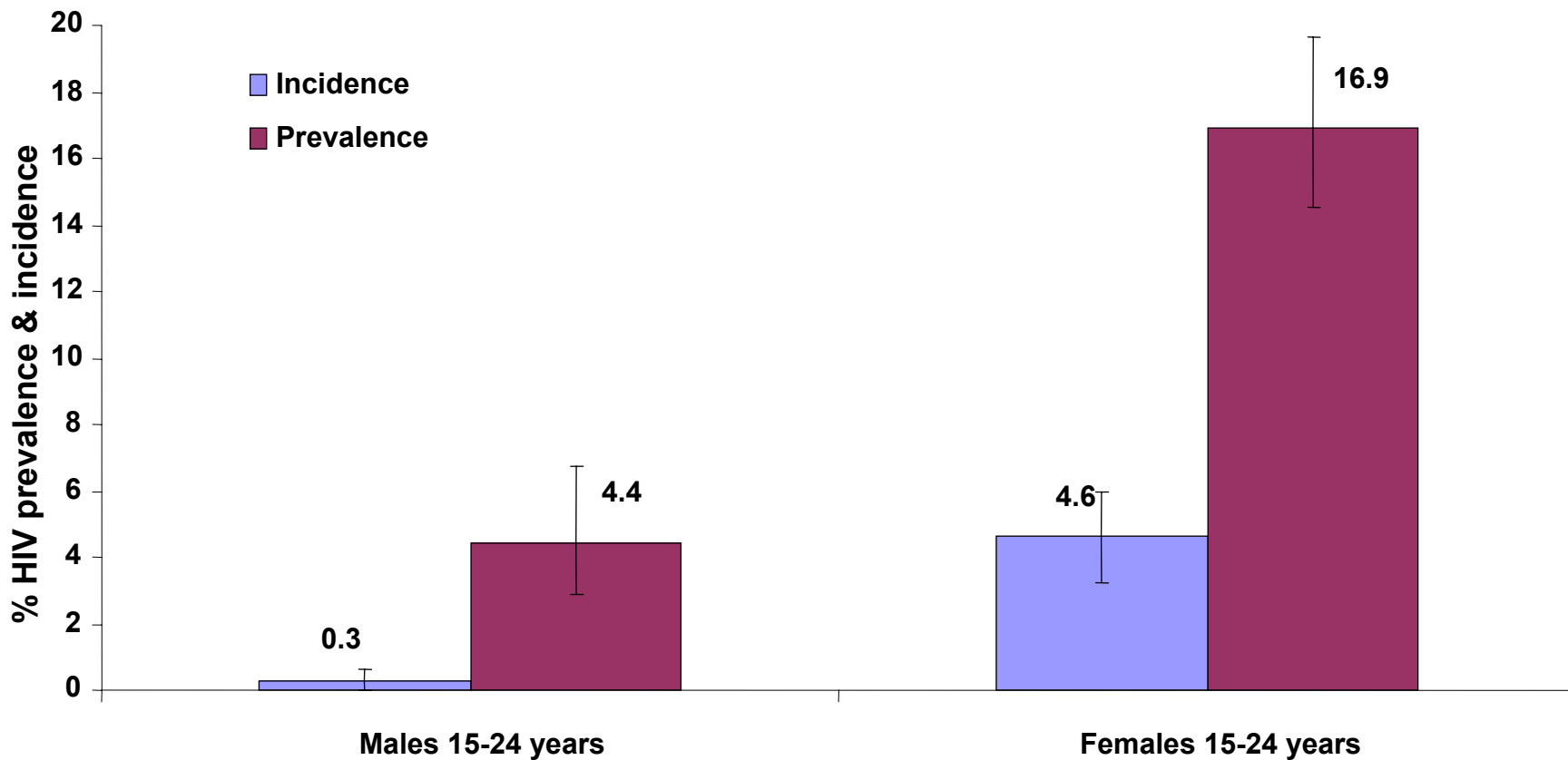
BED HIV incidence vs ASSA model (estimates for 2005)



HIV prevalence in youth by single year of age South Africa 2005

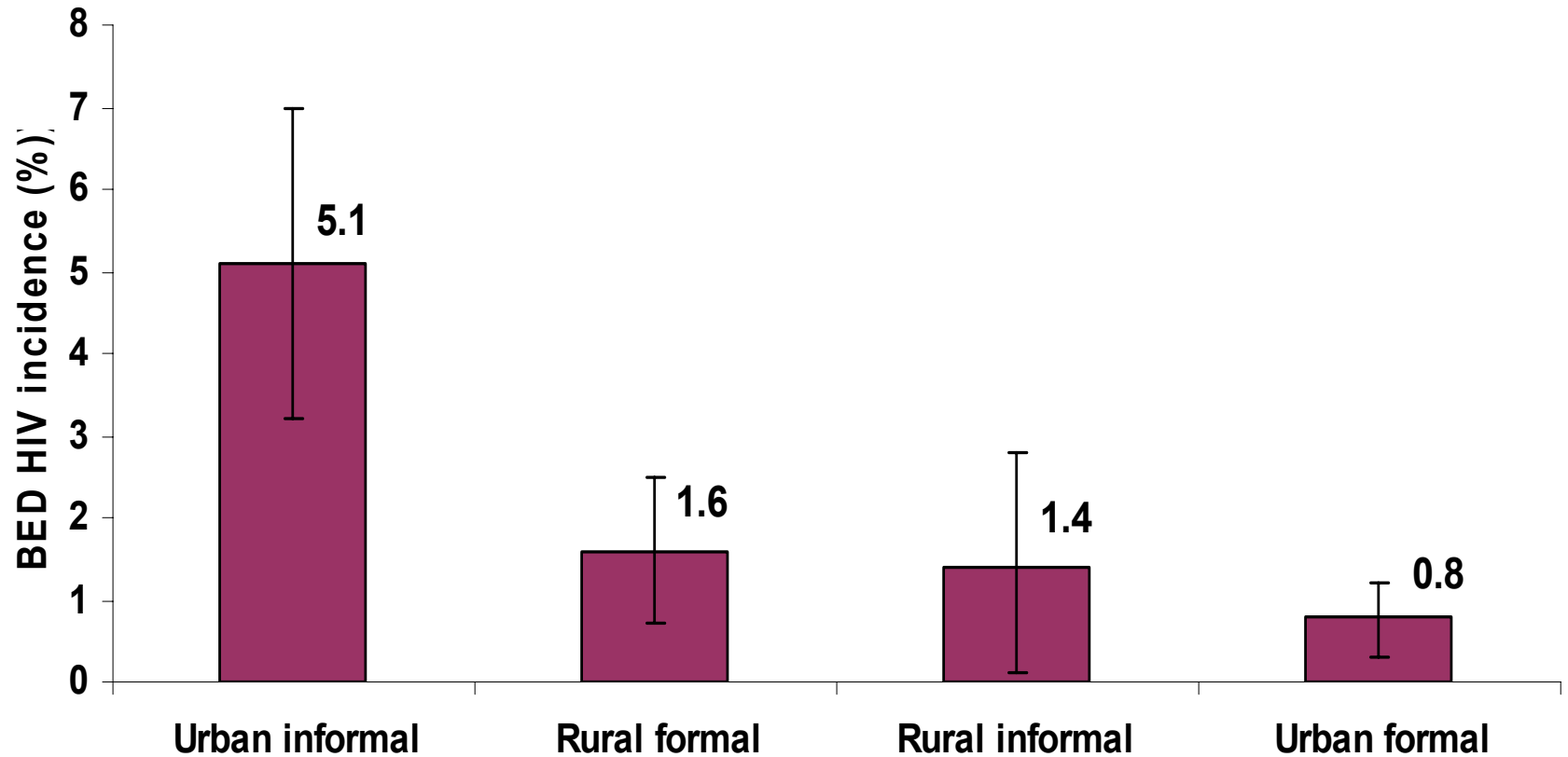


HIV prevalence and HIV incidence in youth aged 15-24 years, South Africa 2005



HIV incidence by locality type

South Africa 2005



HIV incidence and behaviour

South Africa 2005

Variable	HIV incidence (% per year)
<i>Marital status</i>	
Single	3.0
Married	1.3
Widowed	5.8
<i>Sexual history</i>	
Sexually active in the past 12 months	2.4
Current pregnancy	5.2
<i>Condom use at last sex (15-24 yrs)</i>	
Yes	2.9
No	6.1

Conclusion

- **Incidence estimates enable a more timely analysis of the current HIV-transmission dynamics**
- **The adjusted BED HIV incidence estimates provide valid national HIV incidence estimates for South Africa**
- **Prevention campaigns did not have the desired impact, particularly among young women**