

**REPORT  
NATIONAL HIV AND SYPHILIS PREVALENCE  
SURVEY  
SOUTH AFRICA  
2006**

**DEPARTMENT OF HEALTH SOUTH AFRICA**

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## ACRONYMS

AIDS	Acquired Immuno Deficiency Syndrome
ANC	Antenatal Care
BSS	Behavioural Surveillance Survey
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

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## FOREWORD

This report presents findings on the national antenatal survey that is conducted annually to track trends in HIV and AIDS prevalence in South Africa.

In 2006 the first extended antenatal survey was conducted. This survey has gone beyond providing HIV prevalence for provinces to giving prevalence rates for each of the 53 districts of South Africa. In keeping with the Department of Health policy to strengthen district health systems, it is envisaged that the district level estimates will provide valuable information for planning and the implementation of district programmes on HIV and HIV associated health programmes.

The 2006 survey has shown a reduction in HIV prevalence particularly in younger age groups and a tendency towards a reduction in HIV prevalence as a whole. This observation is very positive and calls for an even more concerted effort to sustain these gains and beyond. Once again the prevalence rates in the older age group remains a concern, suggesting the need for strengthening programmes to effectively reach all citizens.

The comprehensive approach to the challenge of HIV and AIDS implies a broad spectrum of appropriate interventions with an emphasis on prevention of HIV infection. This report provides valuable information required to implement public sector and inter-sectoral programmes such as the Operational Plan for Comprehensive HIV and AIDS Care, Management and Treatment of South Africa and the HIV and AIDS and STI Strategic Plan for South Africa 2007-2011.

Finally I would like to extend my personal gratitude to all South Africans who work tirelessly in the fight against HIV and AIDS and related health challenges.

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

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Finally very special thanks all the women who participated in the study and made this HIV trend review possible.

**MR THAMI MSELEKU**

**DIRECTOR-GENERAL: HEALTH**

## 1. INTRODUCTION

HIV infection and HIV and AIDS related conditions continue to be an important public health challenge. In a country experiencing a triple burden of disease with increases in chronic and non-communicable disease, conditions related to violence and injuries as well as communicable and infectious diseases; HIV related conditions have become increasingly important and challenging health concerns.

According to the Joint United Nations Programme on HIV/AIDS (UNAIDS) and the World Health Organisation (WHO), an estimated 39.5 million [34.1 million–47.1 million] people worldwide were living with HIV at the end of 2006. This number has risen from around 8 million in 1990 to nearly 40 million today, and is still growing with large increases in the Eastern European and Asian regions. UNAIDS estimates that approximately 63% of people living with HIV in the world are from the sub-Saharan Africa region. Women accounted for 48% of all adults living with HIV worldwide, and for 59% in sub-Saharan Africa.

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 2006 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 (for the first time) prevalence estimates for each district in the country in addition to the national and provincial rates. A total of 33034 pregnant women attending antenatal clinics participated from 1415 health facilities (compared to 16510 participants in 2005).

## **2. SURVEY METHODOLOGY**

### **2.1 Sampling procedures**

#### **2.1.1 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 a pregnancy. The demographic details of the participants except any particulars from which it may be possible to ascertain the identity of the patient were collected using standard collection forms. A unique field number (bar code number) 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.

#### **2.1.2 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 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 selection of sites was based on the following criteria:

- The clinic must be routinely drawing blood from attendees on the first visit of the current pregnancy and have the facilities to store it at 4°C.
- The clinic should provide service to sufficient first time antenatal clinic attendees to ensure that a minimum of 20 subjects will 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.

### **2.1.3 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 the 2<sup>nd</sup> October 2006 and ended on the 31<sup>st</sup> of October 2006.

## **2.2 Survey preparation**

The protocol and methodology were reviewed in a meeting with coordinators. In addition, survey workshops were held at the National Department of Health as well as in all the nine Provincial Health offices before the scheduled commencement date of the survey. These included provincial and laboratory coordinators, health information officers, communicable disease coordinators and facility nurses. The training covered criteria for selection of the sites, recruitment of the 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.

## **2.3 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. Routinely in the ANC clinics syphilis screening is done. Hence, syphilis screening was used as an entry point for HIV testing using anonymous unlinked procedures. Two blood samples were taken by vein 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 forms were checked alongside the blood samples by the supervisors for any mistakes and completeness. The samples, together with the forms were transported in a cooler box to the provincial participating laboratory where HIV and Syphilis testing was done.

## **2.4 Laboratory procedures**

### **2.4.1 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, Stellenbosch, MEDUNSA as well as the Virology laboratory of the University of KwaZulu-Natal.

### **2.4.2 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.

## **2.5 Data entry and analysis**

Data analysis was conducted at both the provincial and national levels using the STATA software package. The analysis was mainly focused on determining the prevalence rate of HIV and syphilis by age, district, and province. The National (overall) prevalence rates were also determined.

## **2.6 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.

## **2.7 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 generalisability and extrapolation to the population as a whole, women at ANC clinics are thought to provide an over-estimate of HIV prevalence. This has however been adjusted for using the spectrum model. In this study 217 out of 33034 did not provide the age of the participant. This is however unlikely to have substantially affected the age group estimates.

### 3. RESULTS

#### 3.1 Distribution and characteristics of study participants

A total number of 33,034 pregnant women participated in the antenatal survey, doubling the previous sample size of 16,510 in 2005.

##### *Distribution by province:*

The distribution of participants in the antenatal surveys from 2004 to 2006 is shown in Table 1a.

**Table 1a: Antenatal survey participants for 2004, 2005 and 2006 by province**

Province	2004	%	2005	%	2006	%
Eastern Cape	1711	10.7	2189	13.3	4074	12.3
Free State	1016	6.3	935	5.7	2225	6.7
Gauteng	3169	19.7	3110	18.8	6145	18.6
Kw aZulu-Natal	3522	21.9	3500	21.2	6814	20.6
Limpopo	1894	11.8	1897	11.5	3869	11.7
Mpumalanga	1114	6.9	1027	6.2	2212	6.7
Northern Cape	494	3.1	567	3.4	1087	3.3
North West	1192	7.4	1325	8.0	2742	8.3
Western Cape	1952	12.2	1960	11.9	3866	11.7
<b>Total</b>	<b>16064</b>	<b>100</b>	<b>16510</b>	<b>100</b>	<b>33034</b>	<b>100</b>

##### *Distribution by age group:*

Table 1b shows the distribution of Antenatal survey participants by age group for the years 2004 to 2006. 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.

Teenagers (<20 year age group) constituted approximately 19% of all participants in the survey and 8% were under 18 years old. The proportion of women aged over 40 years constituted approximately 3% of all participants.

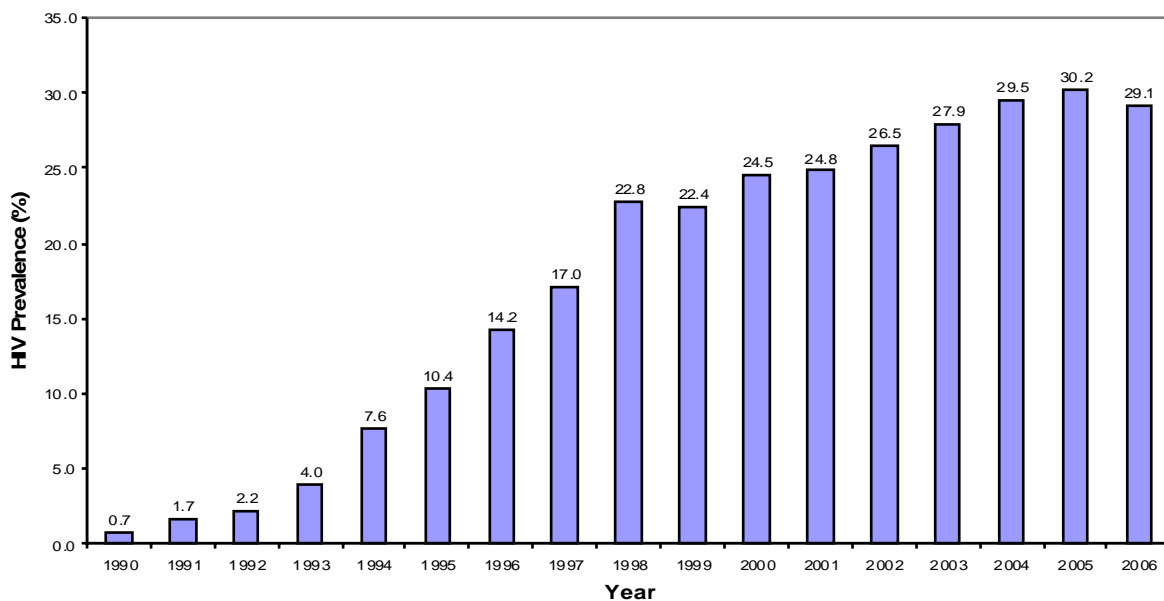
**Table 1b: Antenatal survey participants for 2004 to 2006 by Age Group**

Age	2004	%	2005	%	2006	%
< 20	3133	19.5	3334	20.2	6299	19.1
20 – 24	4992	31.1	5068	30.7	10478	31.7
25 – 29	3702	23.0	3906	23.7	7661	23.2
30 – 34	2510	15.6	2534	15.3	5018	15.2
35 – 39	1261	7.8	1246	7.5	2531	7.7
40 – 44	350	2.2	356	2.2	735	2.2
45+	37	0.2	52	0.3	95	0.3
Missing	79	0.5	14	0.08	217	0.7
<b>Total</b>	<b>16064</b>	<b>100.0</b>	<b>16510</b>	<b>100.0</b>	<b>33034</b>	<b>100.0</b>

### 3.2 HIV Prevalence

#### 3.2.1 National HIV Prevalence

This survey is designed to provide trends in HIV prevalence. Based on the results of the survey; it is estimated that nationally, **29.1%** (CI 28.3% - 31.2%) of pregnant women were HIV positive in 2006. This is in comparison with a prevalence rate of **30.2%** (CI 29.1% - 31.2%) in 2005 (Department of Health, 2005). This finding suggests for the first time that the South African epidemic may be beginning a downward trend as suggested by the UNAIDS Spectrum model (annexure 2). This trend will need to be observed carefully for confirmation in the next few years.



**Figure 1: National HIV prevalence trends among antenatal clinic attendees in South Africa: 1990 to 2006**

### 3.2.2 Provincial HIV prevalence

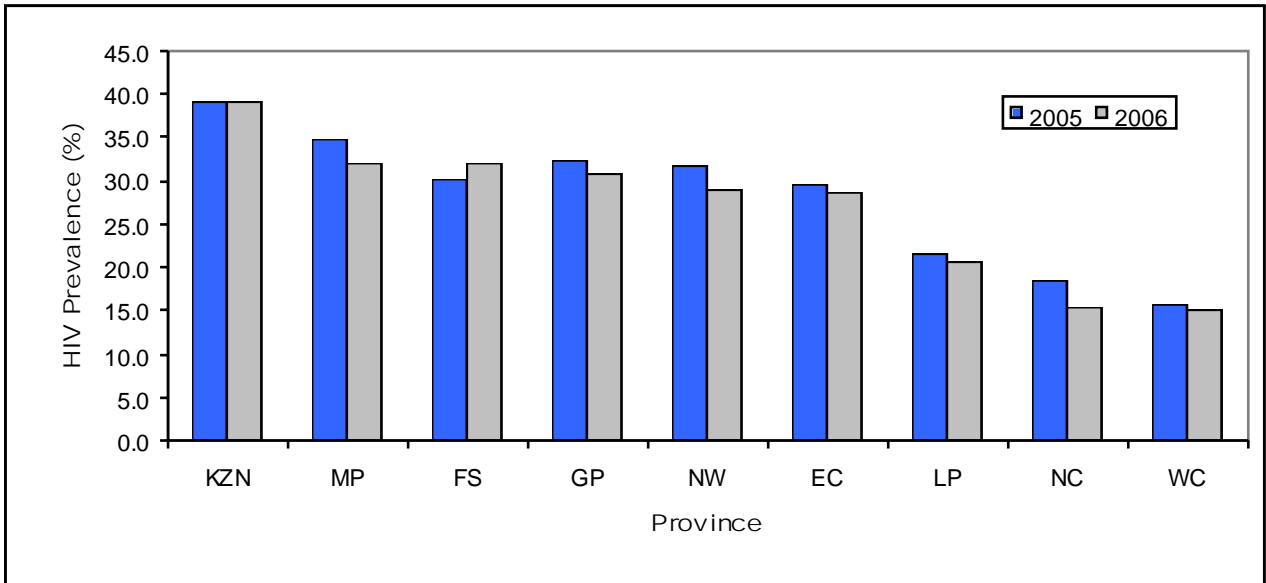
The pattern of provincial prevalence shows that the epidemic has progressed at a different pace in the different provinces. Table 2 and Figure 2 show that trends remain similar to those observed in previous years with KwaZulu-Natal having the highest prevalence and the Western Cape followed by the Northern Cape reporting the lowest estimated rates.

In comparison with figures for 2005, HIV prevalence has not changed significantly in six provinces. No increases were noted apart from a slight upward trend in the Free State.

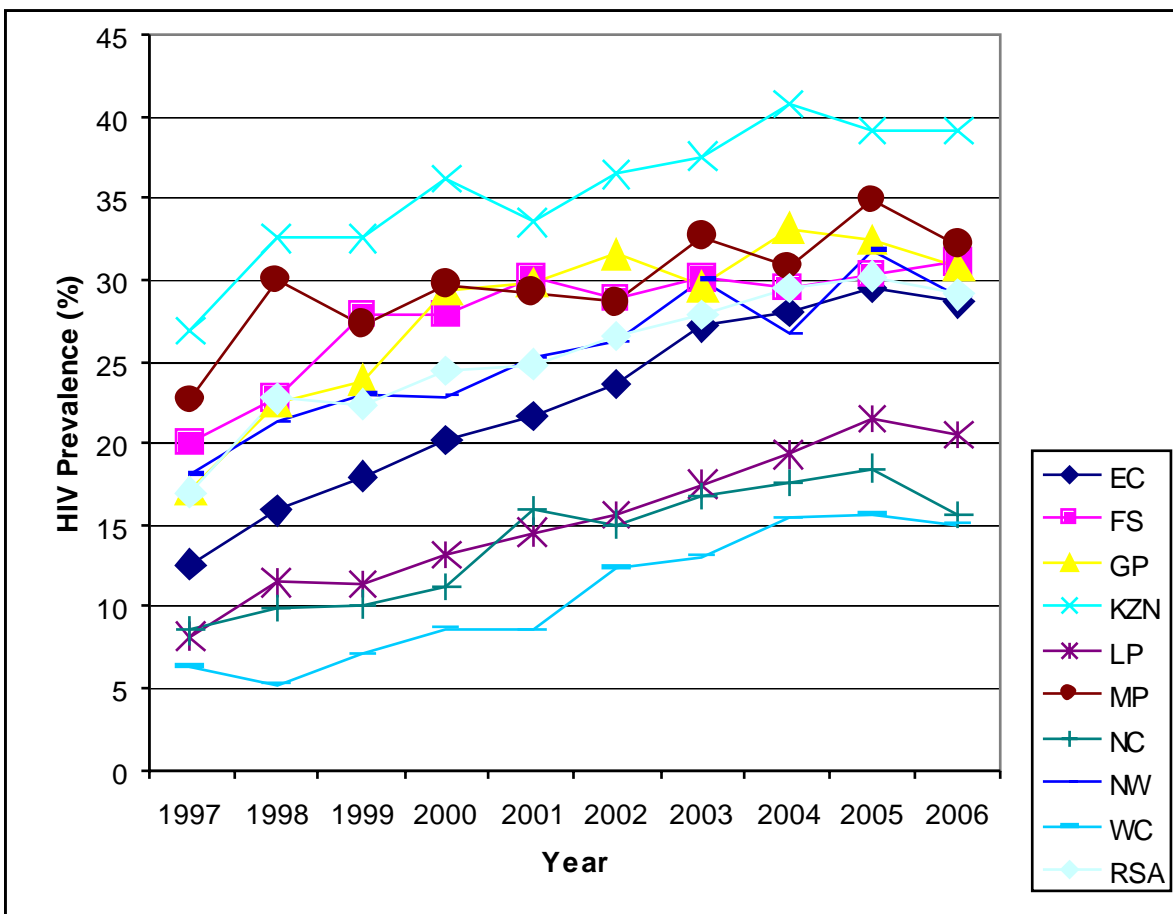
**Table 2: Provincial HIV prevalence estimates: Antenatal clinic attendees, South Africa 2004-2006**

Province	HIV pos. 95% CI 2004	HIV pos. 95% CI 2005	HIV pos. 95% CI 2006
KwaZulu-Natal	40.7 (38.8 - 42.7)	39.1 (36.8 - 41.4)	39.1 (37.5 - 40.7)
Mpumalanga	30.8 (27.4 - 34.2)	34.8 (31.0 - 38.5)	32.1 (29.8 - 34.4)
Free State	29.5 (26.1 - 32.9)	30.3 (26.9 - 33.6)	31.1 (29.2 - 33.1)
Gauteng	33.1 (31.0 - 35.3)	32.4 (30.6 - 34.3)	30.8 (29.6 - 32.1)
North West	26.7 (23.9 - 29.6)	31.8 (28.4 - 35.2)	29.0 (26.9 - 31.1)
Eastern Cape	28.0 (25.0 - 31.0)	29.5 (26.4 - 32.5)	28.6 (26.8 - 30.4)
Limpopo	19.3 (16.8 - 21.9)	21.5 (18.5 - 24.6)	20.6 (18.9 - 22.3)
Northern Cape	17.6 (13.0 - 22.2)	18.5 (14.6 - 22.4)	15.6 (12.7 - 18.5)
Western Cape	15.4 (12.5 - 18.2)	15.7 (11.3 - 20.1)	15.1 (11.6 - 18.7)
<b>National</b>	<b>29.5 (28.5 - 30.5)</b>	<b>30.2 (29.1 - 31.2)</b>	<b>29.1 (28.3 - 29.9)</b>

N.B. The true value is estimated to fall within the two confidence limits, thus the confidence interval is important to refer to when interpreting data.



**Figure 2: HIV prevalence by province among antenatal clinic attendees in South Africa, 2005-2006**



**Figure 3: Provincial HIV prevalence trends among antenatal clinic attendees in South Africa, 1997- 2006**

### 3.2.3 HIV prevalence by age group

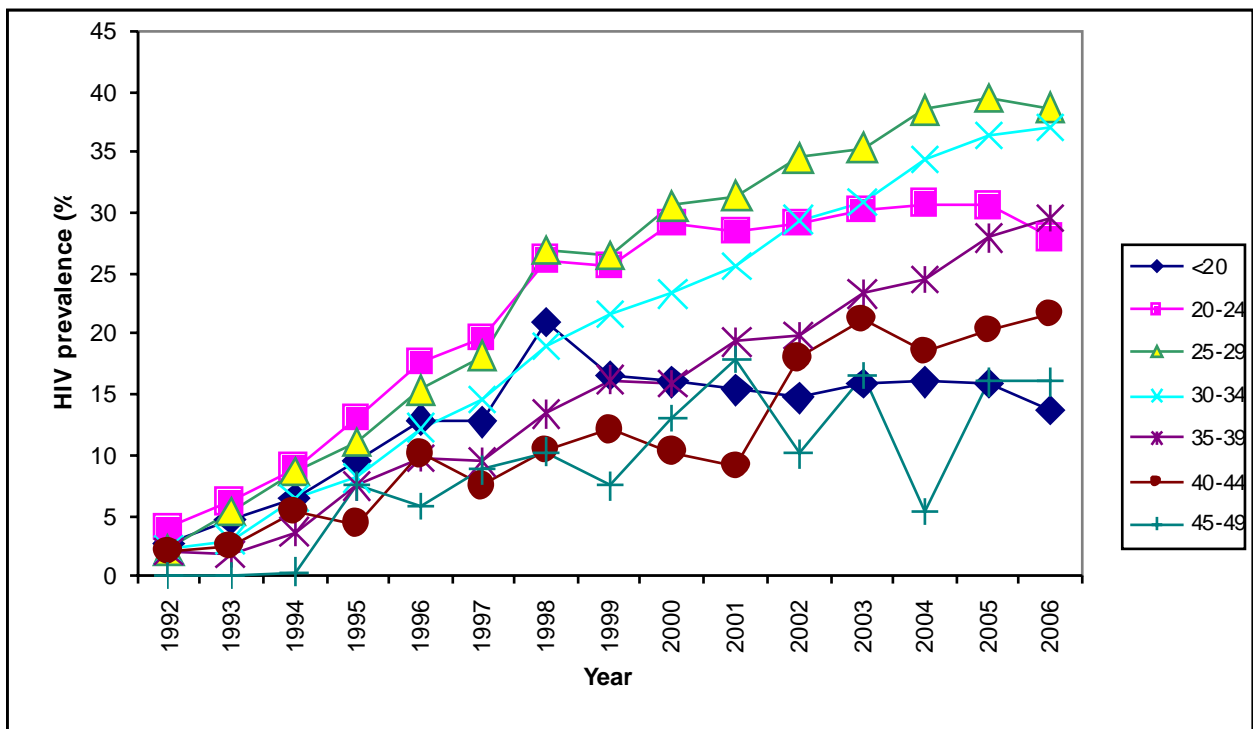
There are different trends in HIV prevalence between the younger and older age groups. An important finding of this study was the significant decline in HIV prevalence amongst participants under the age of 20 years. In this group HIV prevalence was estimated at 13.7% in comparison to 15.9% in 2005. This observation may be an indicator of declines in HIV incidence in this age group. HIV prevalence in the 20 to 25 year age group has also decreased in comparison to 2005. There was however, an increase in HIV prevalence amongst women in the 30 to 39 year age group as shown in Table 3 and Figure 4. This could be partly attributed to a cohort effect referring to the fact that women in the younger age groups, who may already be infected, move into an older age cohort.

**Table 3: HIV prevalence by age group among antenatal clinic attendees, South Africa: 2004-2006**

Age Group (Years)	HIV prev. (CI 95%) 2004	HIV prev. (CI 95%) 2005	HIV prev. (CI 95%) 2006
<20	16.1 (14.7 - 17.5)	15.9 (14.6 - 17.2)	13.7 (12.8 - 14.6)
20 – 24	30.8 (29.3 - 32.3)	30.6 (29.0 - 32.2)	28.0 (26.9 - 29.1)
25 – 29	38.5 (36.8 - 40.3)	39.5 (37.7 - 41.3)	38.7 (37.3 - 40.2)
30 – 34	34.4 (32.2 - 36.6)	36.4 (34.3 - 38.5)	37.0 (35.5 - 38.5)
35 – 39	24.5 (21.9 - 27.2)	28.0 (25.2 - 30.8)	29.3 (27.7 - 31.5)
40+	17.5 (14.0 - 21.0)	19.8 (16.1 - 23.6)	21.3 (18.5 - 24.1)

Note: 1. The true value is estimated to fall within the two confidence limits, thus the Confidence interval (CI) is important to refer to when interpreting data;

2. The sample size for women in the 40 to 49 year age group is small. Thus the prevalence rate in this group should be read with caution, as confidence intervals are wide.



**Figure 4: HIV prevalence by age group among antenatal clinic attendees in South Africa, 1992-2006**

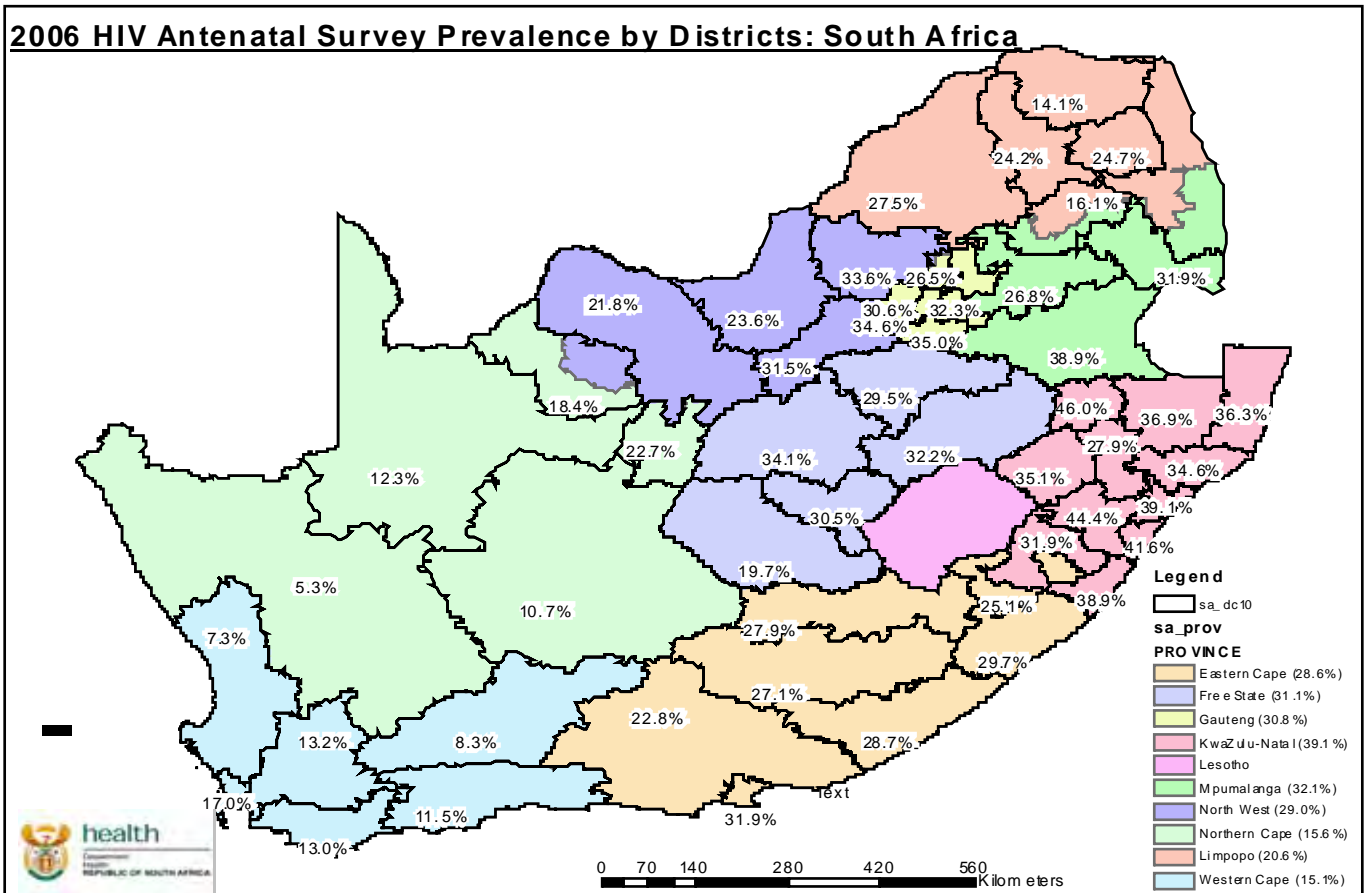
### 3.2.4 HIV prevalence by district

The 2006 survey is different from previous surveys in that the sample size was increased to enable an adequate statistical power to obtain HIV prevalence estimates for each district of South Africa. The district estimates provide more information for planning at district level.

Table 4 and Figure 5 show the distribution of HIV prevalence by District in 2006. HIV prevalence rates in districts show variations in district prevalence rates within districts. It is interesting to note for example that the district with the lowest HIV prevalence is recorded from the Northern Cape (5.3%) where the variation between the lowest and highest district is approximately 17%. Intra-provincial variations are equally wide for provinces such as Free State and KwaZulu-Natal, (19.7% to 34.1%; 27.9% to 46.0%; respectively). Maps showing the HIV prevalence by district for each province are shown in Annexure 1.

**Table 4: District HIV prevalence range among antenatal clinic attendees by province**

Province	Provincial Prevalence(%)	District Prevalence Range (%)
Eastern Cape	28.6	22.8 - 31.9
Free State	31.1	19.7 - 34.1
Gauteng	30.8	26.5 - 35.0
KwaZulu-Natal	39.1	27.9 - 46.0
Limpopo	20.6	14.1 - 27.5
Mpumalanga	32.1	26.8 - 38.9
Northern Cape	15.6	5.3 - 22.7
North West	29.0	21.8 - 33.6
Western Cape	15.1	7.3 - 17.0



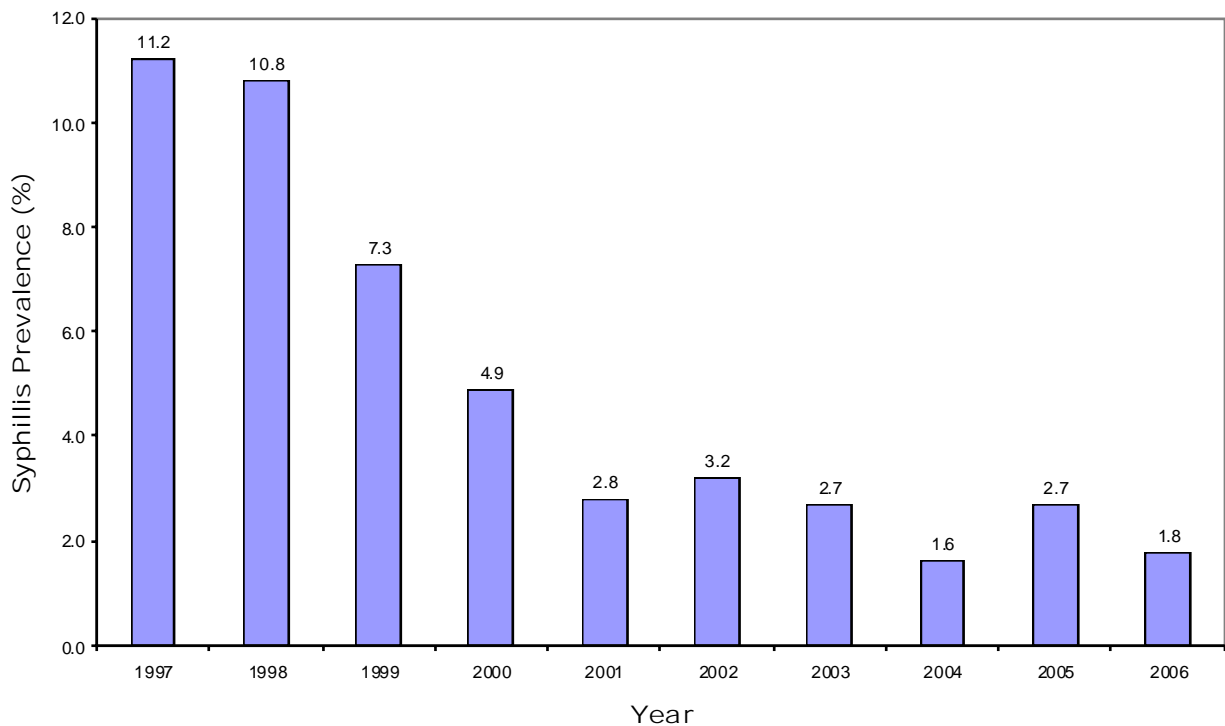
**Figure 5: HIV Prevalence among antenatal clinic attendees in South Africa by District, 2006**

### 3.3 Syphilis prevalence

#### 3.3.1 National syphilis prevalence

This study found that 1.8% of pregnant women presenting at public antenatal care clinics had syphilis infection. This is lower than the 2.7% prevalence recorded for 2005.

Figure 6 shows the trend of syphilis prevalence among attendees of antenatal clinic from 1997 to 2006.



**Figure 6: National Syphilis Prevalence among antenatal clinic attendees in South Africa: 1997-2006**

### 3.3.2 Syphilis prevalence by province

Table 5 below shows syphilis prevalence trends by province. In general 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. Limpopo shows the lowest rate at 0.6%.

**Table 5: Syphilis prevalence by province among antenatal clinic attendees, South Africa 2004 - 2006**

Province	RPR prev. 95% CI 2004	RPR prev. 95% CI 2005	RPR prev. 95% CI 2006
Northern Cape	7.0 (3.8 - 10.3)	8.5 (6.1 - 10.8)	6.9 (5.0 - 8.9)
Gauteng	0.9 (0.5 - 1.3)	4.3 (3.5 - 5.1)	2.3 (1.9 - 2.7)
Western Cape	1.6 (0.9 - 2.3)	4.0 (3.1 - 4.9)	1.9 (1.4 - 2.4)
Free State	3.8 (2.9 - 4.8)	3.0 (2.0 - 4.0)	2.5 (1.8 - 3.1)
Mpumalanga	1.3 (0.5 - 2.0)	2.9 (1.6 - 4.2)	1.1 (0.7 - 1.5)
Eastern Cape	2.4 (1.5 - 3.3)	2.5 (1.9 - 3.1)	2.6 (2.0 - 3.1)
North West	2.1 (1.1 - 3.1)	1.9 (1.2 - 2.6)	1.8 (1.2 - 2.4)
KwaZulu-Natal	0.8 (0.5 - 1.1)	1.2 (0.7 - 1.6)	1.0 (0.8 - 1.4)
Limpopo	0.9 (0.4 - 1.4)	1.1 (0.6 - 1.5)	0.6 (0.4 - 0.9)
<b>National</b>	<b>1.6 (1.3 - 1.8)</b>	<b>2.7 (2.5 - 3.0)</b>	<b>1.8 (1.7 - 2.0)</b>

**N.B.** The true value is estimated to fall within the two confidence limits, thus the Confidence interval (CI) is important to refer to when interpreting data