

REPORT

THE NATIONAL HIV AND SYPHILIS PREVALENCE SURVEY SOUTH AFRICA

2007

National Department of Health
South Africa 2008

ACRONYMS

AIDS	Acquired Immuno Deficiency Syndrome
ANC	Antenatal Care
BSS	Behavioural Surveillance Survey
CCMT	Comprehensive Care Management and Treatment
CI 95%	95% Confidence Interval
ELISA	Enzyme Linked Immuno Absorbent Assay
EPP	Estimation and Projection Package
HIV	Human Immunodeficiency Virus
IEC	Information, Education and Communication
NDOH	National Department of Health
NICD	National Institute for Communicable Diseases
NHLS	National Health Laboratory Service
PMTCT	Prevention of Mother-to-Child Transmission
PPS	Probability Proportional to Size
QA	Quality Assurance
RPR	Rapid Plasma Reagin (A screening test for syphilis)
STI	Sexually Transmitted Infection
TB	Tuberculosis
UNAIDS	United Nations Joint Program on HIV/AIDS
UNGASS	United Nations General Assembly Special Session on HIV/AIDS
VCT	Voluntary Counselling and Testing
WHO	World Health Organisation

FOREWORD

The 2007 report on the National HIV and Syphilis Antenatal Prevalence Survey show that South Africa may be making some real progress in its response to the HIV epidemic.

These are the first results to show a comparison of the impact of HIV infection between districts over two consecutive years. The epidemic is progressing at a different pace in the different provinces. The findings suggest that the South African HIV epidemic is on a downward trend.

Another important observation in the 2007 survey is that HIV prevalence amongst younger women (15 – 24 years) continues to show a significant decline. A decline in this age group is suggestive of a decline in HIV incidence and is a good indicator of the impact of intervention programmes. More concerted efforts in prevention strategies are needed in the older age groups where declines have not been observed.

The need for targeted strategies cannot be overemphasized in our comprehensive approach to reducing new HIV infections and reducing AIDS related morbidity. Differences in site and age group imply that different age groups at the different geographical areas need to have specific interventions depending on their situation if the overall low prevalence is to be sustained.

Finally, I would like to call on all South Africans to commit to the fight against HIV and AIDS, and practice Healthy Lifestyles. As this report shows, it is increasingly evident that given the will and determination - We can, ASIZITHANDE!

**DR M E TSHABALALA-MSIMANG, MP
MINISTER OF HEALTH**

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1. INTRODUCTION

Since the early 1990s HIV and AIDS have continued to present a challenge to public health in South Africa. Sub-Saharan Africa in general remains one of the most affected regions in the world. In 2007, an estimated 1.7 million people in the sub region were newly infected with HIV, the majority (61%) being women (UNAIDS Update).

Control of HIV in South Africa involves multi-sectoral approaches involving government, research and academic institutions, civil society, non-governmental organisations, community based organisations and the private sector working together against the health and social consequence of HIV and AIDS.

Estimates of HIV prevalence in South Africa are mainly based on surveillance among pregnant women attending sentinel antenatal clinics (ANC). Collection of such data has been conducted on an annual basis since 1990. These annual antenatal HIV and syphilis surveys are currently the primary source for monitoring of HIV trends and provide the basis for HIV estimation in the general population of South Africa.

The 2007 survey was conducted to estimate the prevalence of HIV infection in the South African population. The survey was conducted in all nine provinces using the standard unlinked anonymous methodology (WHO/UNAIDS).

In order to obtain a better understanding of the dynamics of the epidemic in the country, the antenatal survey is only one tool used to track HIV spread. A range of other community based and incidence studies are employed to augment this surveys information.

2. OBJECTIVES

General objective: The general objective of the 2007 National HIV and Syphilis prevalence survey was to continue to monitor the epidemic and provide HIV prevalence data for planning, monitoring and evaluation of HIV and AIDS response activities.

Specific objectives:

1. To determine the national HIV and Syphilis prevalence.
2. To determine the HIV geographic distribution among pregnant women attending antenatal clinics.
3. To monitor the trends in HIV and syphilis prevalence.
4. Estimate and project HIV prevalence in the general population.

3. METHODOLOGY

The 2007 antenatal survey was conducted, in all nine provinces using the standard unlinked anonymous methodology (WHO & UNAIDS), to estimate the prevalence of HIV infection in the South African population. To enhance the sensitivity of the estimates and to provide greater robustness, the HIV sample size was expanded in 2006 to provide prevalence estimates for each district in the country in addition to the national and provincial rates. A total of 36 000 pregnant women were targeted. The women were recruited from 1 415 sentinel sites compared to the previous cohort of 861 sentinel sites in 1990 to 2005.

3.1 PREPARATORY PHASE

The protocol and methodology were reviewed with all provincial survey coordinators. In addition, pre-2007 survey workshops were held at the National Department of Health as well as in all nine Provincial Health offices before the scheduled commencement date of the survey. Participants in these workshops included provincial and laboratory coordinators, health information officers, data capturers, communicable disease coordinators and facility nurses. The training covered criteria for selection of the sites, recruitment of pregnant women, data administration, blood sample collection, labelling, coding, serum separation, storage, sample transportation, syphilis and HIV testing, confidentiality and ethical issues, supervision and quality assurance procedures.

3.2 SAMPLING

3.2.1 Sentinel population

This study was conducted as an unlinked anonymous survey amongst pregnant women who attended public health antenatal clinic services for the first time during the current pregnancy. The demographic details of the participants, with the exception of any particulars from which it may be possible to ascertain the identity of the patient, were collected using a standardized collection form. A unique bar code was allocated to each of the participants and it is this number that was recorded on the form and also used for labelling the blood samples. The bar code was used to link the demographic information with the lab results while maintaining anonymity of the survey participant.

3.2.2 Sentinel sites

The selection of sentinel sites was based on the Probability Proportional to Size (PPS) sampling method. A stratified proportional sample was drawn and the sample size was proportionally allocated to each facility using antenatal clinic attendance data. This produced a self-weighting sample for each district. This proportionate sample size was compared to the data on first time antenatal clinic attendees as obtained from the District Health Information System (DHIS). This allowed for establishing the plausibility of the number of proposed samples to be collected.

The inclusion of sentinel sites was based on the following criteria:

- The clinic must be routinely drawing blood from attendees on the first visit of the current pregnancy.
- Clinics must have the facilities to store the samples at 4°C.
- The clinic should provide service to sufficient first time antenatal clinic attendees to ensure that a minimum of 20 subjects can be recruited over a period of a month.
- There must be transport arrangements in place that will allow for samples to be taken to a laboratory within 24 hours if there is no centrifuge in the facility or within 72 hours if the samples can be centrifuged on site.

3.2.3 Sample size and sampling period

In 2006, the National Department of Health doubled the sample size to 36 000. This allowed for district level estimates of HIV prevalence in addition to the national and provincial rates. Sample collection from all the sites started on 1st October 2007 and ended on 31st October 2007.

3.3 DATA AND SAMPLE COLLECTION

Participation in the study was voluntary, with informed consent for answering the questions on the forms and for collecting the blood samples. For reasons of confidentiality, testing was done on anonymous unlinked samples, in large batches. Syphilis screening is routinely done in the ANC clinics. Hence, syphilis screening was used as an entry point for HIV testing using anonymous unlinked procedures. Two blood samples were taken by venous puncture. One sample was labelled in accordance with the routine syphilis test to enable results to be sent back to the facility and for the woman to be informed of her result. The second sample was labelled with a bar code number of the individual pregnant

woman and stored at 4°C. The corresponding data collection form with the woman's demographic details was labelled with the same bar code number. At the close of each day the supervisors checked the forms against the blood samples for any mistakes and for completeness. The samples, together with the forms, were transported in a cooler box to the participating provincial laboratory where HIV and syphilis testing was done.

3.4 LABORATORY PROCEDURES

3.4.1 Laboratory testing

In accordance with the recommendations of the WHO on HIV screening for surveillance purposes, blood samples were tested with one ELISA (Abbot Axysm System for HIV-1 HIV-2) assay. The samples were also screened for active syphilis using the RPR test. Participating laboratories included the NHLS laboratories in Bloemfontein, Johannesburg, Kimberley, Middleburg, Port Elizabeth and Stellenbosch, MEDUNSA, and the Virology laboratory of the University of KwaZulu-Natal.

3.4.2 Quality control

Several measures were put in place to ensure that the results were valid and reliable. Internal quality control for ELISA and RPR tests was the responsibility of each individual participating laboratory. The National Institute for Communicable Diseases (NICD) and the Medical University of Southern Africa (MEDUNSA) served as external quality control institutions for HIV and syphilis respectively.

3.5 STATISTICAL ANALYSIS

Analysis of trends in HIV sero-prevalence was done separately for each province and each health district owing to the variability between provinces and within districts and was stratified according to age groups using the STATA software package. The analysis was mainly focused on determining the prevalence rate of HIV and syphilis. The overall prevalence rates were also determined.

3.6 MONITORING OF THE SURVEY

Monitoring was conducted by teams from National, Provincial and District Health levels and involved regular visits to ANC sites, laboratories, District Health and Provincial Health offices.

3.7 LIMITATIONS OF THE STUDY

As with most studies, this study has several limitations. These limitations relate to sampling - the study is conducted in public health facilities that are not necessarily representative of the demographic and socio-economic profile of the country. In terms of generalisation and extrapolation to the population as a whole, pregnant women are considered a high-risk group and their HIV status therefore provides an over-estimate of HIV prevalence. This has however been adjusted by using the Spectrum Model. In this study, 196 out of 33 684 samples were excluded from the analysis because of missing data.

4. RESULTS

4.1 DISTRIBUTION AND CHARACTERISTICS OF STUDY PARTICIPANTS

Ninety four per cent of the actual target (33 684 / 36 000) participated in the survey. The analysis was done on 33 488 samples where 196 were excluded from the analysis because of missing data. 1401 sentinel sites selected participated in the survey.

Distribution by province

The distribution of participants in the antenatal surveys from 2005 to 2007 is shown in Table 1a.

Table 1a: Sample population distribution by province 2005, 2006 and 2007.

Province	2005		2006		2007	
	N	%	N	%	N	%
Eastern Cape	2 189	13.3	4 074	12.3	4 118	12.2
Free State	935	5.7	2 225	6.7	2 169	6.4
Gauteng	3 110	18.8	6 145	18.6	7 023	20.9
KwaZulu-Natal	3 500	21.2	6 814	20.6	6 920	20.5
Limpopo	1 897	11.5	3 869	11.7	3 748	11.1
Mpumalanga	1 027	6.2	2 212	6.7	2 332	7.0
Northern Cape	567	3.4	1 087	3.3	1 191	3.5
North West	1 325	8.0	2 742	8.3	2 353	7.0
Western Cape	1 960	11.9	3 866	11.7	3 830	11.4
Total	16 510	100	33 034	100	33 684	100

Distribution by age group

Table 1b shows the distribution of antenatal survey participants by age group for the years 2005 to 2007. Age was missing for 182 (0.5%) of the participants. The proportion of participants by age group in the antenatal survey has remained consistent. This may suggest that patterns of pregnancy by age group remained fairly consistent over the past three years. The largest proportion (31%) of participants was women between the ages of

20 and 24 years. Teenagers in the age group 15–19 years constituted approximately 19% of all participants in the survey. The effect of ageing out of the fertility period as one grows older and the effect of mortality is probably reflected in the age distribution of the respondents in the older age groups (45-49 years) as shown in the table below.

Table 1b: Sample population distribution by age group 2005, 2006 and 2007.

Age group (Years)	2005		2006		2007	
	N	%	N	%	N	%
15 - 19	3 334	20.2	6 299	19.1	6 377	19.0
20 – 24	5 068	30.7	10 478	31.7	10 616	31.5
25 – 29	3 906	23.7	7 661	23.2	7 912	23.5
30 – 34	2 534	15.3	5 018	15.2	5 091	15.1
35 – 39	1 246	7.5	2 531	7.7	2 722	8.1
40 – 44	356	2.2	735	2.2	702	2.1
45 – 49	52	0.3	95	0.3	82	0.2
Missing	14	0.08	217	0.7	182	0.5
Total	16 510	100.0	33 034	100.0	33 684	100

4.2 HIV PREVALENCE ESTIMATES

4.2.1 National HIV prevalence estimates

The national HIV prevalence rates have been stable for several years. There is now evidence of the epidemic being on the decline. The 2007 national HIV prevalence estimate stands at 28.0% (CI: 26.9% – 29.1%). This represents a possible 1.1% reduction in HIV prevalence from 2006 to 2007. When the 2005 and 2007 HIV estimates are compared, we observe a statistically significant decline in HIV prevalence (Figure 1).

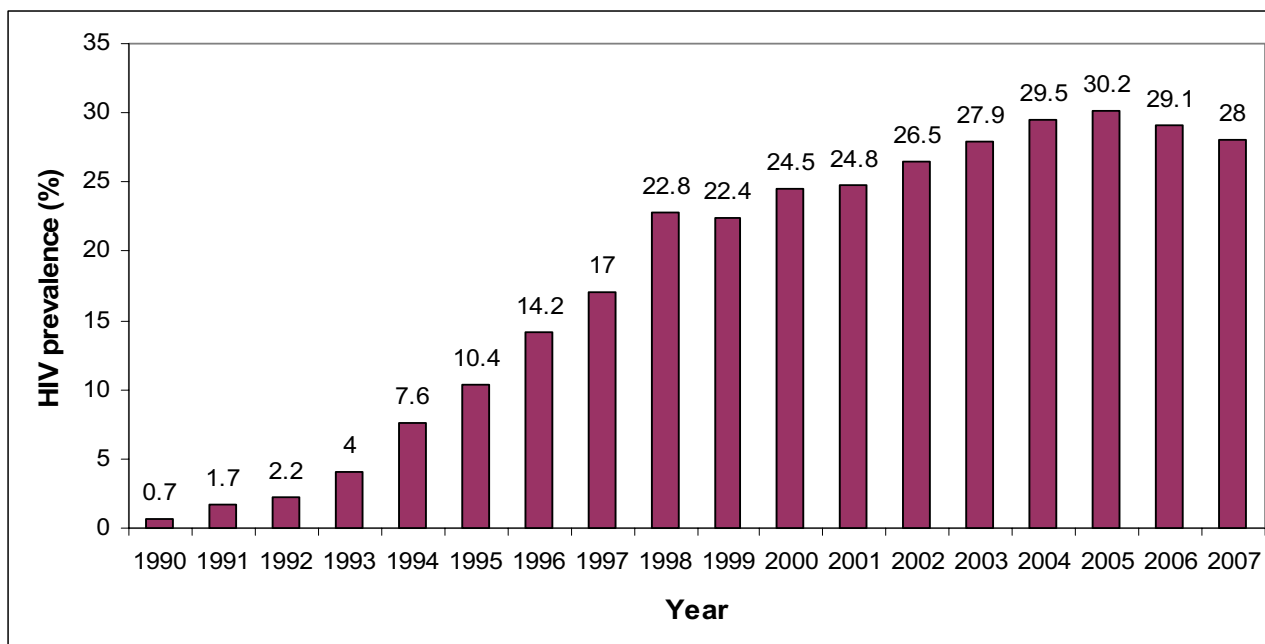


Figure 1: National HIV prevalence trends among antenatal clinic attendees, South Africa, 1990 to 2007.

The national HIV prevalence distribution is shown in Figure 2. The variation in the intensity of infection shows that there are different HIV epidemics occurring at the same time in the country, this is also characterized by the different sexual risk behaviour of different sub-populations in the different communities served by these clinics.

4.2.2 Provincial HIV prevalence estimates

When 2006 and 2007 estimates are compared, the findings show that Provincial estimates generally showed reduction e.g. KwaZulu-Natal, Limpopo, Western Cape and Eastern Cape. Other provinces remained relatively stable. However, two provinces, Free State and Northern Cape show signs of increase but this is not an actual statistically significant increase. The distribution of HIV by province is shown in figure 4.

Figure 2: HIV prevalence estimates by district among antenatal clinic attendees, South Africa, 2007

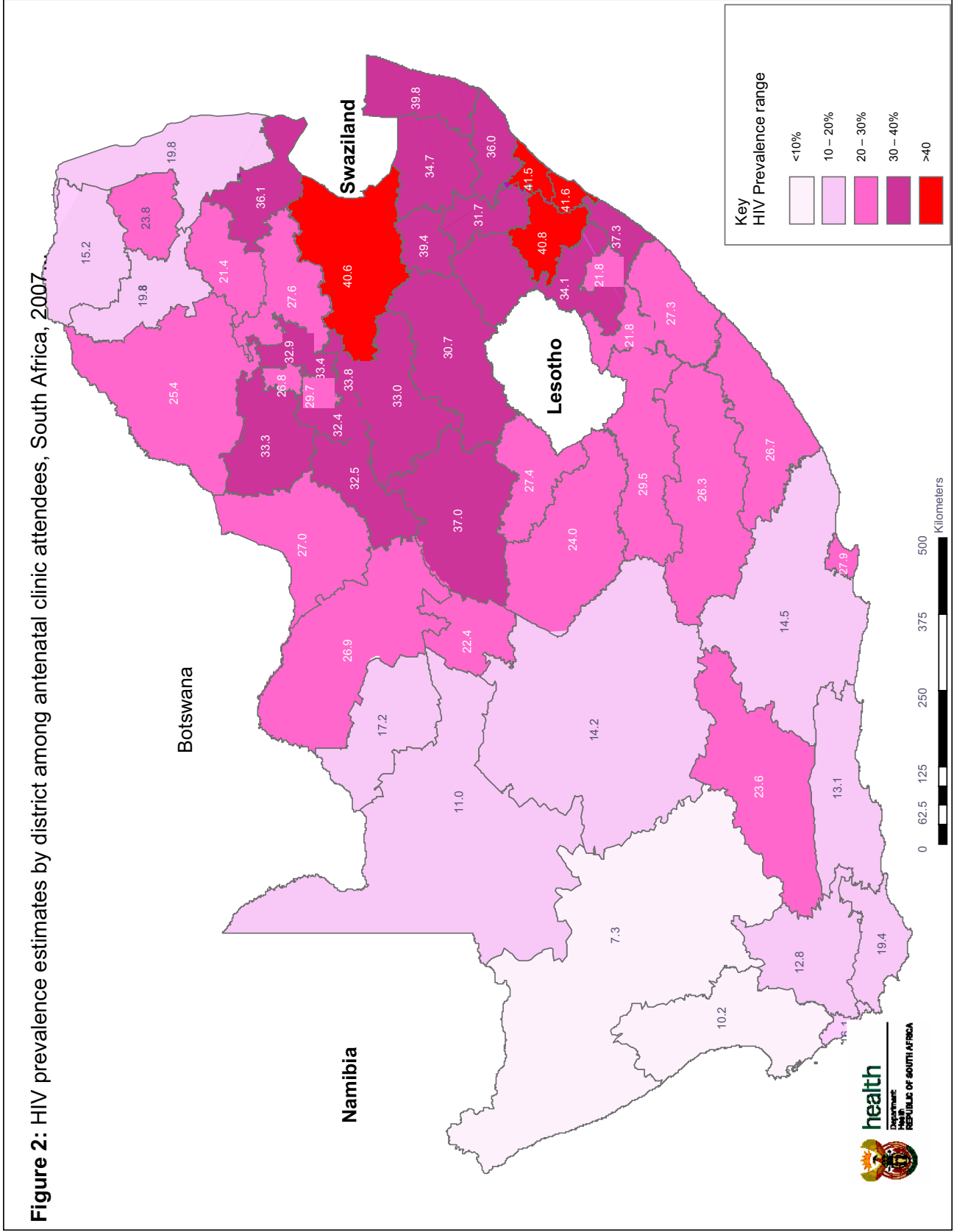


Table 2: Provincial HIV prevalence estimates among antenatal clinic attendees, South Africa, 2005 – 2007.

Province	HIV pos. 95% CI		HIV pos. 95% CI	
	2005	2006	2006	2007
KwaZulu-Natal	39.1 (36.8 - 41.4)	39.1 (37.5 - 40.7)	39.1 (37.5 - 40.7)	37.4 (35.0 - 39.8)
Mpumalanga	34.8 (31.0 - 38.5)	32.1 (29.8 - 34.4)	32.1 (29.8 - 34.4)	32.0 (29.2 – 34.9)
Free State	30.3 (26.9 - 33.6)	31.1 (29.2 - 33.1)	31.1 (29.2 - 33.1)	33.5 (28.3 - 39.1)
Gauteng	32.4 (30.6 - 34.3)	30.8 (29.6 - 32.1)	30.8 (29.6 - 32.1)	30.3 (29.9 – 32.8)
North West	31.8 (28.4 - 35.2)	29.0 (26.9 - 31.1)	29.0 (26.9 - 31.1)	29.0 (24.8 – 33.5)
Eastern Cape	29.5 (26.4 - 32.5)	28.6 (26.8 - 30.4)	28.6 (26.8 - 30.4)	26.0 (24.0 - 28.1)
Limpopo	21.5 (18.5 - 24.6)	20.6 (18.9 - 22.3)	20.6 (18.9 - 22.3)	18.5 (16.7- 20.4)
Northern Cape	18.5 (14.6 - 22.4)	15.6 (12.7 - 18.5)	15.6 (12.7 - 18.5)	16.1 (13.9 – 18.7)
Western Cape	15.7 (11.3 - 20.1)	15.1 (11.6 - 18.7)	15.1 (11.6 - 18.7)	12.6 (10.1 – 15.6)
National	30.2 (29.1 - 31.2)	29.1 (28.3 - 29.9)	29.1 (28.3 - 29.9)	28.0 (26.9 – 29.1)

N.B. The 95% CI was used because statistically the true estimated value falls within the two confidence limits and therefore assures us that there is 95% certainty that the estimated value is not by chance.

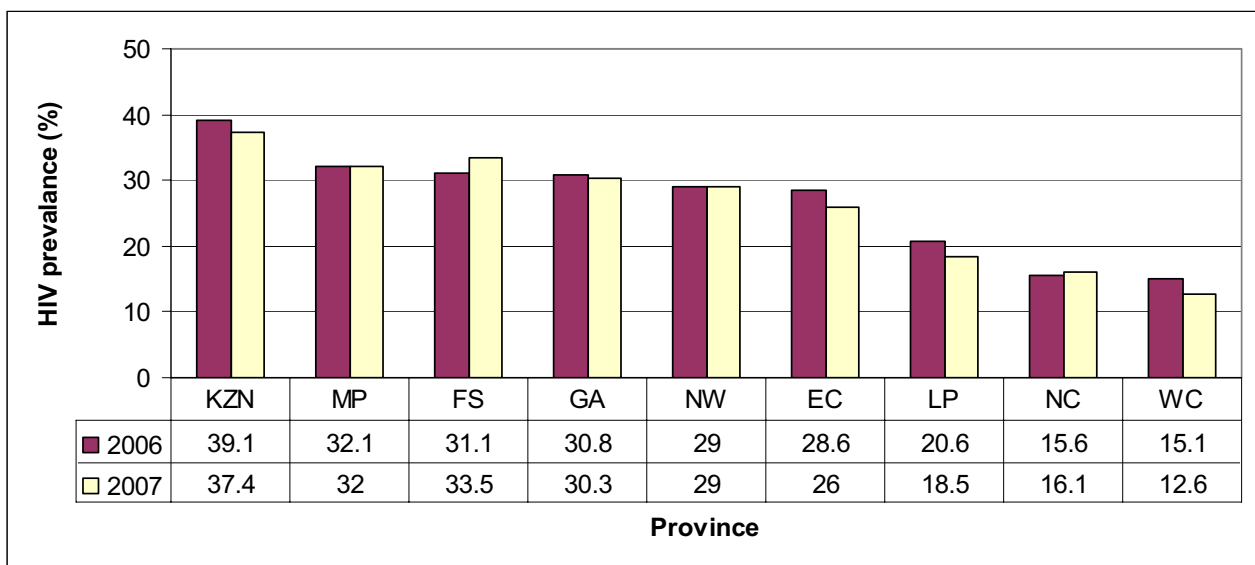
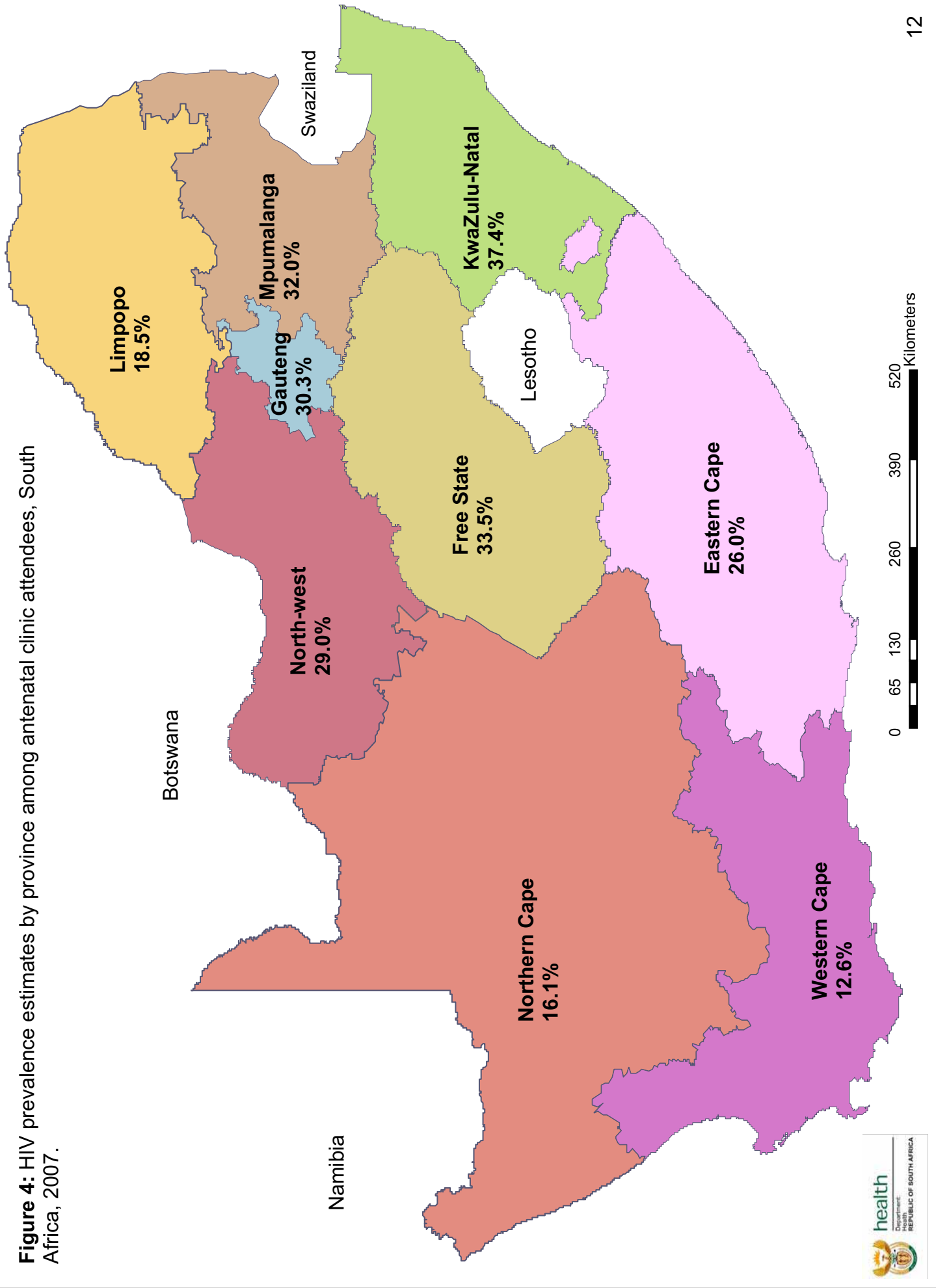


Figure 3: Provincial HIV prevalence estimates among antenatal clinic attendees, South Africa, 2006 – 2007.

Provincial HIV prevalence trends over the five years are shown in Figure 5. The epidemic has progressed at different pace in different provinces with Western Cape, Northern Cape and Limpopo consistently at lower levels compared to other provinces. KwaZulu-Natal has consistently reported the highest HIV prevalence in the country.

Figure 4: HIV prevalence estimates by province among antenatal clinic attendees, South Africa, 2007.



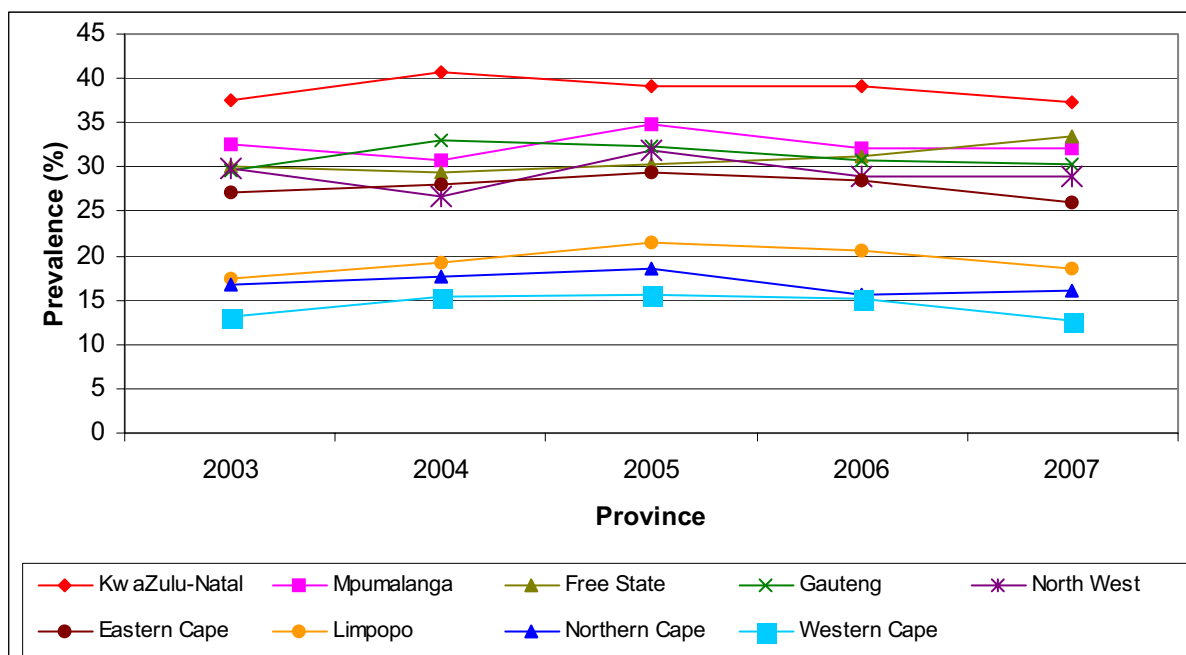


Figure 5: Provincial HIV prevalence trends among antenatal clinic attendees, South Africa, 2003 – 2007.

4.2.3 District HIV prevalence estimates

The 2007 survey is unique from previous surveys in that it has retained the 2006 sample size in order to obtain HIV prevalence estimates for each district of South Africa.

Generally, there is a statistically significant variation in HIV prevalence between some of the provinces and within districts. What is markedly evident is a decrease in HIV prevalence in those districts that had very high prevalence rates i.e. > 40% in 2006: Amajuba (KZN), Zululand (KZN) and Umgungundlovu (KZN) have shown a decrease of between 2% to 5% in 2007. In districts serving metropolitan areas, urban informal settlements and mining communities, the HIV prevalence has either remained constant or has decreased slightly e.g. eThekweni (KZN), Cape Metropol, Cape Winelands (WC) and Motheo (FS). However, in districts serving predominantly rural areas, the HIV prevalence has increased slightly. This is pronounced in Xhariep (FS), O.R. Tambo (EC), Umziyathi (KZN) and Sekhukhune (LP). In all districts of Mpumalanga, Pixley district (NC), Bophirima & Central (NW), Central Karoo, Eden, Overberg & West Coast (WC) the prevalence rates from 2006 to 2007 have increased significantly (see Tables 3 - 11).

Intra-provincial variations were wide for Northern Cape (7.3% to 22.4%); Western Cape (10.2% to 23.6%); Mpumalanga (27.6% to 40.6%) and Eastern Cape (14.5% to 29.5%) Maps showing the HIV prevalence by district for each province are shown in Annexure 1.

Eastern Cape Province

In the Eastern Cape, there was a decrease in HIV prevalence especially among women served in metropolitan or urban areas like Nelson Mandela Metro, Alfred Nzo and Cacadu. A slight increase was however noted in the clinics serving rural nodes like Amatole, Chris Hani and Ukhahlamba.

Table 3: HIV prevalence estimates by district among antenatal clinic attendees, Eastern Cape, 2006 and 2007.

Eastern Cape Province	2006			2007		
	N	Prev. (%)	CI (95%)	N	Prev. (%)	CI (95%)
	4074	28.6	26.8 - 30.4	4118	26.0	24.0 - 28.1
Alfred Ndzo	374	25.1	20.7 - 29.5	189	21.8	17.8 – 26.5
Amatole	1 061	28.7	26.0 - 31.5	1 058	26.7	22.5 – 31.3
Cacadu	254	22.8	17.7 - 28.0	269	14.5	9.23 – 22.34
Chris Hani	450	27.1	23.0 - 31.2	572	26.3	21.9 – 31.3
Nelson Mandela Metro	748	31.9	28.6 - 35.3	770	27.9	22.4 – 34.2
O R Tambo	983	29.7	26.8 - 32.6	1 036	27.3	27.5 – 33.2
Ukhahlamba	204	27.9	21.8 - 34.1	224	29.5	23.6- 35.9

N.B. The 95% CI was used because statistically the true estimated value falls within the two confidence limits and therefore assures us that there is 95% certainty that the estimated value is not by chance.

Free State Province

In the Free State, statistical evidence shows that the prevalence in Xhariep, Fezile Dabi and Lejweleputswa district has increased. However, there was a decrease in HIV prevalence among women attending clinics in the metropolitan area of Motheo district (Table 4).

Table 4: HIV prevalence estimates by district among antenatal clinic attendees, Free State, 2006 and 2007.

Free State Province	2006			2007		
	N	Prev (%)	CI (95%)	N	Prev (%)	CI (95%)
	2225	31.1	29.2 – 33.1	2169	33.5	28.3 - 39.1
Fezile Dabi	383	29.5	24.9 – 34.1	361	33.0	28.2-38.1
Lejweleputswa	583	34.1	30.3 – 38.0	578	37.0	33.1- 41.1
Motheo	580	30.5	26.8 – 34.3	565	27.4	23.8 – 31.3
Thabo Mofutsanyane	562	32.2	28.3 – 36.1	544	30.7	26.9- 34.8
Xhariep	117	19.7	12.4 – 26.9	121	24.0	16.7 – 32.6

N.B. The 95% CI was used because statistically the true estimated value falls within the two confidence limits and therefore assures us that there is 95% certainty that the estimated value is not by chance.

Gauteng Province

There is strong evidence that the overall HIV prevalence in Gauteng province has remained constant, with all districts showing a decreasing or static HIV prevalence in 2006 and 2007 except Ekurhuleni, which showed a slight increase (Table 5).

Table 5: HIV prevalence estimates by district among antenatal clinic attendees, Gauteng, 2006 and 2007.

Gauteng	2006			2007		
	N	Prev (%)	CI (95%)	N	Prev (%)	CI (95%)
	6145	30.8	29.6 - 32.1	7023	30.3	29.1 - 32.8
City of Johannesburg	2 399	30.6	28.8 - 32.5	2 580	29.7	27.9 – 31.5
Ekurhuleni	1 765	32.3	30.1 - 34.5	1 795	33.4	31.2 – 35.6
Metsweding	***	***	***	70	32.9	22.1- 45.1
Sedibeng	386	35.0	30.2 - 39.7	577	33.8	30.0 – 37.8
Tshwane	1 190	26.5	24.0 - 29.0	1 498	26.8	24.6 – 29.1
West Rand	405	34.6	30.0 - 39.2	503	32.4	28.4 – 36.7

***. Metsweding Health District was the only district not sampled in 2006 due to demarcation processes in North-west province. It was transferred to Gauteng province in 2007.

N.B. The 95% CI was used because statistically the true estimated value falls within the two confidence limits and therefore assures us that there is 95% certainty that the estimated value is not by chance.

KwaZulu-Natal Province

A similar HIV prevalence trend in districts is shown in KwaZulu-Natal, where, like other provinces, the clinics serving urban communities showed a constant prevalence rate from

2006 to 2007. The districts that had a prevalence of more than 40% in 2006 have remained constant (Ethekewini), or have shown a decrease in 2007 (Amajuba and Umgungundlovu). Rural districts showed a slight increase in HIV infection rates (Table 6).

Table 6: HIV prevalence estimates by districts among antenatal clinic attendees, KwaZulu-Natal, 2006 and 2007.

KwaZulu-Natal Province	2006			2007		
	N	Prev (%)	CI (95%)	N	Prev (%)	CI (95%)
KwaZulu-Natal	6,814	39.1	37.5 – 40.7	6918	37.4	35.0 - 39.8
Amajuba	400	46.0	41.1 – 50.9	404	39.4	34.6 – 44.3
Sisonke	229	31.9	25.8 – 37.9	328	34.1	29.1 – 39.6
Ugu	504	38.9	34.6 – 43.1	512	37.3	33.1 – 41.7
Umkhanyakude	410	36.3	31.7 – 41.0	407	39.8	35.0 - 44.8
Umzinyathi	319	27.9	23.0 – 32.8	338	31.7	26.8 – 37.0
Uthukela	459	35.1	30.7 – 39.4	452	36.3	31.0 – 40.9
Uthungulu	566	34.6	30.7 – 38.5	567	36.0	32.0 – 40.1
Zululand	582	36.9	33.0 – 40.9	580	34.7	30.8 – 38 7
Ethekewini	2,230	41.6	39.5 – 43.6	2 217	41.6	39.6 – 43.7
iLembe	419	39.1	34.5 – 43.8	417	41.5	36.7 – 46.4
UMgungundlovu	696	44.4	40.7 – 48.1	696	40.8	37.1 – 44.6

N.B. The 95% CI was used because statistically the true estimated value falls within the two confidence limits and therefore assures us that there is 95% certainty that the estimated value is not by chance.

Limpopo Province

Some rural districts in Limpopo showed an increase in HIV prevalence from 2006 to 2007, however in areas around the major cities and mining communities, the prevalence appears to be stabilizing (Table 7).

Table 7: HIV prevalence estimates by districts among antenatal clinic attendees, Limpopo, 2006 and 2007.

Limpopo Province	2006			2007		
	N	Prev. (%)	CI (95%)	N	Prev. (%)	CI (95%)
Limpopo	3,869	20.6	18.9 - 22.3	3748	18.5	16.7- 20.4
Capricorn	885	24.2	21.3 - 27.0	919	19.8	17.3 – 22.6
Mopani	723	24.7	21.6 - 27.9	655	23.8	20.6 – 27.3
Sekhukhune	772	16.1	13.5 - 18.6	772	21.4	18.6 – 24.5
Vhembe	954	14.1	11.9 - 16.4	922	15.2	13.0 – 17.7
Waterberg	535	27.5	23.7 - 31.3	480	25.4	21.6 – 29.6

N.B. The 95% CI was used because statistically the true estimated value falls within the two confidence limits and therefore assures us that there is 95% certainty that the estimated value is not by chance.

Mpumalanga Province

Of concern is that all districts in Mpumalanga especially Ehlanzeni, showed an increase in HIV prevalence from 2006 to 2007. Gert Sibande had a prevalence rate above 40% (Table 8).

Table 8: HIV prevalence estimates by districts among antenatal clinic attendees, Mpumalanga, 2006 and 2007

Province	2006			2007		
	N	Prev. (%)	CI (95%)	N	Prev. (%)	CI (95%)
	2 212	32.1	29.8 – 34.4	2332	32.0	29.2 – 34.9
Ehlanzeni	1 040	31.9	29.1 – 34.8	1 061	36.1	33.2 – 39.1
Gert Sibande	530	38.9	34.7 – 43.0	564	40.6	36.5 – 44.8
Nkangala	642	26.8	23.4 – 30.2	707	27.6	24.3 – 31.1

N.B. The 95% CI was used because statistically the true estimated value falls within the two confidence limits and therefore assures us that there is 95% certainty that the estimated value is not by chance.

Northern Cape Province

When looking at the Northern Cape, the HIV prevalence rate in clinics around urban areas is fairly constant, whereas in rural districts it has increased slightly. Pixley District showed a significant increase in prevalence of 4,2% from 2006 to 2007 (Table 9).

Table 9: HIV prevalence estimates by districts among antenatal clinic attendees, Northern Cape, 2006 and 2007.

Northern Cape Province	2006			2007		
	N	Prev (%)	CI (95%)	N	Prev (%)	CI (95%)
	1,087	15.6	12.7 – 18.5	1190	16.1	13.9 – 18.7
F Baard	422	22.7	18.7 – 26.7	442	22.4	18.7 – 26.6
Kgalagadi	49	18.4	7.5 - 29.2	180	17.2	12.0 – 23.5
Namakwa	95	5.3	0.8 - 9.7	82	7.3	2.7 – 15.2
Pixley	253	10.7	6.9 - 14.5	232	14.2	10.0 – 19.4
Siyanda	268	12.3	8.4 - 16.2	254	11.0	7.5 – 15.5

N.B. The 95% CI was used because statistically the true estimated value falls within the two confidence limits and therefore assures us that there is 95% certainty that the estimated value is not by chance.

North West Province

In the North-West province there is an overall increase in HIV prevalence especially in Bophirima (increase of 5.1%), while the areas around the platinum mines show a degree of stabilization (Table 10).

Table 10: HIV prevalence estimates by districts among antenatal clinic attendees, North West, 2006 and 2007.

North-West Province	2006			2007		
	N	Prev. (%)	CI (95%)	N	Prev. (%)	CI (95%)
	2,742	29.0	26.9 – 31.1	2349	29.0	24.8 – 33.5
Bojanala	1 191	33.6	30.9 – 36.3	903	33.3	30.3 – 36.5
Bophirima	495	21.8	18.2 – 25.5	357	26.9	22.4 – 31.9
Central	564	23.6	20.1 – 27.1	544	27.0	23.4 – 31.0
Southern	492	31.5	27.4 – 35.6	545	32.5	28.6 – 36.6

N.B. The 95% CI was used because statistically the true estimated value falls within the two confidence limits and therefore assures us that there is 95% certainty that the estimated value is not by chance.

Western Cape Province

In the Western Cape the HIV prevalence in Central Karoo has more than doubled from 8.3% in 2006 to 23.6% in 2007. This is a significant increase. The prevalence in the Cape Town Metro has remained constant. The HIV prevalence in the rural West Coast and Overberg districts has increased notably (Table 11).

Table 11: HIV prevalence estimates by districts among antenatal clinic attendees, Western Cape, 2006 and 2007.

Western Cape Province	2006			2007		
	N	Prev.(%)	CI (95%)	N	Prev. (%)	CI (95%)
Western Cape	3866	15.1	11.6 – 18.7	3830	12.6	10.1 – 15.6
Cape Wine (Boland)	528	13.2	10.4 - 16.1	514	12.8	10.1 – 16.1
Central Karoo	48	8.3	0.5 - 16.1	55	23.6	13.2 – 37.0
Eden	340	11.5	8.1 - 14.8	321	13.1	9.7 – 17.4
Metropol	2 572	17.0	15.5 - 18.4	2 590	16.1	14.7 – 17.5
Overberg	146	13.0	7.5 - 18.5	144	19.4	13.3 – 26.9
West Coast	232	7.3	4.0 - 10.7	206	10.2	6.4 – 15.2

N.B. The 95% CI was used because statistically the true estimated value falls within the two confidence limits and therefore assures us that there is 95% certainty that the estimated value is not by chance.

4.2.4 HIV prevalence estimates by age group

There is a gradual decline in HIV prevalence among women under 15 -19 years old, with 12.9% in 2007 compared with 13.7% in 2006 and 15.9% in 2005, with a slight overlap in confidence intervals (Table 12 and Figure 6). The decline in the women in this age group particularly, implies a reduction in new infections (incidence) in the general population. Similarly HIV prevalence estimates in the 20 - 24 year age group stand at 28.1% in 2007 compared with 28.0% in 2006 and 30.6% in 2005. Again this represents a notable decline from 2005.

Table 12: National HIV prevalence estimates by age group among antenatal clinic attendees, South Africa, 2005 – 2007.

Age Group (Years)	2005 HIV prev. (CI 95%)	2006 HIV prev. (CI 95%)	2007 HIV prev. (CI 95%)
15 – 19	15.9 (14.6 - 17.2)	13.7 (12.8 - 14.6)	12.9 (12.1 – 13.8)
20 – 24	30.6 (29.0 - 32.2)	28.0 (26.9 - 29.1)	28.1 (27.3 – 29.0)
25 – 29	39.5 (37.7 - 41.3)	38.7 (37.3 - 40.2)	37.9 (36.8 – 39.0)
30 – 34	36.4 (34.3 - 38.5)	37.0 (35.5 - 38.5)	40.2 (38.8 – 41.6)
35 – 39	28.0 (25.2 - 30.8)	29.3 (27.7 - 31.5)	33.2 (31.4 – 35.0)
>40	19.8 (16.1 - 23.6)	21.3 (18.5 - 24.1)	21.5 (16.9 – 27.1)

N.B. The 95% CI was used because statistically the true estimated value falls within the two confidence limits and therefore assures us that there is 95% certainty that the estimated value is not by chance.

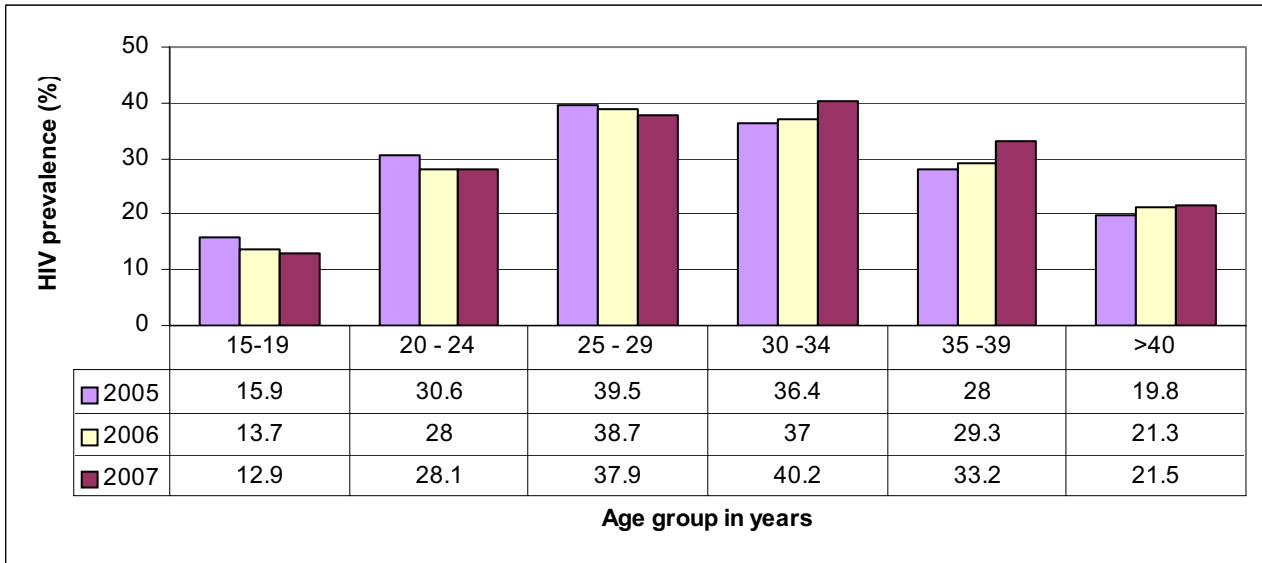


Figure 6: National HIV prevalence estimates by age group among antenatal clinic attendees, South Africa, 2005 – 2007.

The HIV prevalence estimate in older age groups (30 – 34 years and 35 – 39 years) is a concern as it remains at similar levels with a tendency towards an increase. The HIV prevalence has significantly increased in these specific age groups, from 37.0% in 2006 to 40.2% in 2007 and 29.30% in 2006 to 33.2% in 2007 respectively (Table 12).

The trends in HIV prevalence over the last 5 years show that there is gradual decline in HIV prevalence amongst participants in the age categories 15-19 years and 20-24 years and an incline in the older age groups (30 – 34 years and 35 – 39 years) (Figure 7).

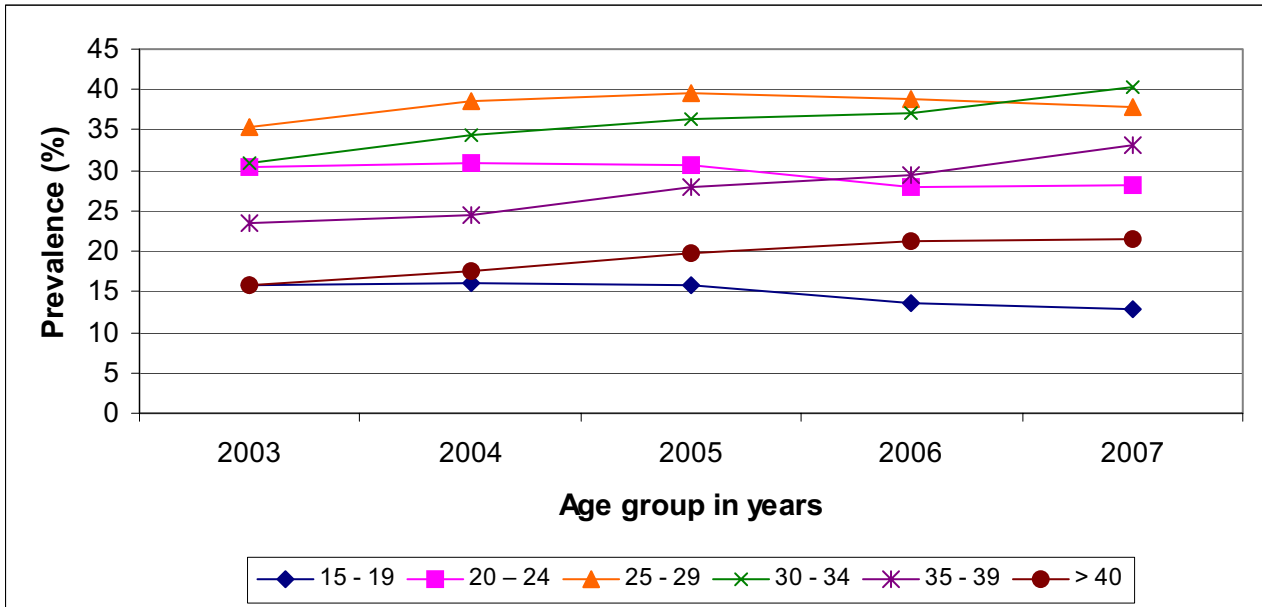


Figure 7: HIV prevalence trends by age group among antenatal clinic attendees, South Africa, 2003 – 2007.

4.3 SYPHILIS PREVALENCE

4.3.1 National syphilis prevalence estimates

This study found that 2.9 %, CI: 95% (2.5 – 3.5), of pregnant women presenting at public antenatal care clinics were infected with syphilis. This is higher than the 1.8% prevalence recorded for 2006. Figure 8 shows the trend of syphilis prevalence among attendees of antenatal clinics from 1997 to 2007.

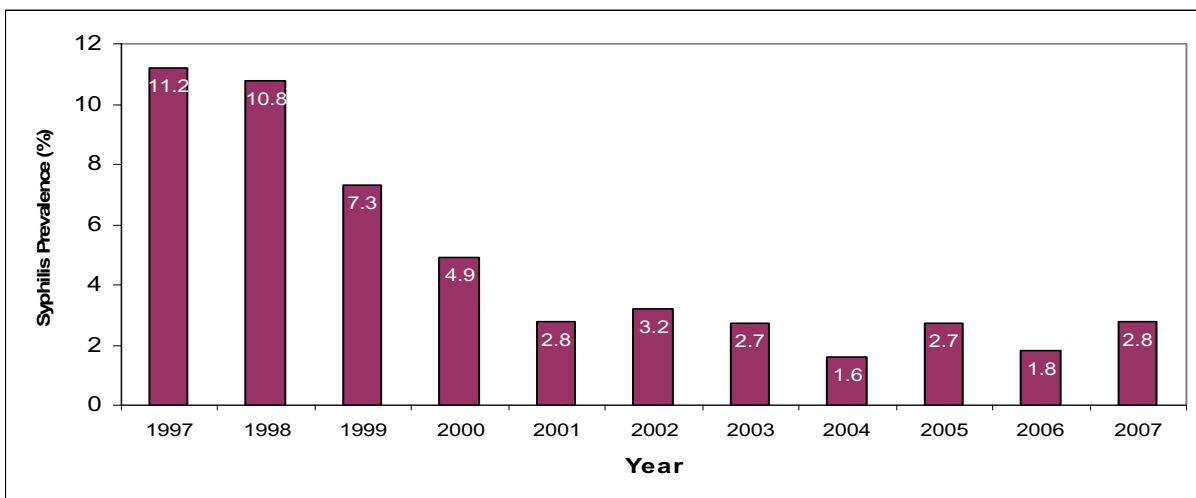


Figure 8: National Syphilis prevalence among antenatal clinic attendees, South Africa, 1997 – 2007.

4.3.2 Provincial syphilis prevalence estimates

The syphilis prevalence has been declining over the years. In 2006 however, it was still relatively high in the Northern Cape (6.9%) in comparison with the other provinces but has decreased slightly to 5.6% in 2007. Interestingly there was a marked fluctuation in the prevalence of syphilis in the Western Cape Province from 4.0% in 2005, down to 1.9% in 2006 and then 5.7% in 2007. In Gauteng, Limpopo and North West provinces syphilis prevalences have increased significantly from 2006 to 2007 (Table 13).

Table 13: Syphilis prevalence by province among antenatal clinic attendees, South Africa 2005 – 2007.

Province	RPR prev. 95% CI	RPR prev. 95% CI	RPR prev. 95% CI
	2005	2006	2007
Northern Cape	8.5 (6.1 - 10.8)	6.9 (5.0 - 8.9)	5.6 (4.2 – 7.3)
Gauteng	4.3 (3.5 - 5.1)	2.3 (1.9 - 2.7)	5.6 (3.8 – 8.1)
Western Cape	4.0 (3.1 - 4.9)	1.9 (1.4 - 2.4)	5.7 (4.3 – 7.4)
Free State	3.0 (2.0 - 4.0)	2.5 (1.8 - 3.1)	2.2 (1.6 – 3.2)
Mpumalanga	2.9 (1.6 - 4.2)	1.1 (0.7 - 1.5)	1.4 (1.0 – 2.0)
Eastern Cape	2.5 (1.9 - 3.1)	2.6 (2.0 - 3.1)	2.6 (2.1 – 3.2)
North West	1.9 (1.2 - 2.6)	1.8 (1.2 - 2.4)	2.7 (2.1 – 3.5)
KwaZulu-Natal	1.2 (0.7 - 1.6)	1.0 (0.8 - 1.4)	0.6 (0.5 – 0.8))
Limpopo	1.1 (0.6 - 1.5)	0.6 (0.4 - 0.9)	1.2 (0.9 – 1.6)
National	2.7 (2.5 - 3.0)	1.8 (1.7 - 2.0)	2.8 (2.6 – 3.0)

N.B. The 95% CI was used because statistically the true estimated value falls within the two confidence limits and therefore assures us that there is 95% certainty that the estimated value is not by chance.

4.3.3 Syphilis prevalence estimates by age group

Syphilis prevalence among antenatal clinic attendees in South Africa by age group for the years 2005 to 2007 is shown in Figure 8. There is an increase in prevalence between 2006 and 2007 in all age groups. It is important to note in relation to HIV prevalence rates that the lowest syphilis prevalence rate in 2007 was noted among women aged 15-19 years.

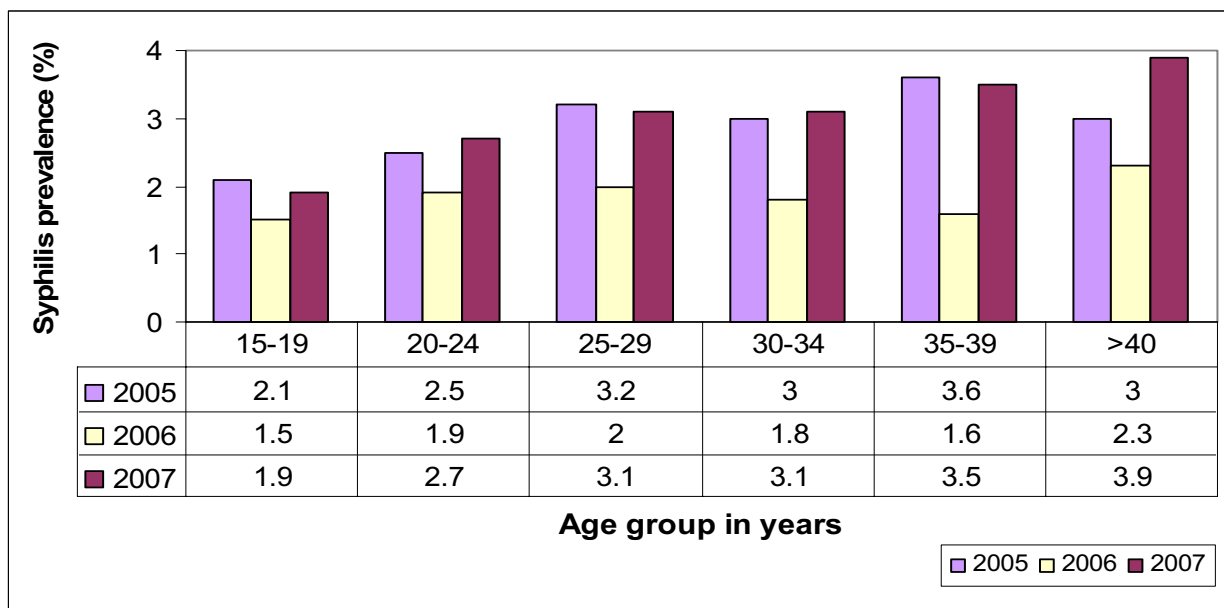


Figure 8: Syphilis prevalence trends by age group among antenatal clinic attendees, South Africa, 2005-2006.

4.4 Extrapolation of HIV prevalence to the general population

Antenatal surveys are not designed to provide information on HIV prevalence in the overall population (men, non-pregnant women and even children) who have HIV infection. These estimates are derived using mathematical models on the basis of antenatal survey data. In this study the Estimation and Projection Package (EPP) and Spectrum software UNAIDS Spectrum model (UNAIDS, 2002) have been used.

Using the spectrum model the estimate of the number of people who are estimated to have HIV infection is in approximately of 5.27 million. Whilst the number of people living with HIV infection is high, this adjusted estimate is more conservative than the previous estimate of 5.41 estimated in 2006. The HIV prevalence amongst adults 15-49 years is estimated at 17.64%. The current estimates for the other categories are shown in Table 14.

Table 14: HIV and AIDS estimates for South Africa in 2007

Parameter	2007
Adults age 15- 49 years	
HIV Prevalence (%)	17.64
Number living with HIV(millions)	5,27
Men	2.3
Women	2.8
Children age 0-14 years	
Number living with HIV	184,680
Total Population	

Using the spectrum model the estimated number of people who are estimated to have HIV infection is estimated at approximately 5.27 million. The HIV prevalence amongst adults 15-49 years is estimated at a range between 16.95% and 18.33%. The best (mid) estimate is 17.64%. The table above shows estimates for different categories.

5. DISCUSSION / CONCLUSIONS

This epidemiological surveillance shows that HIV infection remains a public health challenge in South Africa. These are the first results to show a comparison of the impact of HIV infection between districts over two consecutive years. It is important to note that there are several HIV epidemics occurring at the same time in South Africa, taking into account that there are different strains of the virus circulating and that their distribution is not well defined.

The findings of this study suggests for the second time that the South African HIV epidemic may be on a downward trend as suggested by the UNAIDS Spectrum Model (Appendix II).

However, there is no single factor that could be attributed to a decline in the epidemic when data are pooled. Several factors, whether they act singly or concurrently, play a role in understanding the dynamics of the epidemic. Triangulation of estimates of HIV incidence, AIDS related mortality and prevalence, would best describe the dynamics of the HIV transmission than any single measure.

Some of the factors which may possibly fuel the epidemic are AIDS related sexual behaviour and exposure to high risk groups (multiple partners, truck drivers, CSW, prisoners, mining communities etc). Factors that may contribute to a decline in the HIV infection rate are change in youth sexual behaviour; reduction in premarital vs. extramarital sexual behaviour; sexual abstinence; mutual faithfulness to one partner; knowing someone who died of an HIV related illness and fewer primary core carriers.

South Africa is a very diverse country in terms of socio-economic and cultural factors. These may have an impact on sexual risk behaviour, as shown by prevalence variations observed between provinces and even within districts in the same province. However, an in-depth understanding of the sexual behavioural risks/characteristics of communities at district level is needed to help us understand why the prevalence is not evenly distributed. Another important observation in 2007 is that HIV prevalence trends amongst participants in the age group 15-19 years continue to show a significant decline from 16.1% in 2004, to

15.9% in 2005, to 13.7% in 2006, to 12.9% in 2007. A decline in prevalence in this age group is suggestive of a decline in HIV incidence (new infections) and is a good indicator of the impact of intervention programmes. There was similarly a significant decline in the 20-24 year age group. This is important in that HIV prevalence in the 15 – 24 year age group is a key Millennium Development Goal (MDG) indicator. The findings suggest a sustained change in behaviour among young people (including engaging in safer sexual practices) may be taking place and this needs to be sustained as these youngsters mature.

The HIV prevalence estimate in older age groups (30 – 34 and 35 – 39 years) is a concern as it remains at similar levels with a tendency towards an increase. Whilst this may be as a result of cohort factor, it is a concern that HIV rates are high in these age groups due to older women being unable to moderate factors related to acquiring infection due to cultural circumstances.

Syphilis prevalence rates compared over the years (1998 to 2006) have shown a downward trend. This decrease may be attributed to a number of intervention activities and in particular, treatment of syndromes and management of STI's at public health facilities. However, this study found that 2.9 % of pregnant women presenting at public antenatal care clinics were infected with syphilis. This is higher than the 1.8% prevalence recorded for 2006. Effective prevention and treatment are the keys to success in this area. The STI syndrome management programme and the screening and treatment of syphilis are routine activities conducted at antenatal clinics. This programme alongside others is beginning to show the effectiveness of some intervention programmes.

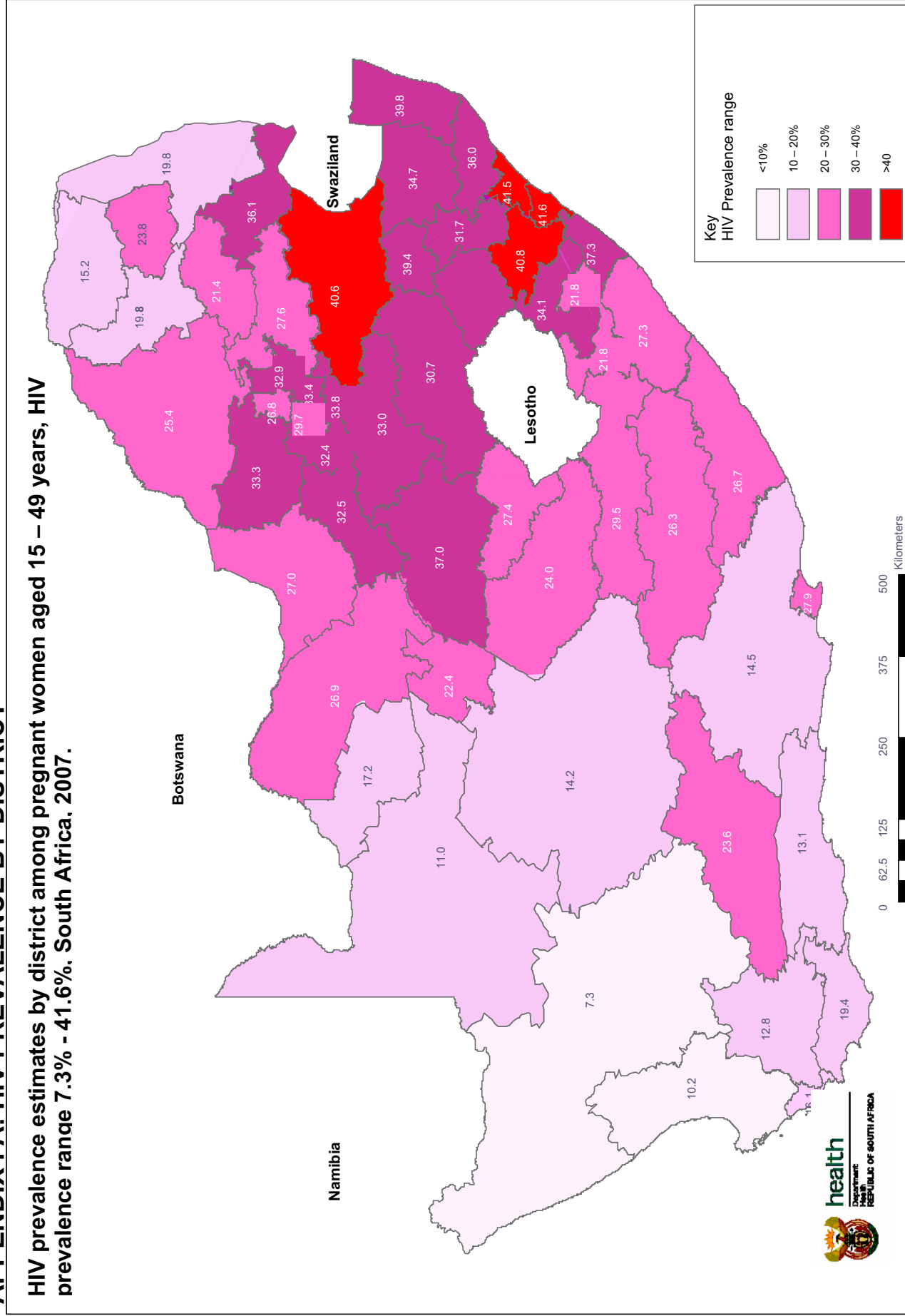
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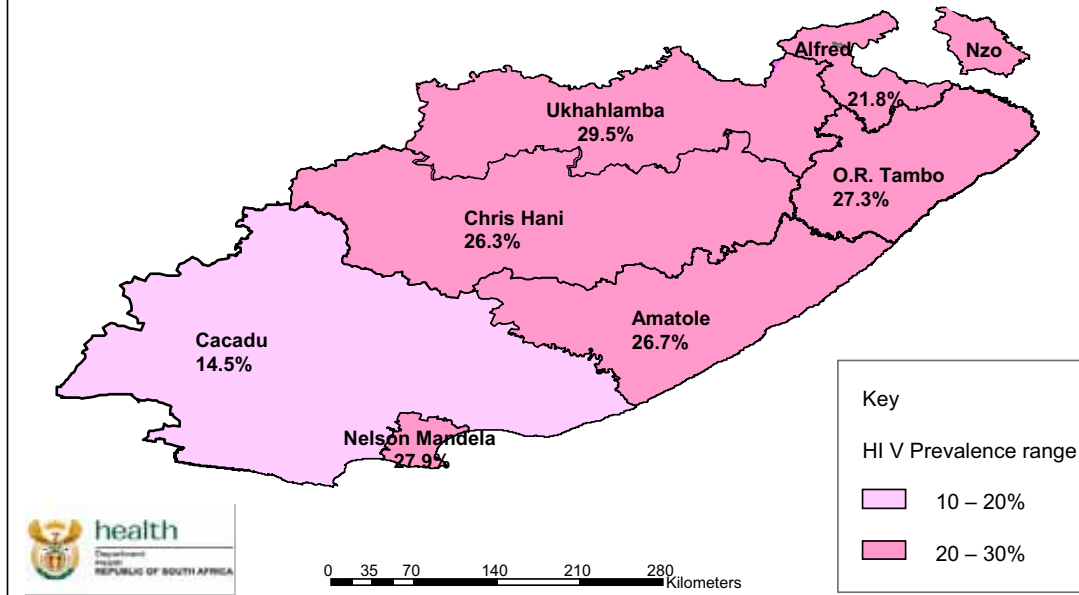
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APPENDIX I A: HIV PREVALENCE BY DISTRICT

HIV prevalence estimates by district among pregnant women aged 15 – 49 years, HIV prevalence range 7.3% - 41.6%, South Africa, 2007.

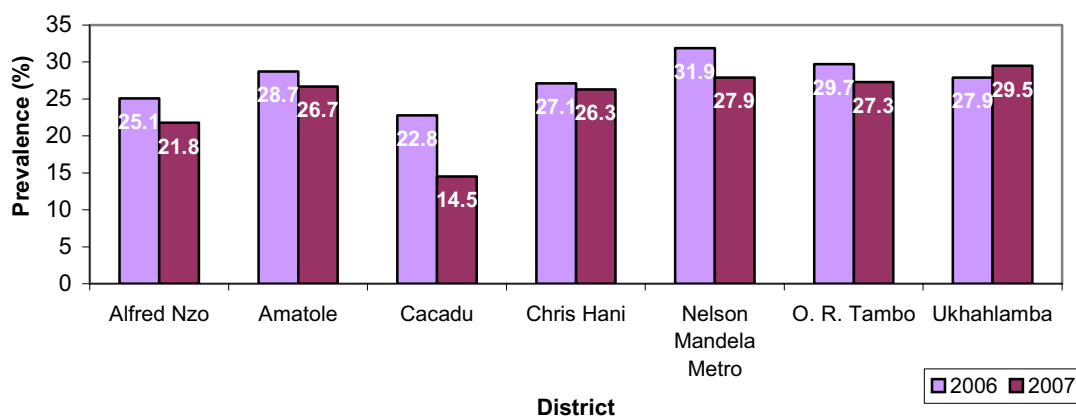


HIV prevalence estimates by district among antenatal clinic attendees, Eastern Cape, 2007.

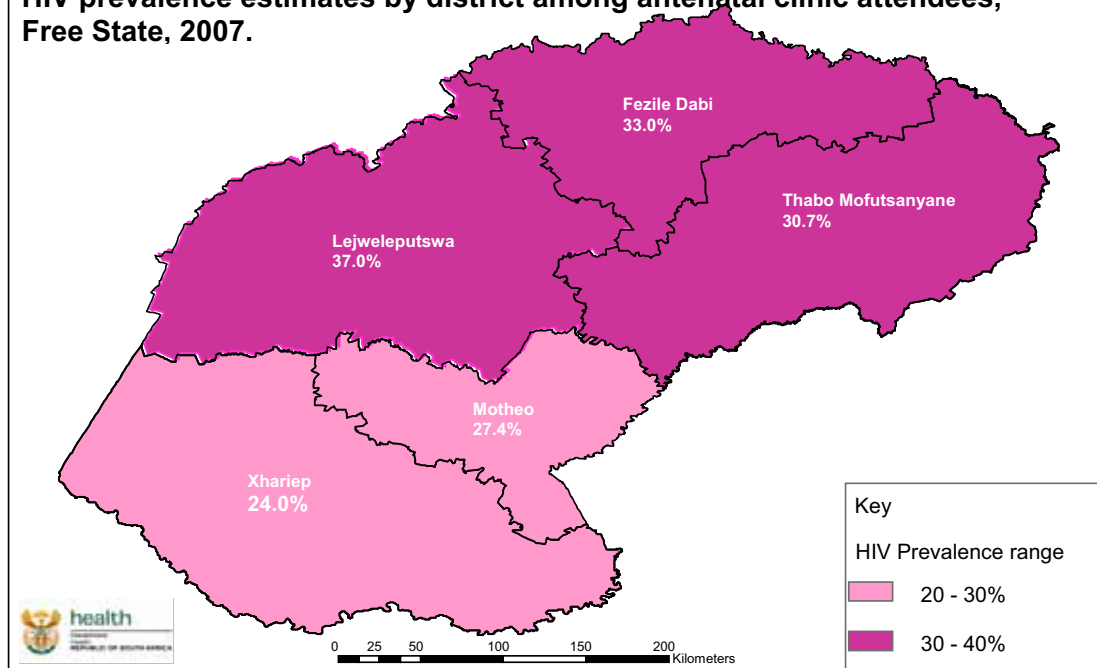


Eastern Cape Province	2006			2007		
	N	Prev. (%)	CI (95%)	N	Prev. (%)	CI (95%)
District	4074	28.6	26.8 - 30.4	4118	26.0	24.0 - 28.1
Alfred Ndzo	374	25.1	20.7 - 29.5	189	21.8	17.8 - 26.5
Amatole	1,061	28.7	26.0 - 31.5	1 058	26.7	22.5 - 31.3
Cacadu	254	22.8	17.7 - 28.0	269	14.5	9.23 - 22.34
Chris Hani	450	27.1	23.0 - 31.2	572	26.3	21.9 - 31.3
Nelson Mandela Metro	748	31.9	28.6 - 35.3	770	27.9	22.4 - 34.2
O. R. Tambo	983	29.7	26.8 - 32.6	1036	27.3	27.5 - 33.2
Ukahlamba	204	27.9	21.8 - 34.1	224	29.5	23.6 - 35.9

HIV prevalence estimates by district among antenatal clinic attendees, Eastern Cape Province, 2006 and 2007.

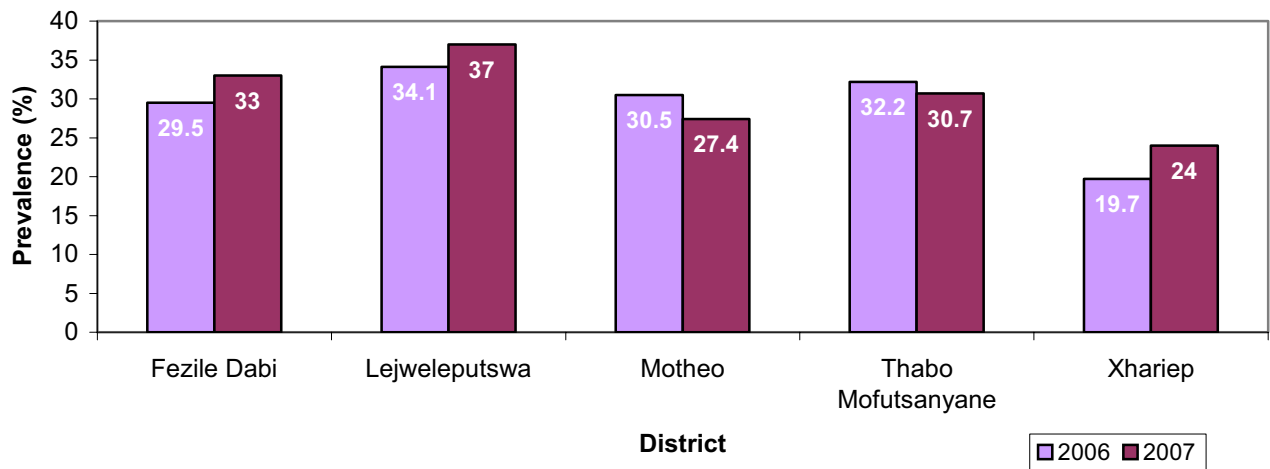


HIV prevalence estimates by district among antenatal clinic attendees, Free State, 2007.

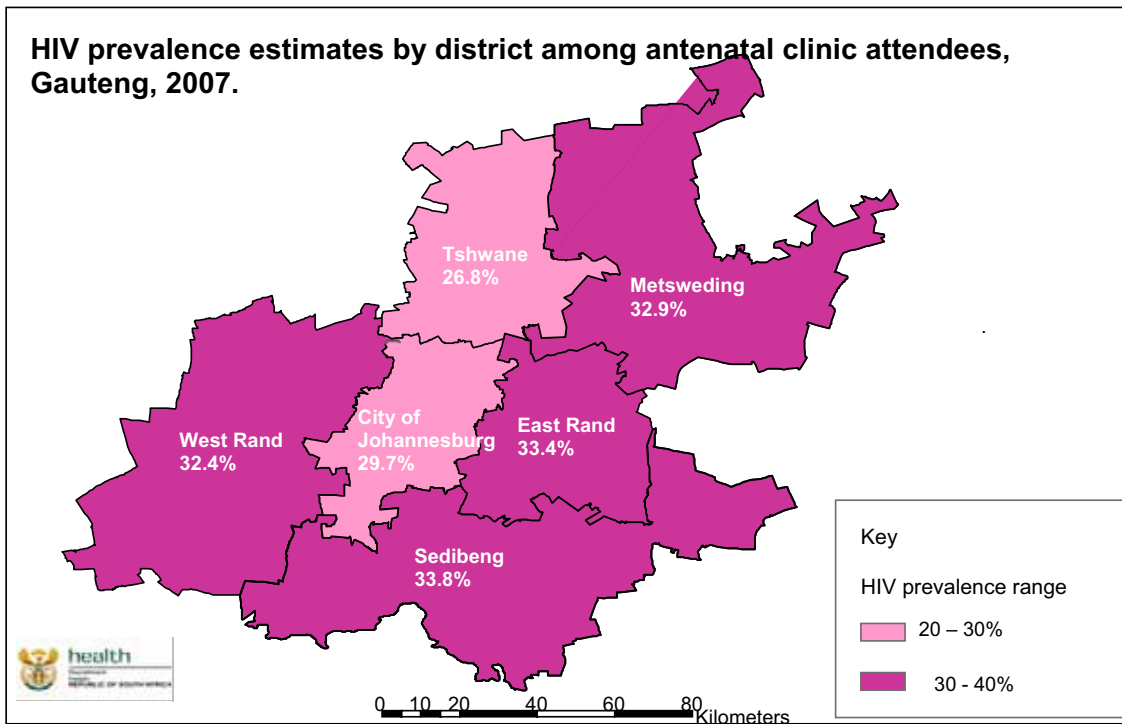


Free State Province	2006			2007		
	N	Prev (%)	CI (95%)	N	Prev (%)	CI (95%)
District	2225	31.1	29.2 - 33.1	2169	33.5	28.3 - 39.1
Fezile Dabi	383	29.5	24.9 - 34.1	361	33.0	28.2 - 38.1
Lejweleputswa	583	34.1	30.3 - 38.0	578	37.0	33.1 - 41.1
Motheo	580	30.5	26.8 - 34.3	565	27.4	23.8 - 31.3
Thabo Mofutsanyane	562	32.2	28.3 - 36.1	544	30.7	26.9 - 34.8
Xhariep	117	19.7	12.4 - 26.9	121	24.0	16.7 - 32.6

HIV prevalence estimates by district among antenatal clinic attendees, Free State Province, 2006 and 2007.

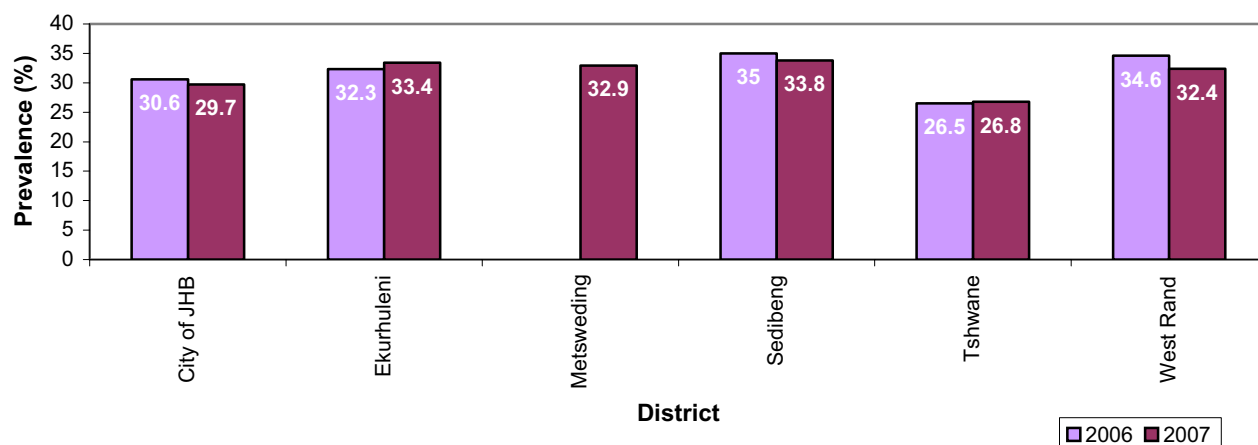


HIV prevalence estimates by district among antenatal clinic attendees, Gauteng, 2007.

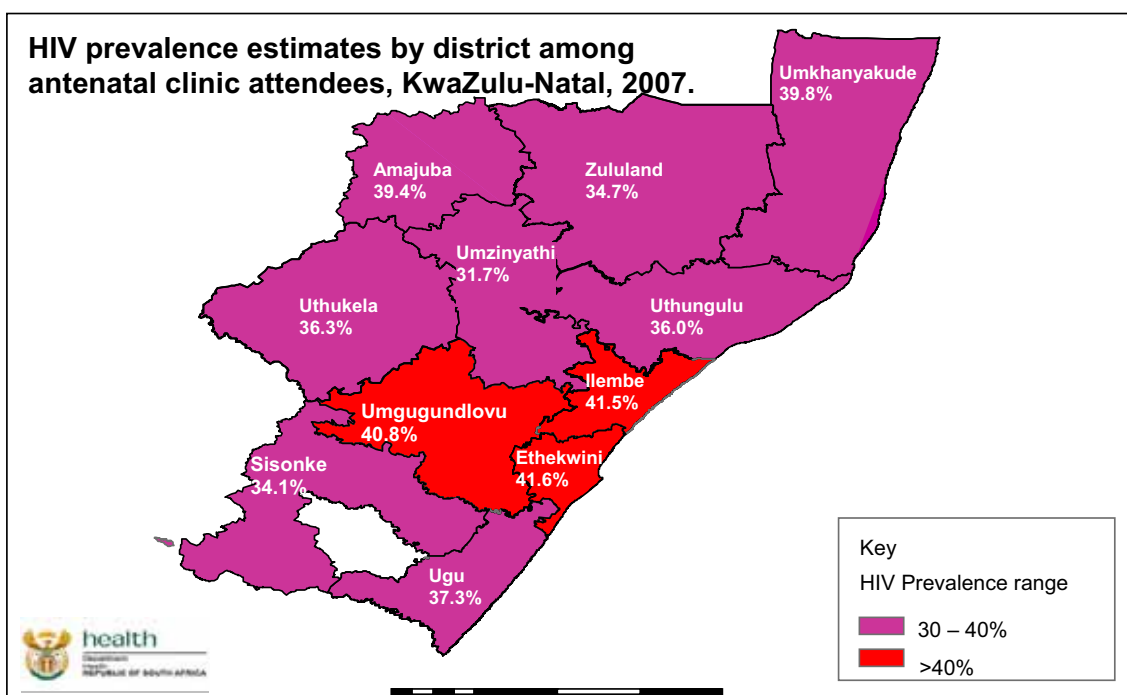


Gauteng Province	2006			2007		
	N	Prev (%)	CI (95%)	N	Prev (%)	CI (95%)
District	6145	30.8	29.6 - 32.1	7023	30.3	29.1 - 32.8
City of Johannesburg	2 399	30.6	28.8 - 32.5	2580	29.7	27.9 - 31.5
Ekurhuleni	1 765	32.3	30.1 - 34.5	1 795	33.4	31.2 - 35.6
Metsweding	***	***	***	70	32.9	22.1 - 45.1
Sedibeng	386	35.0	30.2 - 39.7	577	33.8	30.0 - 37.8
Tshwane	1 190	26.5	24.0 - 29.0	1 498	26.8	24.6 - 29.1
West Rand	405	34.6	30.0 - 39.2	503	32.4	28.4 - 36.7

HIV prevalence estimates by district among antenatal clinic attendees, Gauteng Province, 2006 and 2007.

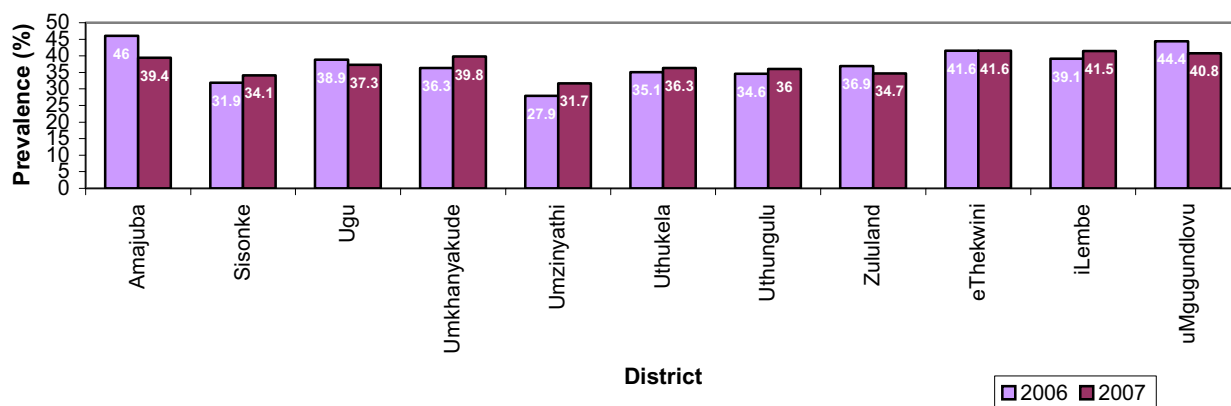


HIV prevalence estimates by district among antenatal clinic attendees, KwaZulu-Natal, 2007.

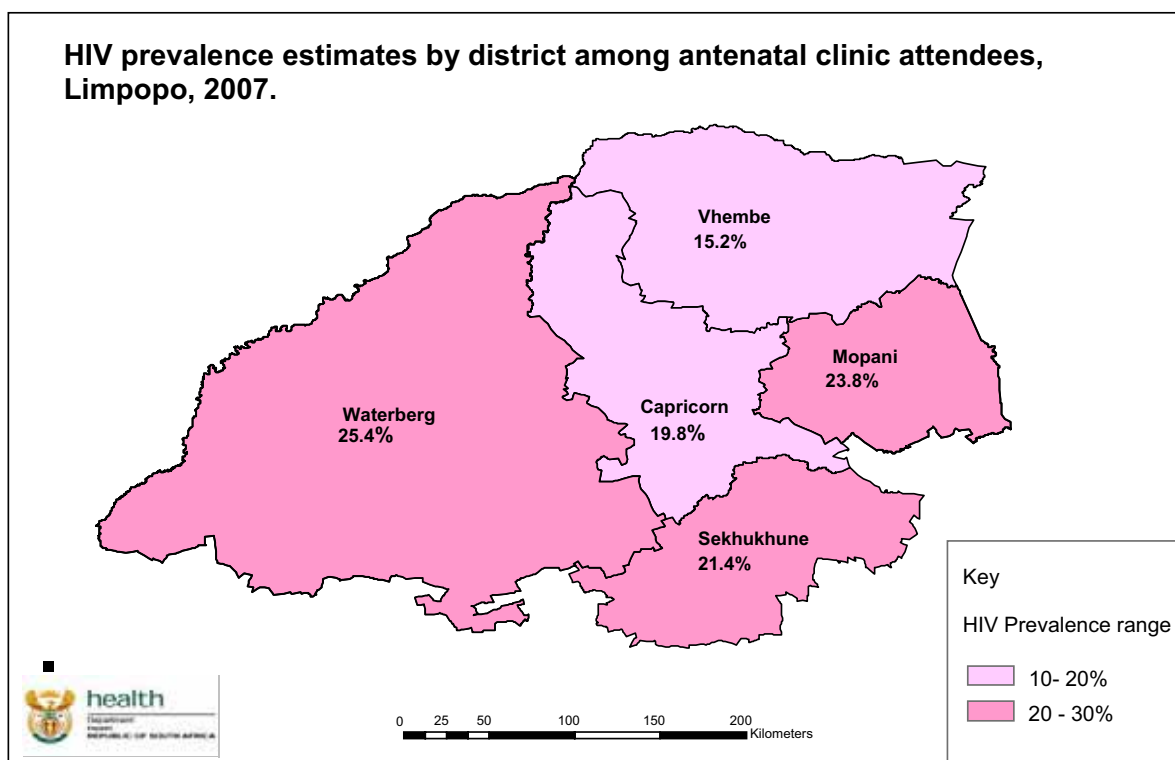


KwaZulu-Natal Province	2006			2007		
	N	Prev (%)	CI (95%)	N	Prev (%)	CI (95%)
District	6,814	39.1	37.5 – 40.7	6918	37.4	35.0 - 39.8
Amajuba	400	46.0	41.1 – 50.9	404	39.4	34.6 – 44.3
Sisonke	229	31.9	25.8 – 37.9	328	34.1	29.1 – 39.6
Ugu	504	38.9	34.6 – 43.1	512	37.3	33.1 – 41.7
Umkhanyakude	410	36.3	31.7 – 41.0	407	39.8	35.0 - 44.8
Umzinyathi	319	27.9	23.0 – 32.8	338	31.7	26.8 – 37.0
Uthukela	459	35.1	30.7 – 39.4	452	36.3	31.0 – 40.9
Uthungulu	566	34.6	30.7 – 38.5	567	36.0	32.0 – 40.1
Zululand	582	36.9	33.0 – 40.9	580	34.7	30.8 – 38.7
eThekweni	2,230	41.6	39.5 – 43.6	2 217	41.6	39.6 – 43.7
iLembe	419	39.1	34.5 – 43.8	417	41.5	36.7 – 46.4
UMgugundlovu	696	44.4	40.7 – 48.1	696	40.8	37.1 – 44.6

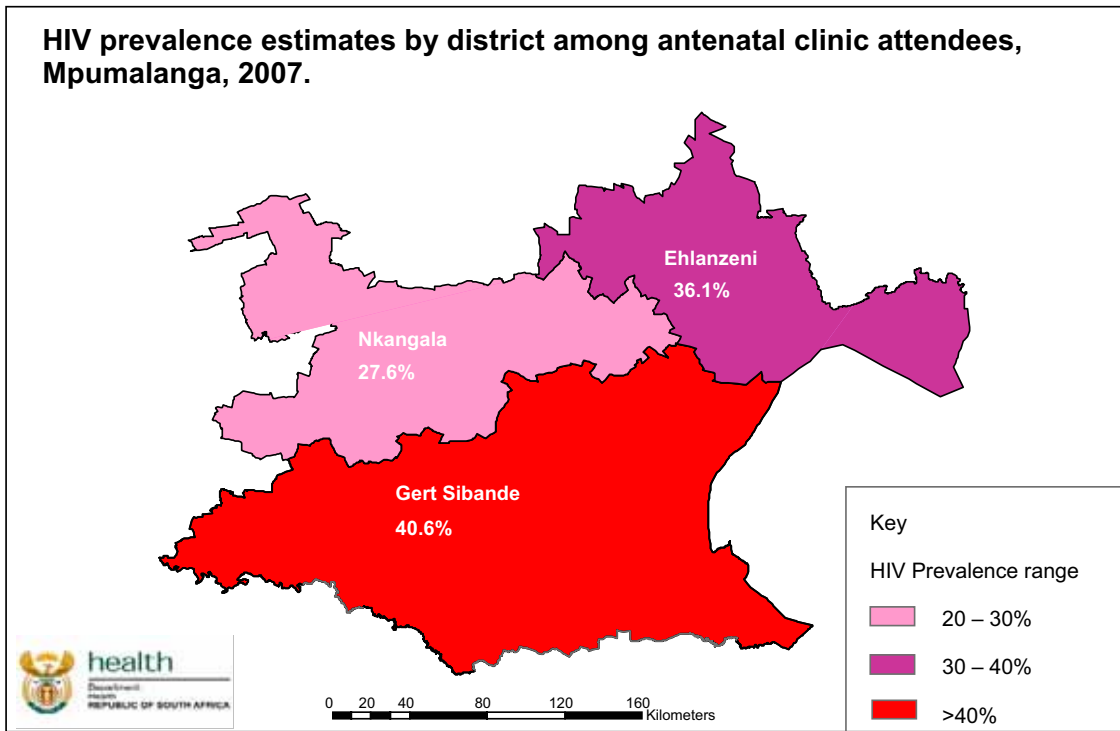
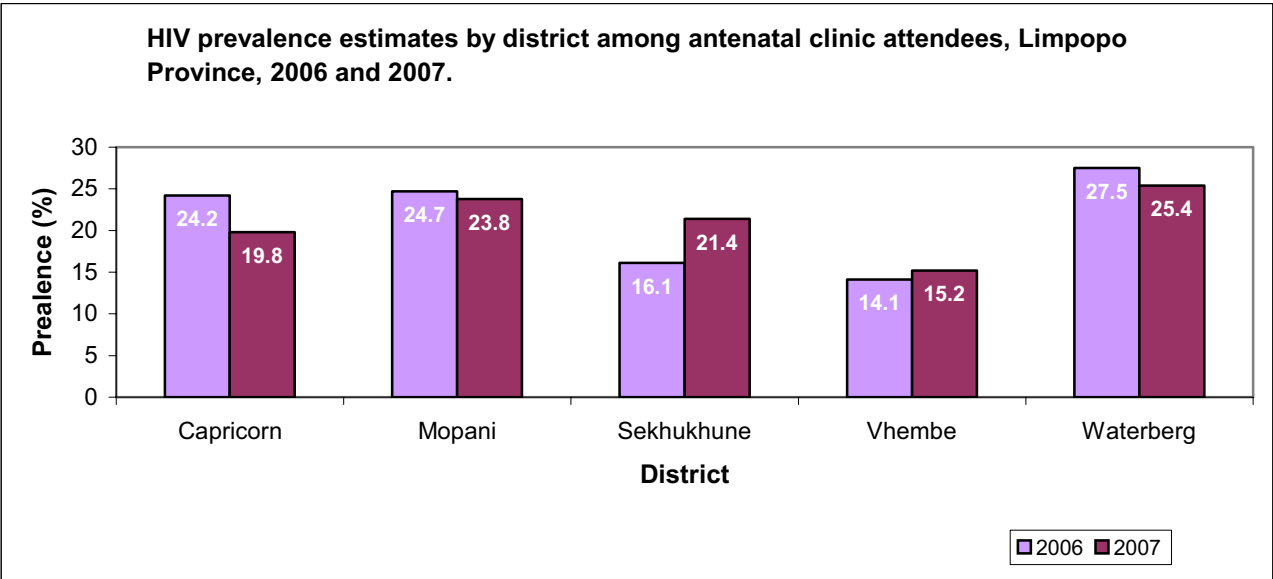
HIV prevalence estimates by district among antenatal clinic attendees years, KwaZulu-Natal Province, 2006 and 2007.



HIV prevalence estimates by district among antenatal clinic attendees, Limpopo, 2007.

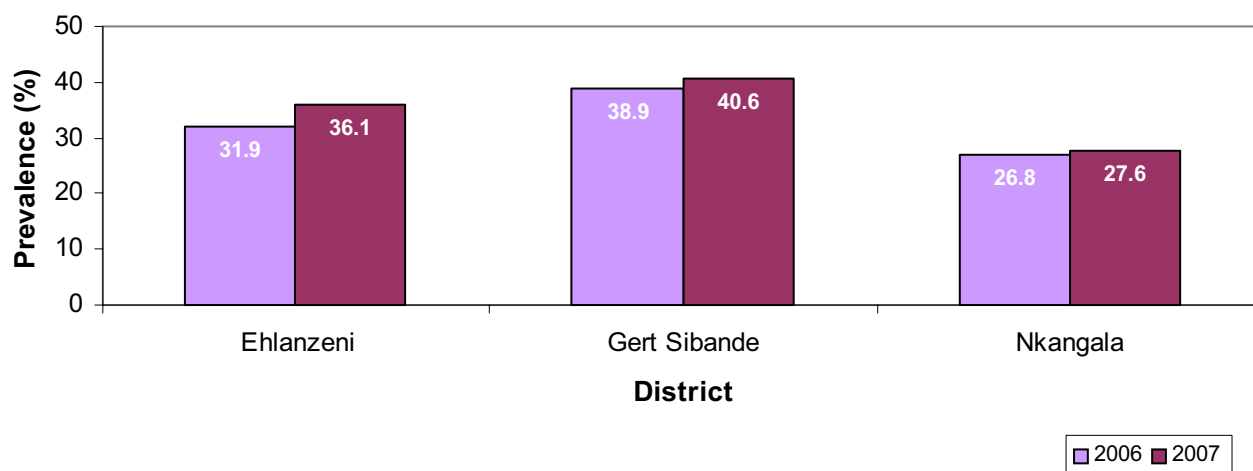


Limpopo Province	2006			2007		
	N	Prev (%)	CI (95%)	N	Prev (%)	CI (95%)
Limpopo	3,869	20.6	18.9 - 22.3	3748	18.5	16.7- 20.4
Capricorn	885	24.2	21.3 - 27.0	919	19.8	17.3 – 22.6
Mopani	723	24.7	21.6 - 27.9	655	23.8	20.6 – 27.3
Sekhukhune	772	16.1	13.5 - 18.6	772	21.4	18.6 – 24.5
Vhembe	954	14.1	11.9 - 16.4	922	15.2	13.0 – 17.7
Waterberg	535	27.5	23.7 - 31.3	480	25.4	21.6 – 29.6

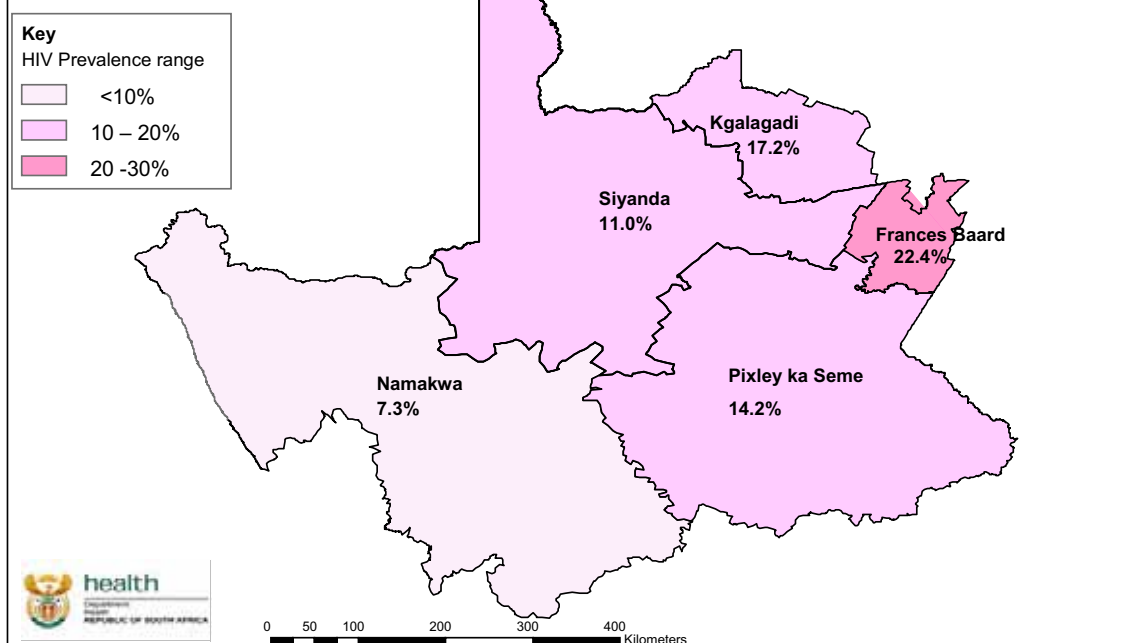


Province	2006			2007		
	N	Prev (%)	CI (95%)	N	Preva (%)	CI (95%)
Mpumalanga	2 212	32.1	29.8 – 34.4	2332	32.0	29.2 – 34.9
Ehlanzeni	1 040	31.9	29.1 – 34.8	1 061	36.1	33.2 – 39.1
Gert Sibande	530	38.9	34.7 – 43.0	564	40.6	36.5 – 44.8
Nkangala	642	26.8	23.4 – 30.2	707	27.6	24.3 – 31.1

HIV prevalence estimates by district among antenatal clinic attendees, Mpumalanga Province, 2006 and 2007.

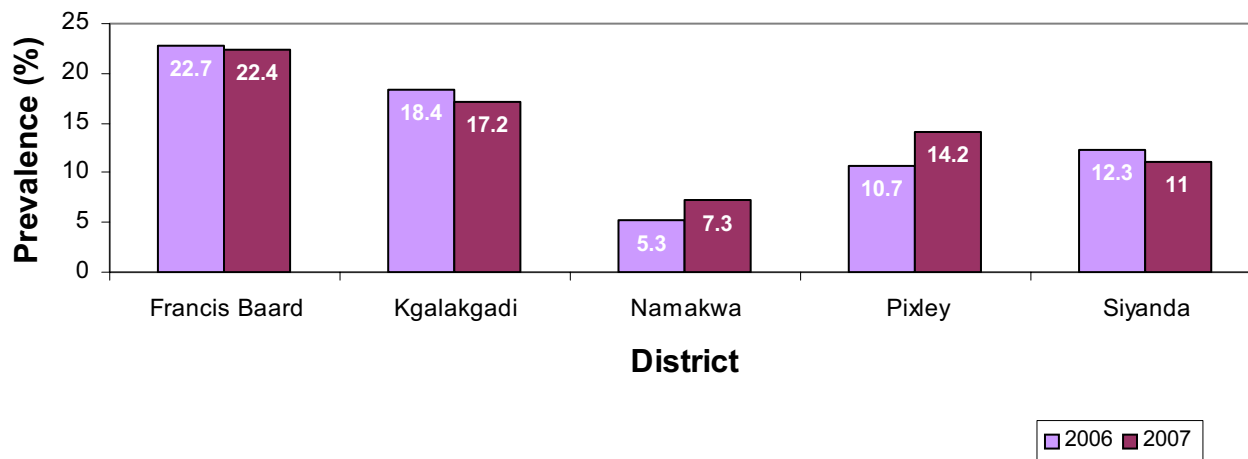


HIV prevalence estimates by district among antenatal clinic attendees, Northern Cape, 2007.

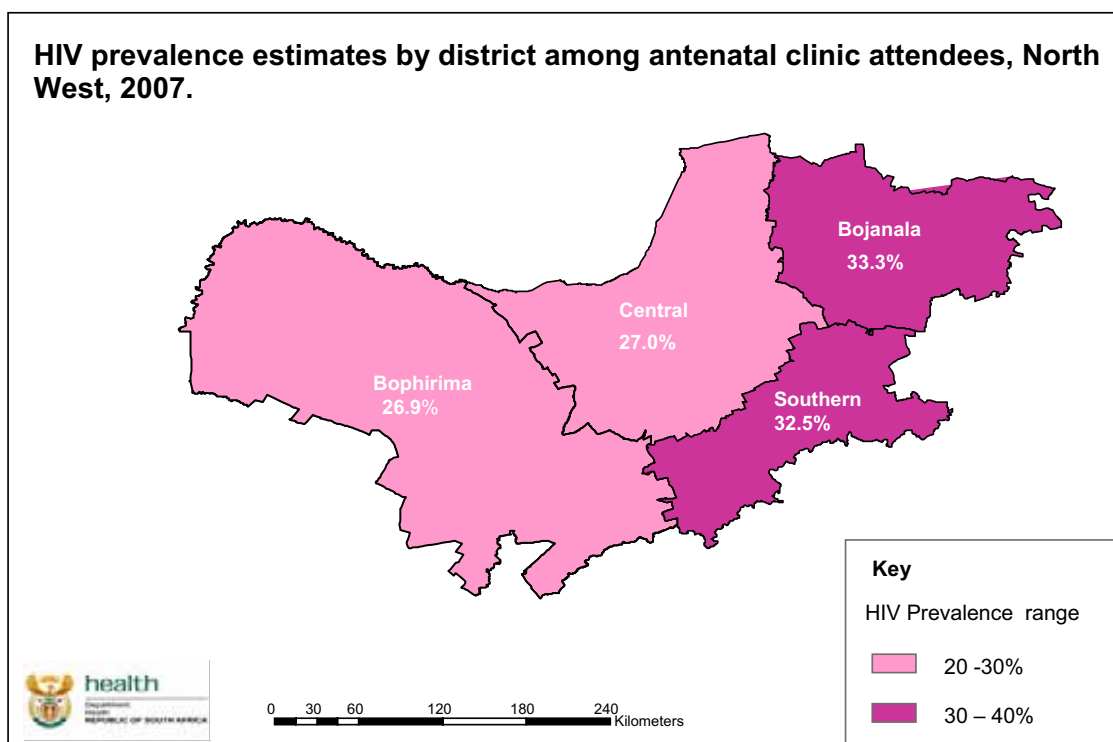


Northern Cape Province	2006			2007		
	N	Prev (%)	CI (95%)	N	Prev (%)	CI (95%)
Northern Cape	1,087	15.6	12.7 - 18.5	1190	16.1	13.9 - 18.7
F Baard	422	22.7	18.7 - 26.7	442	22.4	18.7 - 26.6
Kgalagadi	49	18.4	7.5 - 29.2	180	17.2	12.0 - 23.5
Namakwa	95	5.3	0.8 - 9.7	82	7.3	2.7 - 15.2
Pixley	253	10.7	6.9 - 14.5	232	14.2	10.0 - 19.4
Siyanda	268	12.3	8.4 - 16.2	254	11.0	7.5 - 15.5

HIV prevalence estimates by district among antenatal clinic attendees, Northern Cape Province, 2006 and 2007.

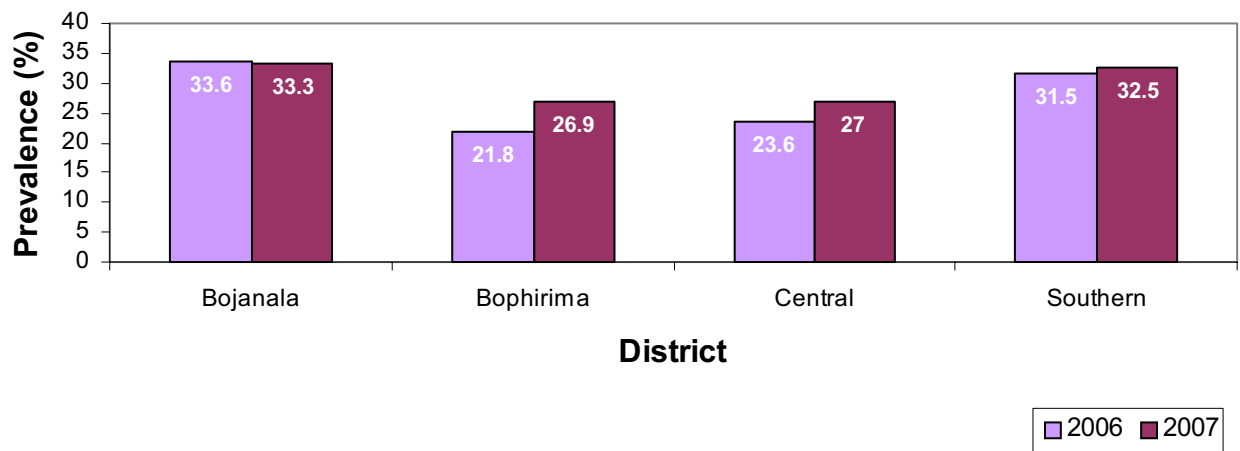


HIV prevalence estimates by district among antenatal clinic attendees, North West, 2007.

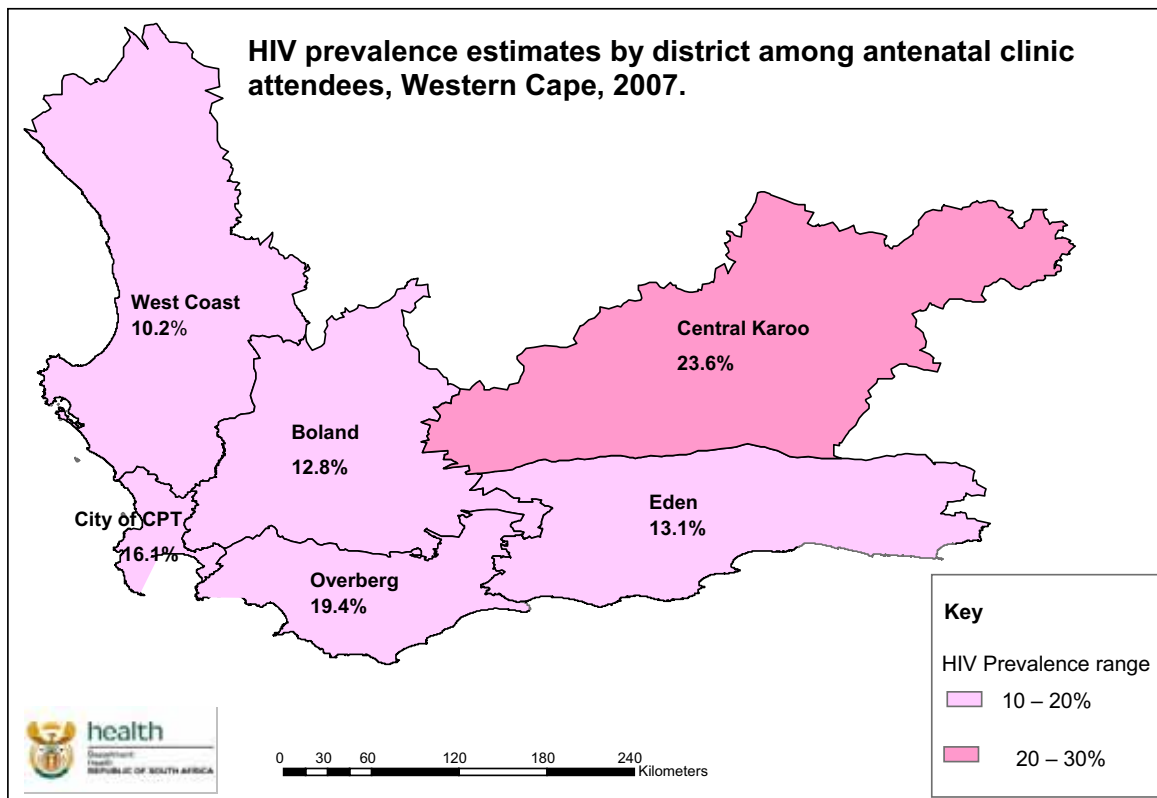


North-West Province	2006			2007		
	N	Preva (%)	CI (95%)	N	Preva (%)	CI (95%)
North West	2,742	29.0	26.9 – 31.1	2349	29.0	24.8 – 33.5
Bojanala	1 191	33.6	30.9 – 36.3	903	33.3	30.3 – 36.5
Bophirima	495	21.8	18.2 – 25.5	357	26.9	22.4 – 31.9
Central	564	23.6	20.1 – 27.1	544	27.0	23.4 – 31.0
Southern	492	31.5	27.4 – 35.6	545	32.5	28.6 – 36.6

HIV prevalence estimates by district among antenatal clinic attendees, North West Province, 2006 and 2007.

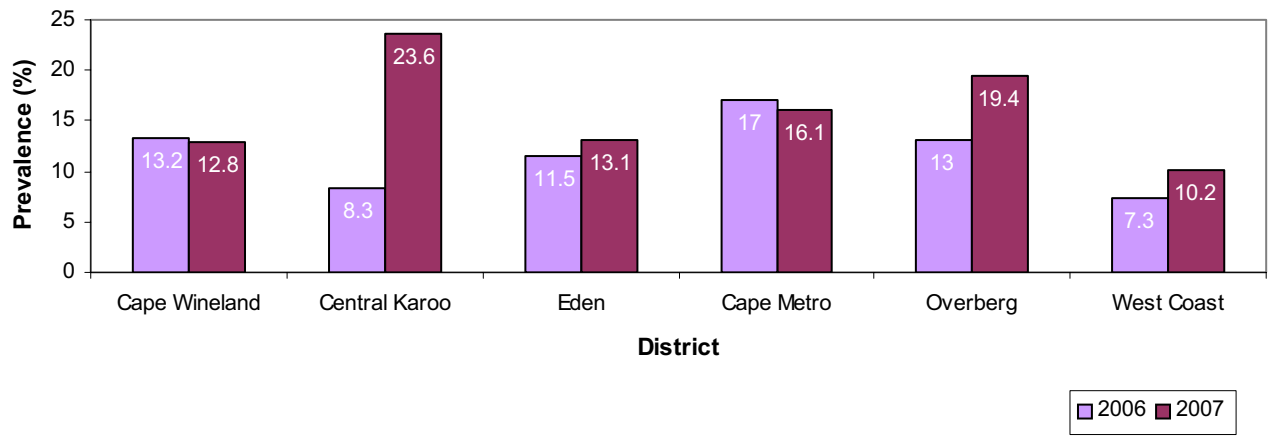


HIV prevalence estimates by district among antenatal clinic attendees, Western Cape, 2007.



Western Cape Province	2006			2007		
	N	Prev (%)	CI (95%)	N	Prev (%)	CI (95%)
Western Cape	3866	15.1	11.6 – 18.7	3830	12.6	10.1 – 15.6
Cape Wine (Boland)	528	13.2	10.4 - 16.1	514	12.8	10.1 – 16.1
Central Karoo	48	8.3	0.5 - 16.1	55	23.6	13.2 – 37.0
Eden	340	11.5	8.1 - 14.8	321	13.1	9.7 – 17.4
Metropol	2 572	17.0	15.5 - 18.4	2 590	16.1	14.7 – 17.5
Overberg	146	13.0	7.5 - 18.5	144	19.4	13.3 – 26.9
West Coast	232	7.3	4.0 - 10.7	206	10.2	6.4 – 15.2

HIV prevalence estimates by district among antenatal clinic attendees, Western Cape Province, 2006 and 2007



APPENDIX II: NATIONAL HIV PREVALENCE CURVE OBTAINED FROM PROVINCIAL DATA ENTERED INTO EPP (PROJECTED FROM SPECTRUM)

