

**National HIV prevalence and
behavioural risks household surveys
2004-2005 in four Southern African
countries (SADC – Member states)**

Implemented by
**Human Sciences Research Council (HSRC),
South Africa**

Presentation to the SADC-EU Workshop on Sharing and
Transferring Lessons learnt in implementing the SADC/EU
Regional Multi-Sectoral Projects on HIV and AIDS held at
Grand Palm Hotel in Gaborone, Botswana on 19 -21
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HSRC RESEARCH OUTPUTS

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Outline of presentation

- 1. Background**
- 2. The overall aims of the project**
- 3. Specific objectives**
- 4. Major steps involved in project implementation in each country**
- 5. Achievements**
- 6. Challenges**
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Background

- For any country to respond effectively to prevent new infections and provide care and treatment to those who are already living with HIV/AIDS, it is vital to have accurate data and a comprehensive understanding of the epidemic.
- Both in 2005 and 2006 the United Nations Joint Programme on HIV/AIDS (UNAIDS) revised downwards the estimated total number of people living with HIV/AIDS found globally and especially in Sub-Saharan African countries.
- The rationale for the change is that they have been major improvements in surveillance methods currently being used in various countries.

Background (contd)

- Two main methods used in surveillance as well as M & E of national responses are:
 - Previously mainly the antenatal sentinel clinic surveys based on pregnant women usually done annually or biennially.
 - Recently also household-based surveys on the general population usually done on 15-49 as part of the DHS+s conducted by ORC Macro International.
- The two methods have yielded different estimates of HIV prevalence rates depending on the maturity of the epidemic (i.e., whether it is generalised or concentrated among some high risk groups).

Antenatal vs Population-based surveillance methods

Antenatal	Population-based
<p>Obtained from pregnant women attending ANC clinics</p>	<p>Collected from households</p>
<p>Rural population likely to be excluded</p>	<p>Likely to have a higher non-response rates</p>
<p>Exclude population in institutions</p>	<p>Exclude populations in institutions</p>
<p>All women are tested</p>	<p>Includes only those who agree to be tested</p>
<p>Excludes men, children</p>	<p>Includes children, men and non-pregnant women</p>

The method used by UNAIDS/WHO to estimate HIV-1 prevalence from antenatal clinic (ANC) data

- Use a curve-fitting approach with all available data over time to develop an estimate of prevalence for pregnant women in urban and non-urban areas
- Adjust the median HIV-1 prevalence in non-urban sites down by 20% because of under-representation by remote rural clinics
- Assume that HIV-1 prevalence in pregnant women is a good proxy for prevalence in all adults aged 15-49 years
- Calculate the national estimate of HIV prevalence by weighting urban and rural estimates
- Assume that the female-to-male ratio of HIV-1 prevalence is 1.2 to 1
- Calculate HIV-1 prevalence in men and women from the national estimate

Source: Boerma, TJ, Ghys, PD & Walker, N. (2003). Estimates of HIV-1 prevalence from national population-based surveys as a new gold standard. *Lancet*, 362, 1929-1931.

**Comparisons between HIV prevalence rates
based on ANC- and population-based surveys
found in some African countries**

Country	UNAIDS/WHO (15-49 years)	Pop.-based survey (15-49 years)
Mali 2001*	2.1%	1.7% (2% women vs. 1.3% men)
South Africa 2002**	20.1%	15.6% (17.7% women vs. 12.8% men)
Zambia 2001/2*	21.5%	15.6% (17.8% women vs. 12.9 % men)
Kenya 2004*	9.4%	6.7% (8.7% women vs.4.5%)

* DHS+ **HSRC

The overall aims of the project

- **To provide TA to and/or promote TC with researchers from four SADC member states (viz., Botswana, Lesotho, Mozambique, and Swaziland) to undertake their own national HIV prevalence and behavioural survey research using both the**
 - **second-generation surveillance approach and**
 - **population-based cross-sectional survey methodology.**

The specific objectives

1. To provide some TA to and/or TC with researchers in each of the four SADC states to achieve the following:
 - completed research design and sampling
 - completed data collection of high quality standard
 - data analysed
 - report prepared
2. To prepare a report on experiences learned in the four SADC countries and South Africa to be used as a guide for undertaking HIV/AIDS surveillance based on population-based surveys in the rest of the SADC member states.

Main Result Areas

The four results areas in each country were:

- | One | Two | Three | Four |
|--|--|--|---|
| <ul style="list-style-type: none">• Protocol for the study completed• Sample designed and sample drawn• Sample drawn within each household | <ul style="list-style-type: none">• Questionnaire development• Training• Data collection• HIV testing | <ul style="list-style-type: none">• Data tracking and capturing• Data editing and cleaning• Data analysis using accurate methodology | <ul style="list-style-type: none">• Report writing• Analysing results• Effective dissemination and publishing |

Major steps involved in project implementation in each country

- **Introducing and sensitising countries to these kinds of surveys based on our experience in South Africa and DHS+ surveys in other African countries such as Kenya.**
- **Obtaining country consensus and country ownership**
- **Providing the following technical assistance to countries:**
 - ***Multi-sectoral Steering Committees***
 - ***Research teams, drawing on country expertise***
 - ***Implementation of the survey***
 - ***Analysing and dissemination of survey data***

Achievement 1 : Botswana

- TC with NACA- & CSO-led team of researchers on the Botswana AIDS Impact Survey II (BAISII) starting with
 - development of the protocol using HSRC model especially with regard to
 - ✓ HIV testing biomarker issue (Orasure) and
 - ✓ all ages (including children aged 2-14 years and elderly aged 55+ years)
 - assisted in particular with data cleaning and preliminary data analysis

Achievement 1: Botswana (contd)

- The statistical report was finalised and released on 2-3 November 2005
- CSO and NACA also released the final popular report later.
- The country has widely disseminated and utilised the data to help with planning their national response to the HIV/AIDS epidemic.
- The country also funded the entire project mainly from its own resources.

HIV prevalence statistics, Botswana 2005 (Source: BAISII, 2005)

Age group (Years)	Negative	Positive	Total	Prevalence rate (%)
1.5-4	70033	4748	74781	6.3
5-9	117115	7514	124629	6.0
10-14	106549	4281	110830	3.9
15-49	377621	127594	505215	25.3
50+	99593	14935	114528	13.0
All	771050	159133	930183	17.1

Achievement 2: Guide for undertaking HIV/AIDS surveillance based on population-based surveys.

- Working together with UNAIDS and WHO-Afro, the HSRC contributed to the following publication as part of this project to be used as a guide for undertaking HIV/AIDS surveillance based on population-based surveys in other countries including SADC member states :
 - UNAIDS/WHO Working Group on Global HIV/AIDS and STI Surveillance (2005). *Guidelines for measuring national HIV prevalence in population-based surveys.* UNAIDS/WHO: Geneva.

Challenge 1: Swaziland

- **Most of 2004 and 2005 was spent working closely with Swazi researchers, CSO and MoH with ORC Macro International to**
 - **prepare protocols for DHS++ (= integrating DHS+ plus HSRC model for 2+ years age groups and elderly aged 50+ years)**
 - **various research survey instruments for both trademark DHS and HIV/AIDS surveys based on the HSRC questionnaires**
 - **ethical approval by CDC took rather long to obtain until April 2006.**

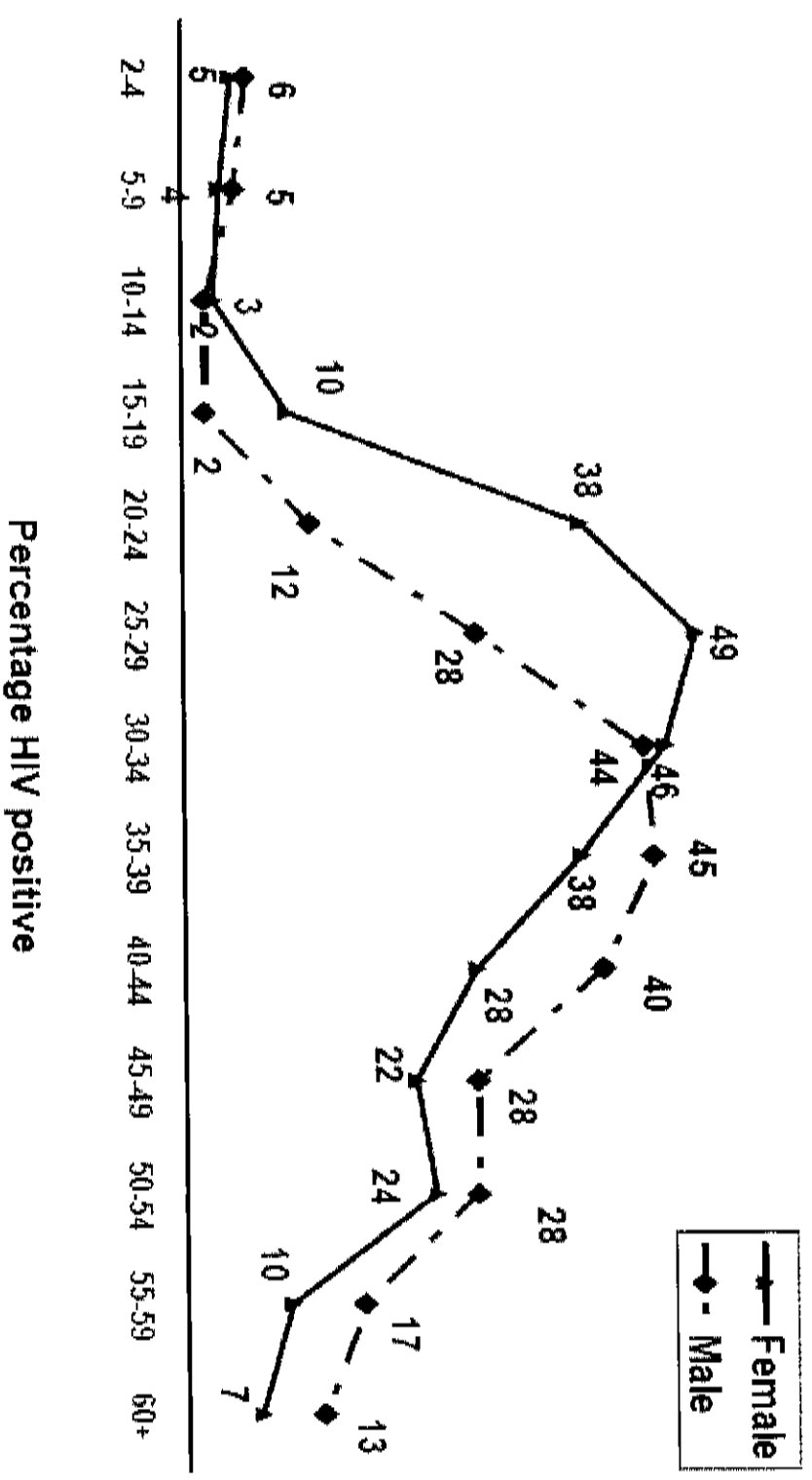
Challenge 1: Swaziland (contd)

- **HSRC led consortium assisted with planning of building of laboratory capacity especially training of staff on DBS based HIV antibody testing with the help of a SA based laboratory contracted by HSRC from its 2005 study.**
- **The Government of Swaziland allocated US\$1million to the project and another US\$250000 has been raised from donors.**
- **HSRC contributed some stock for HIV testing equipment from its 2005 study.**

Challenge 1: Swaziland (contd)

- Both the training of fieldworkers and the pilot study were conducted in August 2005 with our consortium's participation as partners.
- The main survey was in the field during the second half of 2006 and was completed early this year.
- A preliminary report including on HIV prevalence among all age groups was published in June this year.
- Thus, the main objective was achieved, albeit after the end of the project.

Figure 2 HIV Prevalence among Population Age 2 and Older by Age and Sex



Challenge 2: Mozambique

- **After a strong start in late 2004 and early 2005, progress stalled in late 2005 for the following reasons:**
 - **the local Steering Committee had to sell the idea of population-based second-generation surveillance approach to important stakeholders.**
 - **there was also a change of government leadership such as PM and Min of Health.**
 - **elections further delayed the formal start of the formative research fieldwork project.**
 - **there were enormous resource constraints due to lack of financial resources.**

Challenge 2: Mozambique (contd)

- **After the elections in December 2005 the Mozambican government allocated US\$200 000 to kick start the survey at the start of 2006.**
- **HSRC-led consortium still shared as much materials we had used as possible with the Mozambican researchers such as**
 - **both qualitative and quantitative research tools.**
 - **informed consent forms**
 - **protocol and SOPs**
- **Plans are still underway to undertake the survey later this year.**

Challenge 3: Lesotho

- MOU with MoH signed after fieldwork on usual DHS+ with ORC Macro International was completed among 15-49/55 year olds in October 2004 and specified that the HSRC would assist with follow-up analysis only on
 - making new projections based on the new data and
 - benchmarking of ANC-derived surveillance data.
- The DHS+ report was released in October 2005 (Actually in a way main objective of undertaking a pop-based survey was achieved without involving the HSRC)
- However, work by HSRC according to MOU could not commence following instruction from SADC to start closing down the project as from 9th September 2005.

Recommendations

- Although the project was not completed within the allocated time, the idea that population-based surveys are a gold standard for HIV surveillance is widely accepted.
- To date nine of the 14 SADC MS have undertaken or are committed to undertaking them in the near future
 - Botswana, Lesotho, Zambia, Swaziland and South Africa have done so
 - Malawi and Zimbabwe are currently doing so
 - Mozambique and Namibia (?) are planning to do so.
- Thus, four of the remaining five SADC MS (viz., Angola, DRC, Madagascar, and Tanzania) should also consider undertaking a population-based survey in the near future while ANC-based surveys and among high-risk (e.g., IDU) should be done in Mauritius.

Recommendations (contd)

- Due to high costs involved, it is recommended that each country undertakes at least one population-based survey to be used to benchmark ANC-derived surveillance data.
- It is important to note that some SADC MS like Botswana and South Africa have decided to use population-based surveys for HIV surveillance and evaluating impact of national programmes through doing time-series or repeated surveys.
 - For example, in South Africa the HSRC surveys have been tasked provide some of the data for populating indicators for both M & E of the new National Strategic Plan for HIV/AIDS and STIs 2007-2011 and for future UNGASS reports.
 - In the case of Botswana, they are planning for BAISSIII to replicate BAISSII while in South Africa the HSRC is planning for the third survey in the time series (2002, 2005, 2008, and at least two more surveys are planned for 2011 and 2014).

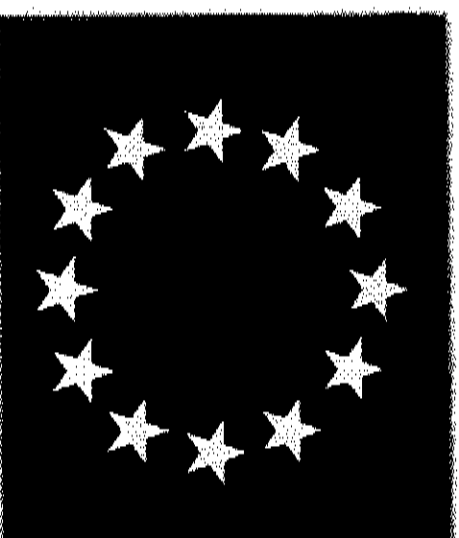
Recommendations (contd)

- Most interestingly, the HSRC included HIV incidence using BED EIA testing in its 2005 survey which will be repeated in 2008. Both Botswana and Zimbabwe are also planning to do the same next year.
 - This must be encouraged among all SADC MS as was emphasised by Hon Min of Health for Botswana Prof Sheila Tlou during her official opening address to the workshop.
- Furthermore, Botswana, South Africa and Swaziland have prevalence data from children between 1.5/2 years to 14 years and also among the elderly aged 50 years and older. Both South Africa and Zimbabwe will include under 2-year olds in the 2008 surveys and use PCR tests.
 - Such information is critical for understanding the full burden of the disease and must be included in determining national estimates and for comprehensive planning national responses, not only among 15-49 year olds as is possible from DHS+ approach only.
 - Other countries with especially those with national HIV prevalence rates higher than 10% in the adult population (i.e., nine of the SADC MS) must consider adopting the HSRC model.

Recommendations (contd)

- **A major lesson from this project is the need for respect for diversity of SADC MS in terms of each country's needs for undertaking population-based surveys such as:**
 - **available technical skills and experience including for laboratory testing**
 - **availability of resources to spare when there are other competing national priorities.**
 - **leadership within MS for rapid buy-in on the need of or taking ownership of population-based surveys.**
- **It is hoped that SADC and other regional partners such as UNAIDS-RST-ESA and our SAHARA network will facilitate provision of technical assistance among SADC MS to ensure that all countries undertake at least one population-based survey within the next 3 years preferably using preferably the HSRC model as was done in Botswana (and South Africa) or the hybrid HSRC-DHS+ model as was done in Swaziland.**

Acknowledgements

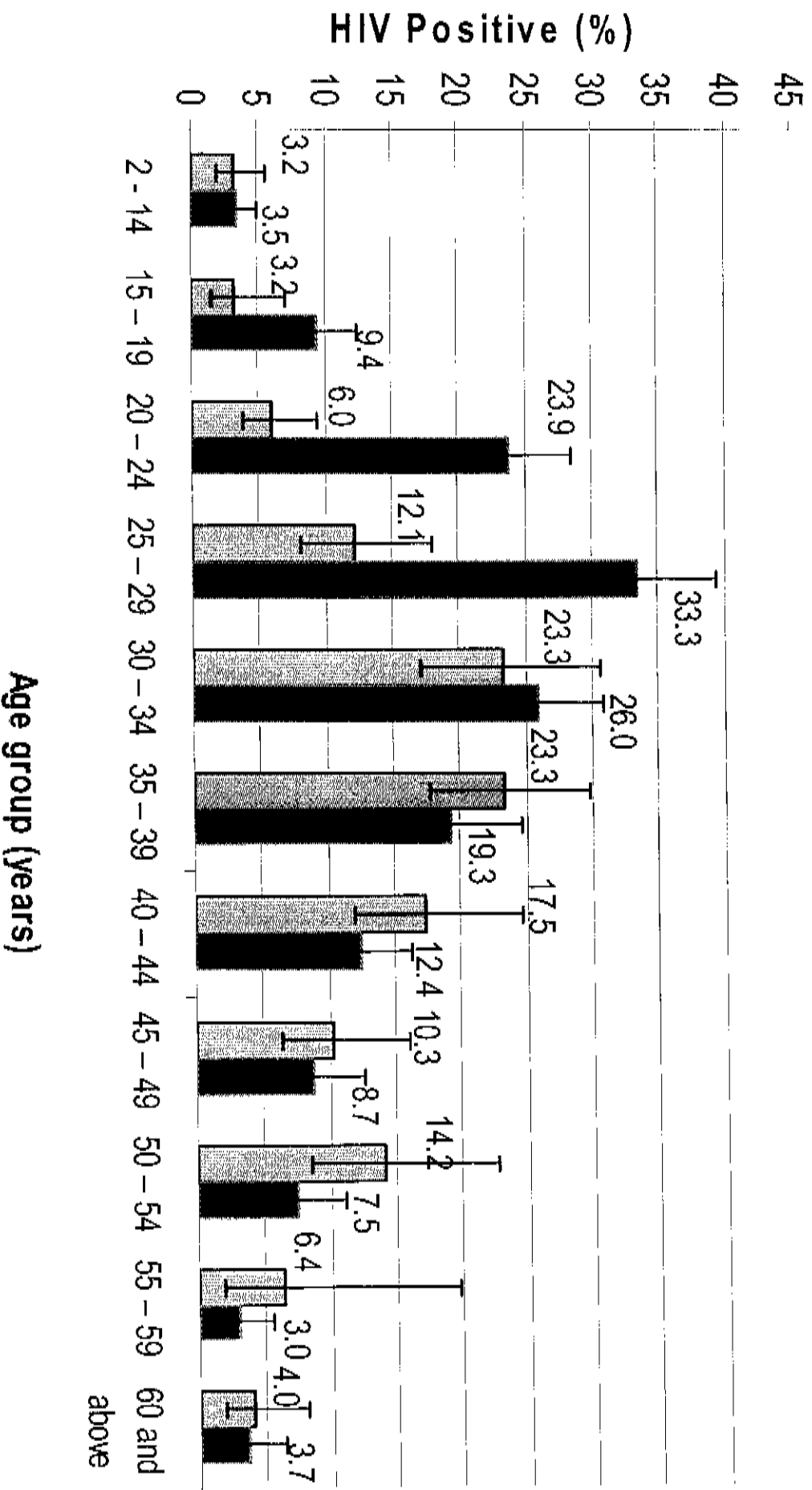




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HIV Prevalence, South Africa 2005

HIV prevalence by sex and age: 2005



Males
 Females

Females 15-49 years in 2005, compared to antenatal study 2004

Age group (Years)	African females 2005 (n=3,699)	African females pregnant in the last 24 months 2005 (n=630)	Antenatal survey 2004 (n=15,976)
	HIV+ % (n)	HIV+ % (n)	HIV+ % (n)
15 to 19	11.1 (766)	21.8 (58)	16.1 (3,130)
20 to 24	27.3 (819)	27.8 (215)	30.8 (4,991)
25 to 29	37.9 (435)	37.2 (126)	38.5 (3,702)
30 to 34	31.7 (454)	25.1 (98)	34.4 (2,510)
35 to 39	24.1 (458)	18.7 (84)	24.5 (1,261)
40 to 49	14.3 (767)	12.9 (49)	17.5 (382)
Total	24.4	26.8	29.5

HIV incidence, South Africa 2005

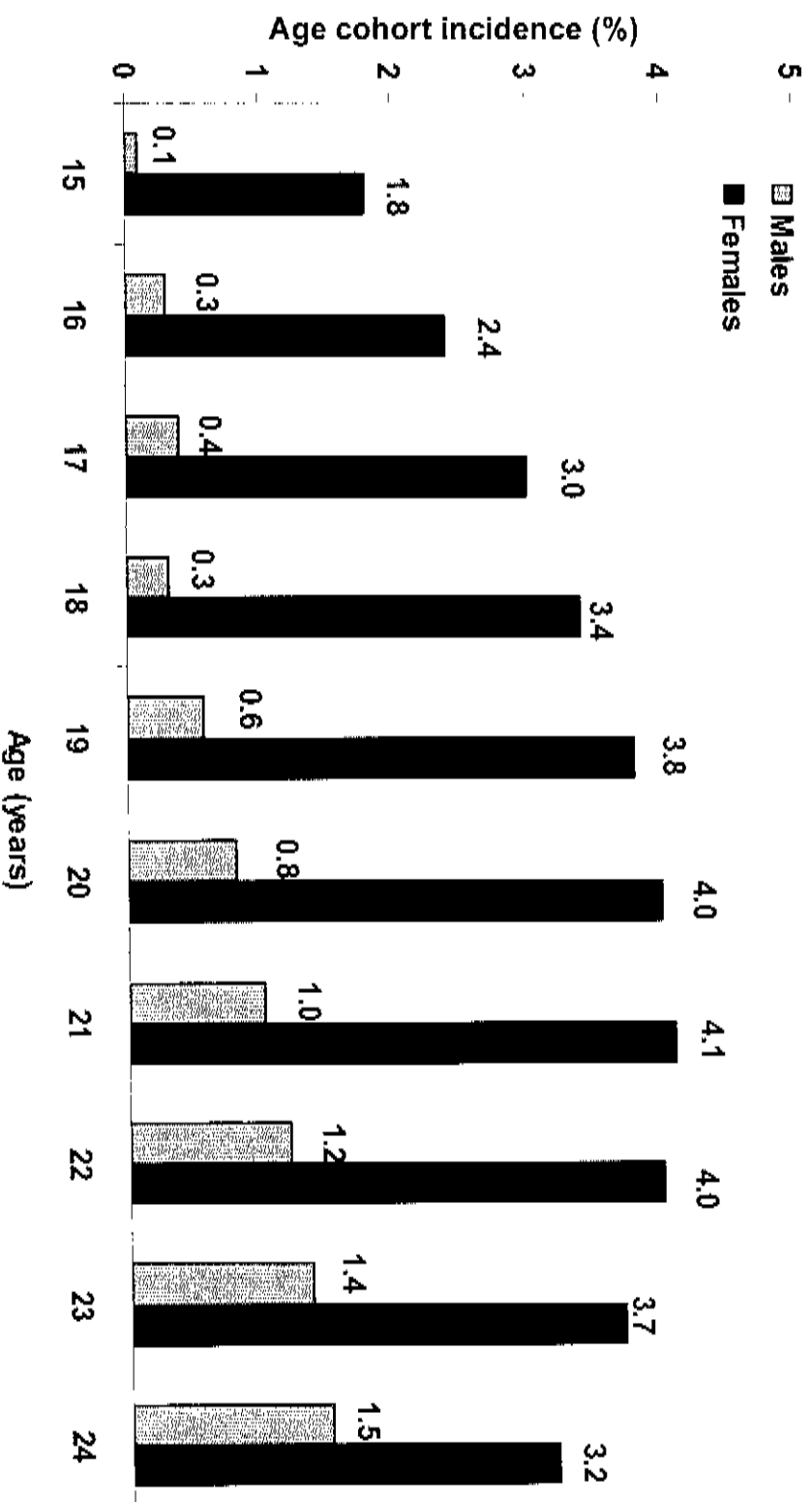
Estimation of HIV incidence

- **New tests allow for identification of recent infection using blood samples (including from blood spots)**
 - **BED capture EIA**
- **Developed by USA's Centers for Disease Control and Prevention (CDC)**
- **Technology is still new, still need validation**
- **Almost 16,000 specimens in survey allowed for identification of recent infection- ie. Past 180 days**
- **181 samples with recent infection identified**

Comparison of adjusted HIV incidence estimates, South Africa 2005

	BED ODn=0.8	BED ODn=0.4	BED Hargrove	BED McDougal	ASSA 2003
Overall (≥ 2 years)	2.7	1.3	1.5	1.4	1.3
<i>Male</i>	1.5	0.7	0.5	0.5	1.2
<i>Female</i>	3.9	1.9	2.5	2.4	1.5
Youth (15-24 years)	3.3	1.9	2.3	2.2	2.9
<i>Male</i>	0.8	0.3	0.3	0.3	1.8
<i>Female</i>	6.5	3.8	4.9	4.6	4.1
Adult (15-49 years)	4.4	1.9	2.6	2.4	2.2
<i>Male</i>	2.4	1.1	1.1	1.0	1.9
<i>Female</i>	6.3	2.8	4.0	3.8	2.5

HIV incidence estimates by sex from single year age cohort prevalence in 15-24 year olds



**HIV incidence and number of new infections by
age group, South Africa, 2005**
(Source: *Rehle et al., 2007*).

Age group (yrs)	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
>25	21 645 000	1.7 (1.1 - 2.3)	310 000
15-49	24 572 000	2.4 (2.2 - 2.7)	500 000

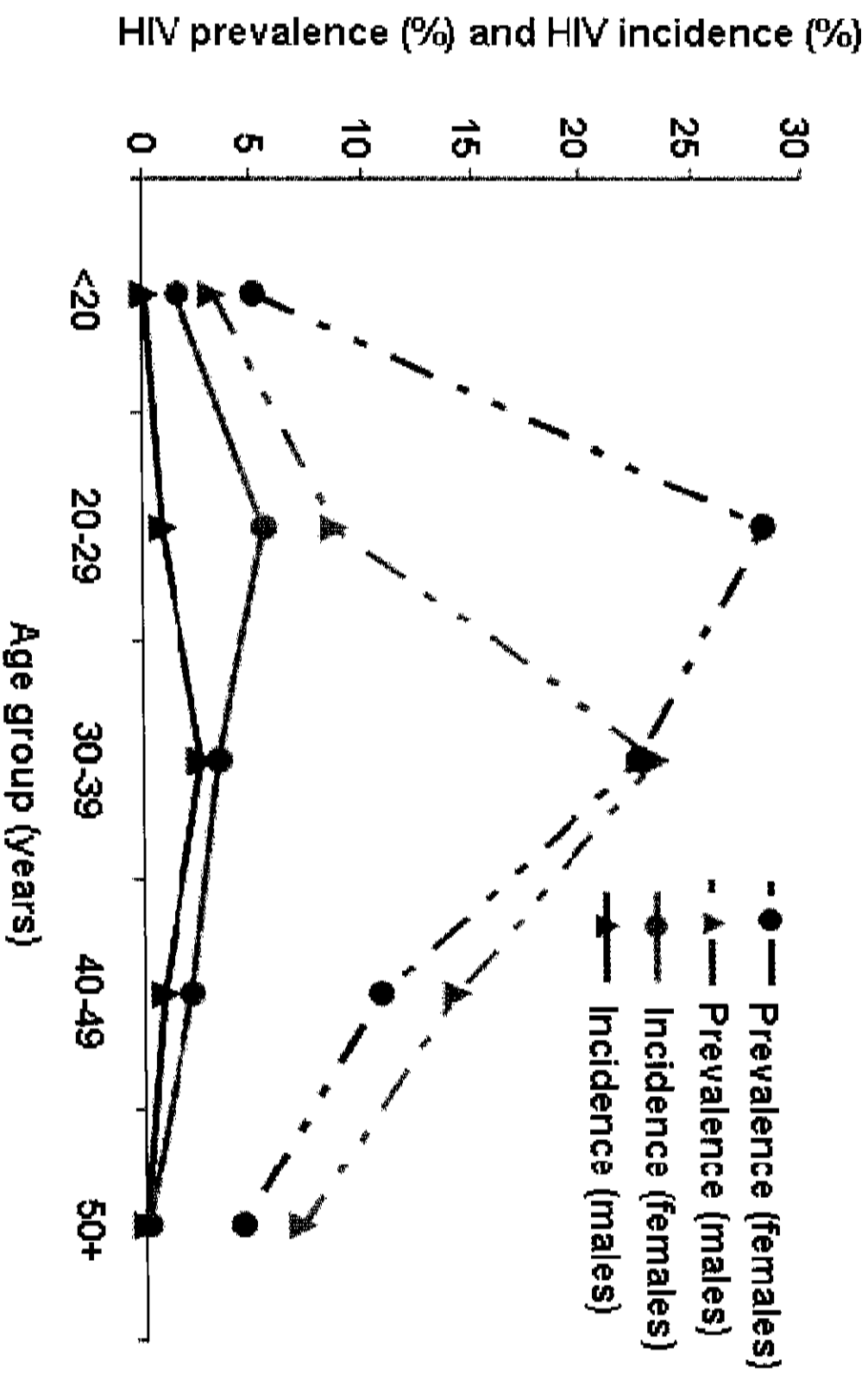
HIV incidence and number of new infections by race, province and locality type (age ≥ 2 years), South Africa, 2005 (Source: Rehle et al., 2007).

Variable	Weighted sample (N)	HIV incidence (% per year) (95% CI)	Estimated number of new infections per year (N)
Race			
Black	35 113 000	1.8 (1.3 - 2.3)	557 000
Other	9 337 000	0.2 (0.0 - 0.3)	14 000
Province			
Mpumalanga	3 083 000	2.4 (0.9 - 3.8)	63 000
Free State	2 827 000	1.9 (0.4 - 3.4)	47 000
Gauteng	8 512 000	1.9 (0.8 - 3.0)	144 000
KwaZulu-Natal	9 213 000	1.7 (0.7 - 2.7)	134 000
Limpopo	5 207 000	1.6 (0.3 - 2.8)	76 000
North West	3 642 000	1.0 (0.2 - 1.8)	33 000
Western Cape	4 382 000	0.8 (0.2 - 1.5)	33 000
Eastern Cape	6 777 000	0.7 (0.1 - 1.2)	40 000
Northern Cape	871 000	0.2 (0.0 - 0.4)	1 000
Locality type			
Urban informal	3 878 000	5.1 (3.2 - 7.0)	166 000
Rural formal	3 577 000	1.6 (0.7 - 2.5)	52 000
Rural informal	16 495 000	1.4 (0.1 - 2.8)	211 000
Urban formal	20 563 000	0.8 (0.3 - 1.2)	142 000

HIV incidence and HIV prevalence by age

and sex, South Africa, 2005

(Source: Rehle et al., 2007).



**Relationships between HIV
prevalence and HIV incidence and
self-reported socio-behavioural
factors, South Africa 2005**

HIV prevalence and incidence by self-reported socio-behavioural factors (age group 15 - 49 years)

(Source: Rehle et al., 2007).

Variable	Survey sample (N)	HIV prevalence (%) (95% CI)	HIV incidence (% per year) (95% CI)
Marital status			
Single	5 306	16.6 (14.9 - 18.5)	3.0 (1.9 - 4.1)
Married	3 240	14.3 (12.3 - 16.6)	1.3 (0.5 - 2.1)
Widowed	227	34.0 (25.5 - 43.7)	5.8 (0.0 - 13.8)
Divorced	318	15.1 (9.5 - 23.0)	0.5 (0.0 - 1.6)
Sexual history			
Never had sex	1 747	4.3 (2.7 - 7.0)	1.5 (0.0 - 3.0)
No sex in the past 12 months	1 358	18.0 (14.9 - 21.5)	2.4 (0.8 - 4.1)
Sexually active in the past 12 months	5 803	18.7 (17.0 - 20.6)	2.4 (1.5 - 3.3)
Current pregnancy	215	37.0 (24.9 - 51.0)	5.2 (0.0 - 12.9)
Number of sexual partners			
One sex partner in the past 12 months	5 233	18.4 (16.7 - 20.4)	2.1 (1.3 - 3.0)
More than one sex partner in the past 12 months	468	21.3 (15.9 - 28.0)	3.1 (0.0 - 6.4)
Condom use at last sex			
15 - 24 years			
Yes	1 011	14.3 [(11.0 - 18.4)	2.9 (0.5 - 5.2)
No	392	20.8 (15.3 - 27.8)	6.1 (0.0 - 12.9)
25 - 49 years			
Yes	1 049	24.9 (21.1 - 29.1)	2.2 (0.4 - 4.0)
No	1 068	16.0 (12.3 - 20.6)	1.9 (0.0 - 3.7)

References

A. The main research report:

Shisana, O., Rehle, T., Simbayi, L., Parker, W., Bhana, A., Zuma, K., Connolly, C., Jooste, S., Pillay, V. et al. (2005). *South African National HIV Prevalence, Incidence, Behaviour and Communication Survey 2005*. Cape Town: HSRC Press.

Available on www.hsrc.ac.za or www.hsrcpress.ac.za

B. Incidence paper:

Rehle, T., Shisana, O., Pillay, V., Zuma, K., Puren, A. & Parker, W. (2007). National HIV incidence measures – new insights into the South African epidemic. *South African Medical Journal*, 97(3), 194-199.