



**DEPARTMENT OF HEALTH**  
*Republic of South Africa*

**SUMMARY REPORT**

**NATIONAL HIV AND SYPHILIS  
ANTENATAL SERO-PREVALENCE  
SURVEY  
IN SOUTH AFRICA  
2002**

AIDS HELPLINE: 0800 01 23 22

Directorate: Health Systems Research,  
Research Coordination and Epidemiology



# **NATIONAL HIV AND SYPHILIS ANTENATAL SERO-PREVALENCE SURVEY IN SOUTH AFRICA 2002**

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## **PREFACE**

HIV/AIDS continues to be one of the biggest challenges faced by South Africa today, alongside poverty, joblessness and other social ills that the government is trying hard to eradicate. In 2001, it was estimated that 4.7 million South Africans were living with HIV and AIDS, of whom 189 000 were babies. However, all of us remain affected. The challenges of preventing new infections, providing treatment to the infected and care to those who are in need of our compassion remain. The past few months have highlighted the intrinsic link between HIV and poverty as we know while breadwinners and other family members become affected, families have to increasingly strive with limited resources to provide medical care whilst at the same time compromising their access to food, shelter and clothing.

This report is the 13<sup>th</sup> in a series of studies on HIV and syphilis prevalence conducted among pregnant women attending antenatal care in the public sector. The findings show that while we continue to see a stabilisation in the HIV prevalence rates, and are encouraged by the continuing declines in syphilis, HIV and STI's such as syphilis remain causes for concern and demand more attention and intervention from all of us.

Women are harder hit in Africa than men. The difference between men and women in terms of susceptibility is pronounced, with women more likely to acquire HIV infection from an infected partner and also more vulnerable due to unequal gender relations. Therefore it is important that as we plan our interventions we take cognisance of both the sex and gender issues that make women more vulnerable. Clearly these are not only challenges for the health sector, but for society at large. Increased inter-sectoral involvement and collaboration will ensure success in these challenges that we face.

**MINISTER: HEALTH**

**DR EM TSHABALALA-MSIMANG**

**DATE:**



## ACKNOWLEDGEMENTS

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Finally, I would like to thank all the service providers at all participating sites and the antenatal clinic attendees who participated in the survey, without whom the survey would not have been possible.

**DIRECTOR-GENERAL: HEALTH**

**DR AYANDA NTSALUBA**

**DATE:**



## 1. INTRODUCTION

National sentinel surveys of public sector antenatal clinic attendees have been conducted in South Africa by the Department of Health since 1990. Antenatal sentinel surveys are internationally recognised as tools for estimating the magnitude, growth and spread of the epidemic over time. These surveys conducted each year, have provided the best available data in terms of HIV and syphilis prevalence and are regarded as the cornerstone in tracking the progression of the HIV/AIDS epidemic in the country. These surveys are carried out every year during the month of October. Pregnant women presenting for antenatal care for the first time during the current pregnancy at selected sites are requested to participate in this anonymous and unlinked survey. The survey findings are instrumental in informing policy and programme interventions aimed at preventing new infections and mitigating the effects of the epidemic. Some of these interventions include improvements in the syndromic approach to the management of sexually transmitted infections (STIs), improved management of opportunistic infections among people infected with HIV, expansion of prevention of mother-to-child transmission (PMTCT) of HIV, and other initiatives.

Since the beginning of the epidemic, an estimated 60 million people worldwide have become infected with the HI virus, with an estimated 40 million people living with HIV at the end of 2001. UNAIDS further estimated that 3.4 million new HIV infections occurred in sub-Saharan Africa in the past year (2001), which means that 28.1 million Africans now live with the virus. Recent antenatal clinic data show that several parts of Southern Africa have now joined Botswana with prevalence rates among pregnant women exceeding 30%. However, HIV prevalence among adults continues to fall in Uganda, while there is evidence that prevalence among young people (especially women) is dropping in some parts of the continent. South Africa while regarded as having one of the highest HIV prevalence rates in the world with an estimated 4.7 million South Africans living with HIV/AIDS; prevalence among young women (below 20 years) is also dropping.

In the process of extending Voluntary Counselling and Testing (VCT) services and surveillance for HIV in the general population, the Department of Health uses a model based on the results of the survey to estimate the impact of HIV in the general population.



The 13<sup>th</sup> in this series of antenatal surveys was conducted during October 2002. The results are here below presented.

## **2. OBJECTIVES OF THE SURVEY**

The objectives of the 2002 survey were to:

- Determine an estimate of HIV and syphilis prevalence among pregnant women attending public sector antenatal clinics and
- Describe HIV and syphilis trends in terms of time, place (province) and age among pregnant women.

## **3. METHODOLOGY**

### **3.1 Study Design**

An anonymous, unlinked survey was conducted among pregnant women attending antenatal care at selected participating sites in all nine provinces in the country. The survey was conducted from the 1<sup>st</sup> to the 31<sup>st</sup> October 2002. All pregnant women attending antenatal care for the first time during the current pregnancy were eligible for inclusion in the survey.

### **3.2 Sampling Methodology**

A two-stage random cluster sample using the probability proportional to size (PPS) method was used. Each selected clinic/site was the primary sampling unit (PSU). This means that in each province, all first time antenatal clinic attendees have an equal chance of being selected for the study.

### **3.3 Study Administration**

In early August 2002 prior to the start of the survey, the National Department of Health Cluster: Health Information, Evaluation & Research (HIER) hosted a preparatory workshop for all provincial survey and laboratory coordinators.





The purpose of this workshop was:

- To clarify the roles and responsibilities for each participating province and laboratory
- To revisit the study protocol, study administration methods and procedures
- To clarify and resolve any outstanding issues regarding the logistics, the administration and the procedural audit of the survey.

Subsequent to the workshop all provinces in conjunction with the Health Systems Research, Research Coordination and Epidemiology directorate conducted training workshops for the survey. These workshops were attended by health providers including; regional and district managers, communicable disease coordinators, health information officers, clinic supervisors, clinic staff, *etc.* At these workshops all participants were introduced to the survey's standard operating procedures: logistics, transportation of specimens and overall administration of the survey.

The Provincial Coordinators' roles included making arrangements for the survey equipment (5ml vacutainers with SST gel and clot activator, paired barcode labels, data capture sheets, cooler boxes and ice bricks where required) to be delivered to the participating sites. The national laboratory coordinator was responsible for overseeing the proper storage and transport arrangements for the specimens in the provinces. The existing NHLS network of couriers was used in all provinces except in KwaZulu-Natal, Limpopo, North West and parts of the Eastern Cape and the Free State where private courier services were employed.

Laboratory coordinators also attended the preparatory workshop. Their role was to ensure the effective running of the survey with regard to testing for both syphilis and HIV, weekly report-back on the progress of the survey to the National Coordinator (to ensure that any problems in the field such as haemolysed specimens, transport problems, sites not sending specimens, *etc.*) were attended to timeously during the course of the survey, to monitor internal quality control and the preliminary entry of results. The laboratory coordinators were also responsible for sending the data capture sheets with the results and the preliminary electronic data to the provincial coordinator where the second data entry and checking took place. The coordinators were also tasked with ensuring proper storage and transportation of all HIV positive sera to the University of Natal for incidence testing.



The national coordinating office (Epidemiology Directorate) was responsible for the overall coordination of the survey, the procedural audit and support visits to the sites (this was done during the course of the survey), collation of the provincial data, data cleaning, analysis and the preparation of this report.

### **3.4 Field Logistics**

The transportation of specimens from participating sites to the laboratory was a critical element to the success of the survey. The national coordinating team addressed transport and other logistical problems during the support visits to the provinces and sites. Sites in deep rural areas were encouraged to send the blood to the nearest hospital laboratory (where possible) for centrifuging to ensure that specimens arrived at the testing laboratory in good condition.

### **3.5 Sentinel population**

The study population comprised pregnant women. These were women attending antenatal care for the first time during the current pregnancy in October 2002 at a participating site.

In the public sector, all first time antenatal clinic attendees have blood drawn for RPR testing and other routine purposes. During a routine slot on health education and promotion for these mothers-to-be, they are informed of the importance of testing for syphilis, hypertension and other routine tests.

In October, staff at participating clinics are requested to utilise the same slot to inform women about the survey and request their participation. It is impressed upon the women that the survey is anonymous and unlinked as no identifiers such as name, identity number, and address are taken. Women who choose to participate in the survey and would further like to know their HIV status, are referred for VCT either within the site (where the service exists) or to the nearest VCT site. Further, in the case where the clinic is a PMTCT site, women are given the opportunity to participate in the Nevirapine pilot should they be HIV positive. After the routine blood sample has been drawn, a second vacutainer of blood is taken from every participating woman. This blood sample is labelled with a barcode label, at the same time demographic data such as age, race, education, parity, etc. are completed on a data capture sheet, which is labelled with a second barcode label with the same number. The specimen and data capture sheet are sent



via courier to the participating laboratory in the province. In 2002, a total of 16 587 women participated in the survey.

### **3.6 Sampling sites**

A total of 396 sentinel sites participated in the survey in 2002.

### **3.7 Laboratory testing**

For HIV testing, all specimens were tested with one ELISA except in the Western Cape province. In this province due to the low HIV prevalence (below 10%), two ELISA tests were used. Any serum that was reactive on the first assay was retested with a second ELISA test, which was based on a different antigen preparation or a different test principle. Serum that was non-reactive on the first test was considered HIV negative and was not retested. All specimens were also screened for syphilis using the RPR test. All HIV positive specimens were stored for HIV incidence testing.

### **3.8 Quality Assurance**

The National Institute for Communicable Diseases (NICD) was responsible for the external quality control of the HIV prevalence testing. All participating laboratories were sent a panel of 20 specimens (HIV positive, negative and borderline) prior to the survey and were required to test and submit the results to the NICD.

MEDUNSA was responsible for the external quality control for syphilis testing. A panel of 20 specimens was sent to all participating laboratories and they were required to test and submit the results back to MEDUNSA.

### **3.9 Data Processing and Analysis**

All participating laboratories did the initial data entry. All laboratories transferred the data into an Excel spreadsheet, which together with the original data capture forms, were sent to all Provincial Coordinators for second data entry and checking in EPI-INFO6. The data was then sent to the national office where it was re-checked and then analysed in both SPSS and STATA.

### **3.10 Study limitations**

An attempt is made to include all the clinics selected for inclusion into the study using the probability proportional to size (PPS) method for sampling. Over time- though not often-



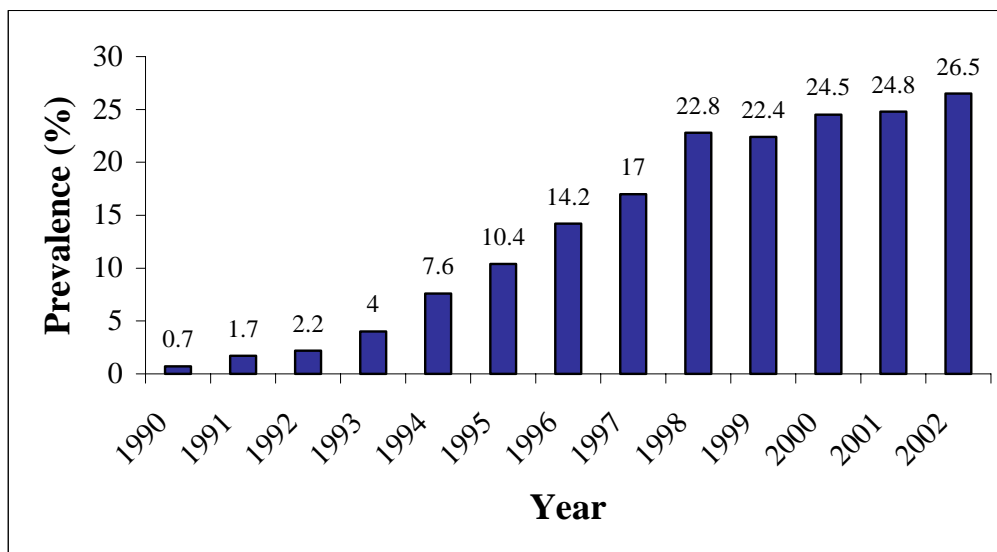
some chosen sites stop providing antenatal care services, or for a variety of reasons no longer function in such a way that they can be relevant for the antenatal survey. In these instances logistical considerations cause the study team to replace (a systematic mechanism to do this is followed) a formerly participating clinic. A second limitation of the study is that the use of public sector health care facilities excludes women who opt to utilise private health care facilities.

#### 4. RESULTS

##### 4.1 HIV Prevalence

###### 4.1.1 National HIV prevalence

Based on the antenatal survey conducted in October 2002, 26.5% of pregnant women were HIV positive in 2002. Although this estimate is higher than the 24.8% prevalence (lower confidence interval 23.6% and upper CI 26.1%) recorded in 2001, the increase is not statistically significant. The higher confidence interval of 27.6% in 2002 does however suggest a marginal increase in the estimate.



**Figure 1 HIV Prevalence trends among antenatal clinic attendees in South Africa: 1990-2002**

###### 4.1.2 HIV Prevalence by province

In 2002 the province that recorded the highest HIV prevalence rate among antenatal clinic attendees is KwaZulu-Natal with a rate of 36.5%. This is more than the 33.5% recorded in 2001. The province that had the second highest HIV prevalence rate among pregnant



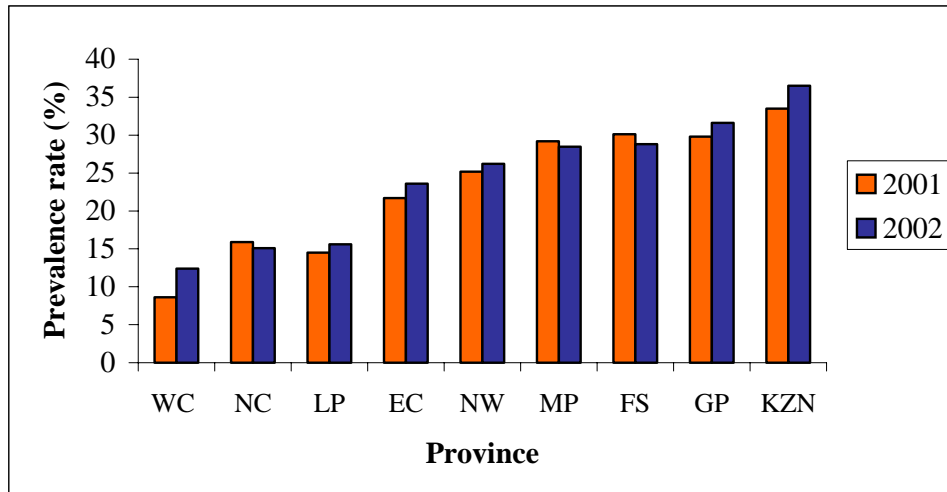
women in 2002 is Gauteng (31.6%), followed by Free State (28.8%), Mpumalanga (28.6%), North West (26.2%), Eastern Cape (23.6), Limpopo (15.6%), Northern Cape (15.1%) and lastly Western Cape (12.4%).

The increases observed in KwaZulu-Natal, Gauteng, North West, Eastern Cape, and Limpopo were not statistically significant and the confidence intervals are in the same range as in 2001. The decreases in Free State, Mpumalanga and Northern Cape were also not statistically significant. The increase in the Western Cape was statistically not significant and the confidence intervals are overlapping. This difference although real, could be due to sampling variations and should be monitored over the coming years.

**Table 1: HIV prevalence by province among antenatal clinic attendees, South Africa 2000-2002**

<b>PROVINCE</b>	<b>ESTIMATED HIV + 95% CI 2000</b>	<b>ESTIMATED HIV + 95% CI 2001</b>	<b>ESTIMATED HIV + 95% CI 2002</b>
KwaZulu-Natal	36.2 (33.4-39.0)	33.5 (30.6-36.4)	36.5 (33.8-39.2)
Gauteng	29.4 (27.2-31.5)	29.8 (27.5-32.1)	31.6 (29.7-33.6)
Free State	27.9 (24.6-31.3)	30.1 (26.5-33.7)	28.8 (26.3-31.2)
Mpumalanga	29.7 (25.9-33.6)	29.2 (25.6-32.8)	28.6 (25.3-31.8)
North West	22.9 (20.1-25.7)	25.2 (21.9-28.6)	26.2 (23.1-29.4)
Eastern Cape	20.2 (17.2-23.1)	21.7 (19.0-24.4)	23.6 (21.1-26.1)
Limpopo	13.2 (11.7-14.8)	14.5 (12.2-16.9)	15.6 (13.2-17.9)
Northern Cape	11.2 (8.5-13.8)	15.9 (10.1-21.6)	15.1 (11.7-18.6)
Western Cape	8.7 (6.0-11.4)	8.6 (5.8-11.5)	12.4 (8.8-15.9)
<b>National</b>	<b>24.5 (23.4-25.6)</b>	<b>24.8 (23.6-26.1)</b>	<b>26.5 (25.5-27.6)</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 ANC attendees in South Africa: 2001 & 2002**

#### **4.1.3 HIV Prevalence by age group**

Women aged between 25 and 29 years continue to be the most affected by HIV infection, with an estimated 34.5% of pregnant women in this age group being HIV positive. Women in the age group 30-34 years follow with a 29.5% prevalence rate, and those aged 20-24 years (29.1%). These three age groups recorded rates above 20%, while the rest of the age groups recorded prevalence rates below. These rates are as follows: 35-39 years (19.8%), 40+ years (17.2%) and < 20 years (14.8%).

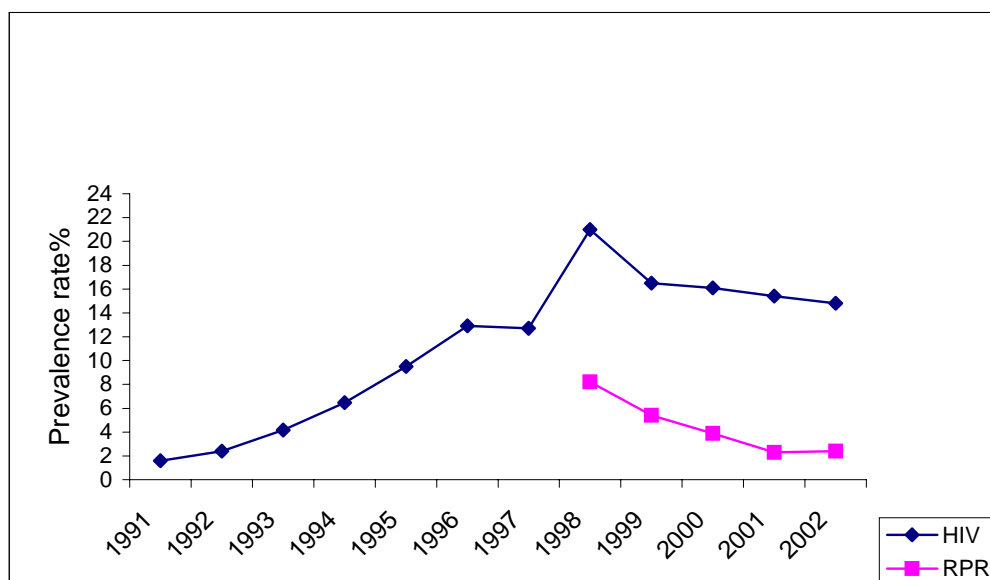
The increases in HIV prevalence between 2001 and 2002 in the age groups 25-29 years (p 0.033) and 30-34 years (p 0.021) were statistically significant. The increase in the age group 40+ was statistically very significant (p 0.002). The prevalence rates observed between 2001 and 2002 in the <20 year age group is an indication of a continued stabilisation in this age group.



**Table 3: HIV Prevalence by age group among ANC attendees in South Africa: 2000-2002**

AGE GROUP	ESTIMATED HIV	ESTIMATED HIV	ESTIMATED HIV
	+ 95% CI	+ 95% CI	+ 95% CI
	2000	2001	2002
< 20	16.1 (14.5-17.7)	15.4 (13.8-16.9)	14.8 (13.4-16.1)
20-24	29.1 (27.4-30.8)	28.4 (26.5-30.2)	29.1 (27.5-30.6)
25-29	30.6 (28.8-32.4)	31.4 (29.5-33.3)	34.5 (32.6-36.4)
30-34	23.3 (21.5-25.1)	25.6 (23.5-27.7)	29.5 (27.4-31.6)
35-39	15.8 (13.9-17.7)	19.3 (17.0-21.5)	19.8 (17.5-22.0)
40+	11.0 (7.9-14.2)	9.8 (7.0-12.6)	17.2 (13.5-20.9)

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.



Note: RPR trends by age are shown for when these data became available

**Figure 3 HIV and syphilis prevalence among ANC attendees aged below 20 years in South Africa: 1991-2002**

## 4.2 Syphilis Prevalence

### 4.2.1 National Syphilis Prevalence

The results of the survey conducted in October 2002 indicate that an estimated 3.2% of pregnant women attending antenatal care in the public sector had active syphilis. This is higher than the estimate of 2.8% in 2001.



#### 4.2.2 Syphilis prevalence by province

The province with the highest syphilis rate in 2002 is Gauteng with an estimated 6.0% of pregnant women testing positive. The Northern Cape and Free State provinces followed with rates of 5.2 and 5.0% respectively. The rest of the provinces recorded rates below 3.5%, with KwaZulu-Natal recording the lowest rate at 1.5%.

Table 3 below shows syphilis rates by province in 2002 compared to 2001 and 2000.

**Table 3: Syphilis prevalence by province among antenatal clinic attendees, South Africa 2000-2002**

PROVINCE	ESTIMATED RPR + 95% CI 2000	ESTIMATED RPR + 95% CI 2001	ESTIMATED RPR + 95% CI 2002
<b>Gauteng</b>	9.6 (8.2-11.0)	2.7 (2.0-3.3)	6.0 (5.0-7.1)
<b>Northern Cape</b>	5.1 (3.1-7.1)	6.2 (4.0-8.5)	5.2 (2.5-7.9)
<b>Free State</b>	4.8 (3.6-6.0)	2.0 (1.1-2.9)	5.0 (3.6-6.4)
<b>North West</b>	3.6 (2.1-5.2)	4.0 (2.8-5.2)	3.2 (2.0-4.5)
<b>Eastern Cape</b>	3.3 (2.5-4.1)	3.3 (2.4-4.2)	3.1 (2.1-4.1)
<b>Mpumalanga</b>	3.7 (2.4-5.0)	2.0 (1.3-2.7)	2.5 (1.6-3.4)
<b>Western Cape</b>	5.2 (4.3-6.1)	2.9 (2.1-3.7)	2.0 (1.2-2.9)
<b>Limpopo</b>	4.2 (3.2-5.2)	4.9 (3.6-6.2)	1.9 (1.3-2.6)
<b>KwaZulu-Natal</b>	2.6 (1.6-3.7)	1.3 (0.9-1.7)	1.5 (1.0-1.9)
<b>National</b>	4.9	2.8	3.2 (2.9-3.6)

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.

#### 4.2.3 Syphilis prevalence by age group

The highest syphilis prevalence rate in 2002 was recorded among women aged 24-29 years (3.7%). As with HIV prevalence among women aged below 20 years, syphilis rates show a decline over the past four years (Figure 3 and Table 4).





**Table 4: Syphilis Prevalence by age group among ANC attendees in South Africa: 2000-2002**

<b>AGE GROUP</b>	<b>ESTIMATED RPR + 95% CI 2000</b>	<b>ESTIMATED RPR + 95% CI 2001</b>	<b>ESTIMATED RPR + 95% CI 2002</b>
<b>&lt; 20</b>	3.9 (3.2-4.7)	2.3 (1.8-2.9)	2.4 (1.8-3.0)
<b>20-24</b>	4.9 (4.2-5.6)	3.1 (2.6-3.6)	3.5 (3.0-4.1)
<b>25-29</b>	5.4 (4.5-6.2)	3.0 (2.4-3.6)	3.7 (3.1-4.4)
<b>30-34</b>	4.5 (3.5-5.5)	3.1 (2.4-3.8)	3.2 (2.5-4.0)
<b>35-39</b>	4.4 (3.2-5.5)	2.3 (1.6-3.1)	2.8 (1.9-3.7)
<b>40+</b>	4.9 (2.7-7.1)	1.8 (0.6-3.1)	1.3 (0.25-2.3)

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.

### **4.3 Extrapolation of HIV prevalence to the general population**

Based on results of the 2002 antenatal survey, using a model developed by the Department of Health; an estimated 5.3 million South Africans were HIV positive by the end of 2002 (See Appendix 1). This is more than the 4.74 million estimate for 2001.

On the basis of this model, it is estimated that in 2002 2.95 million women between the ages of 15 to 49 years and 2.3 million men between 15 and 49 years were infected with HIV. It is estimated that 91 271 babies became infected with HIV through the mother-to-child transmission route.



## 5. DISCUSSION AND CONCLUSION

The results of the 2002 antenatal survey among pregnant women show that HIV and STI's continue to be significant public health problems in South Africa. The number of individuals infected with HIV continues to be a cause for concern.

When the prevalence rates are examined on a year on year basis, in other words comparing 2001 and 2002 prevalence rates, the observed increase does not raise concern from the perspective of escalation of the epidemic. It is expected during a stabilisation phase that there may be minor spiking. Overall, the rate of increase between the two years is very low. It is particularly encouraging to observe what may be the beginnings of a decline in HIV rates among women aged below 20 years. This group is considered the most important to watch with respect to new infections taking place. The increases observed among other age groups need closer examination but may suggest a cohort effect, or less ability/ empowerment for women in these age groups to respond to prevention messages.

In terms of provincial comparisons, KwaZulu-Natal is still the province with the highest HIV prevalence rate among pregnant women and has shown an increase between 2001 and 2002. Western Cape province has for the first time since the beginning of the antenatal surveys, recorded a prevalence rate above 10%. Two provinces, namely Free State and Northern Cape have shown slight declines in HIV prevalence between 2001 and 2002, whilst Mpumalanga shows a decline between 2000 and 2002. All other provinces are showing increases in HIV prevalence between 2001 and 2002. The reasons for this may be difficult to decipher as the survey gives an indication of existing infections and not new infections (incidence).

Syphilis prevalence at 3.2% is higher than last year's (2001) estimate of 2.8%. As with HIV, it is important to target women with age-appropriate messages aimed at reducing their chances of contracting STI's and HIV.

In conclusion, the findings of the 2002 survey indicate that an estimated 5.3 million people are infected with HIV in South Africa. The full participation of all sectors of society and the strengthened intersectoral involvement in implementing the HIV/AIDS and STI strategic initiatives will be critical to an effective national programme. Also



critical is the strengthening of Information, Education and Communication (IEC) strategies and campaigns among older women and men, particularly as they may be in stable relationships, which they may perceive to place them at lesser risk of HIV and other sexually transmitted infections.

The HIV and syphilis survey continues to be a source of critical information in the fight against HIV and AIDS. The behavioural surveillance study to be conducted in 2003 will shed more light into elements of behaviour placing people at higher risks of HIV and STI infection and will also give information on how protective behaviours can be encouraged among people.



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## Appendix 1:

### Estimated number of people infected with HIV in South Africa

The extrapolation of the results found in the antenatal clinic attendees to the total population were made based on the following assumptions:

Assumption 1: The prevalence rate of HIV infection in all pregnant women in South Africa is the same as the prevalence rate in women attending public antenatal clinics.

Assumption 2: The prevalence rate of HIV infection in all women aged 15 to 49 years is the same as the prevalence rate in pregnant women

Assumption 3: Estimate of males infected= 85% of infected females

Assumption 4: The mother- to-child transmission rate= 30%

### Estimated number of people infected with HIV in South Africa in 2002

Age Group	15-19	20-24	25-29	30-34	35-39	40+	Total
<b>Estimated Female Population</b>							
	2385012	2132045	2073425	1777153	1602721	2459411	2429766
<b>Age-specific HIV prevalence among pregnant women (%)</b>							
Low estimate	13.4	27.5	32.6	27.4	17.5	13.5	
Best estimate	14.8	29.1	34.5	29.5	19.8	17.2	
High estimate	16.1	30.8	36.4	31.6	22.0	20.9	
<b>Estimated number of females infected in South Africa in 2002</b>							
Low estimate	318876	586739	676766	486229	280957	333004	2549218
Best estimate	351789	619572	715746	523727	316858	423019	2883804
High estimate	384702	652193	754519	561225	352759	513279	3217860
<b>Estimated number of births that occurred in South Africa in 2002</b>							
	181261	296354	296500	193710	118601	49396	1135823
<b>Estimated number of babies infected from pregnant women in 2002</b>							
Low estimate	7270	24467	29033	15900	6237	2006	84914
Best estimate	8021	25836	30705	17126	7034	2549	91271
High estimate	8771	27196	32368	18352	7831	3093	97613
<b>Estimated number of HIV infected persons by the end of 2002</b>							
	<b>Females (age 15-49)</b>		<b>Males (age 15-49)</b>		<b>Babies</b>		<b>Total</b>
Low Estimate	2682571		2099467		84914		4866952
Best Estimate	2950711		2307952		91271		<b>5349935</b>
High Estimate	3218677		2514247		97613		5830536