

DEPARTMENT: HEALTH  
*Republic of South Africa*



**SUMMARY REPORT**

**NATIONAL HIV AND SYPHILIS  
SERO-PREVALENCE SURVEY OF  
WOMEN ATTENDING PUBLIC  
ANTENATAL CLINICS IN  
SOUTH AFRICA**

**2001**

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## **PREAMBLE**

This report is the 12<sup>th</sup> in a series of national antenatal surveys designed to track the magnitude of the HIV epidemic in South Africa. The results of this survey indicate that South Africa, like most of the African region is still confronted with a major health problem with vast social, economic and development implications.

The antenatal survey findings over the last several years along with data obtained on STI prevalence further support trends and patterns observed in recent years: that the pace at which the HIV epidemic was growing between 1990-1998 has slowed down and has begun to level off. Intervention programmes seem to be effectively taking ground amongst teenagers where we have seen an encouraging decrease in HIV prevalence between 2000-2001.

The findings of this report provide renewed optimism in what has become one of the greatest challenges our country has ever faced. They place us in a better position to tackle the challenges of care and support while sustaining the momentum in prevention activities. The initiatives in treatment, care, support and prevention against HIV/AIDS, TB, STIs and other opportunistic infections by different role-players is well appreciated.

Whilst we acknowledge the contribution of all in responding to prevention and intervention activities to combat the HIV/AIDS epidemic, it is the responsibility of all South Africans in all sectors and walks of life to participate actively in the fight against HIV/AIDS. Social mobilisation and intersectoral collaboration will ensure that our interventions also translate in decreased mortality and morbidity due to HIV/AIDS.

The emerging trends mark the beginning in successes in the fight against HIV/AIDS. South Africa has positioned itself to be effective in this endeavour and is committed in partnership with its National and International initiatives to combat HIV/AIDS, STI and TB, and thus reach its social and economic development targets.

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## **1. INTRODUCTION**

HIV/AIDS is currently one of the most devastating health conditions affecting the health of millions throughout the world. UNAIDS estimates that approximately 60 million people have been infected since the beginning of the epidemic and in 2001 alone an estimated 5 million would have acquired HIV infection<sup>1</sup>. A significant proportion of these individuals reside in Sub Saharan Africa.

The health and social implications of HIV/AIDS on human development are extensive<sup>2</sup> and have resulted in an expanded national and international effort to respond to the HIV/AIDS epidemic with increased funding and expansion of prevention, care and intervention activities. Notable initiatives include the Global Fund against HIV/AIDS, TB and Malaria, and The New Partnership for Africa's Development (NEPAD) programme. In South Africa activities have expanded and funding of HIV/AIDS has increased significantly from the 2001/2 to the 2002/3 financial year.

Effective monitoring and surveillance of the HIV/AIDS epidemic is an essential component of a dynamic and effective national programme. National and even global estimates of HIV infection are limited by relatively weak monitoring systems. In many countries monitoring systems are not designed to give a representative sample of the total population and in countries with large populations, where one province or state would have the population of a country such as South Africa, the prevalence estimates from sentinel sites could all but lose meaning<sup>1</sup>.

In South Africa the Department of Health (DOH) instituted a mechanism to annually monitor the HIV epidemic since 1990<sup>3</sup>. This surveillance system was reviewed, and the sampling design modified to give nationally representative estimates of HIV prevalence. A more comprehensive understanding of the epidemiology of HIV/AIDS will be possible with information obtained from the Department's expanded second generation surveillance programme which will indicate new infection rates as well as associated behavioural factors<sup>4</sup>.

This report presents highlights of the 2001 antenatal survey conducted in the 9 provinces of South Africa.

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

The primary objectives of the 2001 survey were:

- To estimate HIV prevalence in South Africa in 2001 and present trends in HIV prevalence from 1990 to 2001 among pregnant women
- To describe HIV trends in 2001 by age group and province and present age and province specific trends from 1990 to 2001
- To make estimates (on the basis of the DOH model) of the number of men, women and infants in the general population who were infected with HIV by the end of 2001.

The secondary objective of the 2001 study was:

- To estimate syphilis prevalence among women in 2001 and track trends in syphilis prevalence from 1997 to 2001.

## **3. SURVEY METHODOLOGY**

### **3.1 Study design**

This survey was conducted concurrently across all nine provinces from the 1<sup>st</sup> to 31<sup>st</sup> October 2001. The study was an anonymous, unlinked, cross-sectional survey<sup>6</sup>. The study population included pregnant women who attend antenatal clinics in the public health sector of South Africa.

### **3.2 Study administration**

A national workshop of provincial co-ordinators was held to review the protocol, review study methods, plan field logistics review standard operating procedures, and review field logistics, (e.g. Provision of 5 ml Vacutainers with SST gel and clot activator, paired bar-code labels, and data capture sheets). It also prepared the team for data analysis and processing procedures.

Participating laboratories and courier services were prepared to ensure that appropriate testing procedures would be adhered to and blood specimens safely and timely transported from each antenatal clinic to testing laboratories.

The national departments co-ordinating office ensured the overall co-ordination of the survey including support visits to the nine provinces, conducting the procedural audit of the survey countrywide, re-processing provincial estimates, processing of the national data set, modelling further HIV estimates and compiling a singular national report. The procedural audit included investigation into preparation of sentinel sites, logistics and adherence to the study protocol in general.

### **3.3 Quality Assurance**

In the course of this survey, careful laboratory and data management quality assurance was conducted. For each of the participating laboratories, the ELISA and RPR tests for HIV and syphilis testing were internally quality assured. The National Institute for Communicable Diseases (NICD) performed external quality control for the HIV testing and the Medical University of Southern Africa (MEDUNSA) Microbiology laboratory conducted quality control for the syphilis testing. Double data-capture was conducted on provincial data sets.

### **3.4 Sentinel population**

The sentinel population for the study includes pregnant women attending a public sector antenatal clinic for the first time during the current pregnancy. The choice of the first antenatal visit is made to minimise the chance for one woman attending two clinics and being included in the study more than once. The survey builds on routine screening for blood grouping, syphilis, and full blood count (FBC) that takes place during a woman's first antenatal visit.

### **3.5 Sampling methodology**

The probability proportional to size (PPS) sampling method was used to determine the sample size for the 2001 antenatal HIV survey<sup>6</sup>. The clinic formed the primary sampling unit in the sampling frame; this method is adopted to ensure a representative sample that is weighted for rural urban distribution. A total sample of 16 743 specimens was included in the survey.

Provinces with the biggest population sizes (of women in the reproductive age) yielded the biggest sample sizes, whereas those with smaller population sizes had smaller sample sizes. A total of 421 sentinel sites (clinics) participated in the 2001 survey. All sites were required to consider for inclusion in the sample the first forty antenatal attendees who qualify for inclusion in the study.

### **3.6 Inclusion criteria**

Consecutive first time antenatal clinic attendees from the 421 sentinel sites were included in the survey until the target of 40 specimens was reached or the 31<sup>st</sup> October, whichever came first. Women attending each of the participating clinics for the first time in the current pregnancy were eligible for inclusion in the study. Blood was taken as part of the routine screening done for pregnant women when they attend the clinic for their "*booking visit*".

As the survey is anonymous no personal identifiers (names, ID number, address, etc) are used on the blood sample of the participant. Instead bar-coded numbers are used to ensure anonymity of the participants, to facilitate laboratory procedures and minimise the chances of errors during the handling of the blood specimens.

### **3.7 Laboratory testing**

Laboratory testing was conducted in accordance with the national standardised survey protocol. Participating laboratories included the NHLS labs in Bloemfontein, Johannesburg, Kimberley, Nelspruit, Port Elizabeth as well as the Virology laboratories of the University of Natal-Durban and MEDUNSA. As already mentioned the NICD and MEDUNSA laboratory conducted quality controls.

#### **3.7.1 HIV testing**

The HIV testing methodology employed is the World Health Organisation (WHO) recommended procedure for antenatal surveys<sup>6</sup>. As required by that protocol blood specimens were tested with one ELISA (Abbot Axysm System for HIV-1/HIV-2) in all provinces except the Western Cape where two tests were performed. According to the WHO protocol low HIV prevalence as in the Western Cape province (less than 10%), requires that two ELISA tests be used. Sera found to be reactive on the first assay were retested with the second ELISA test, whereas those shown to be non-reactive on the first test were considered HIV antibody negative and therefore not retested. All positive HIV sera were stored for the pilot HIV incidence testing.

#### **3.7.2 Syphilis testing**

Syphilis testing was conducted using the RPR test. 16 701 specimen were tested and results for 42 specimen were excluded from RPR testing for quality reasons.

### **3.8 Data processing and analysis**

Data analysis was conducted using the STATA and SPSS software packages. Data entry was standardised using EPHINFO programme designed and piloted with the provinces during the planning session. Data analysis was conducted at both the provincial and national levels to verify analysis.



## 4. RESULTS

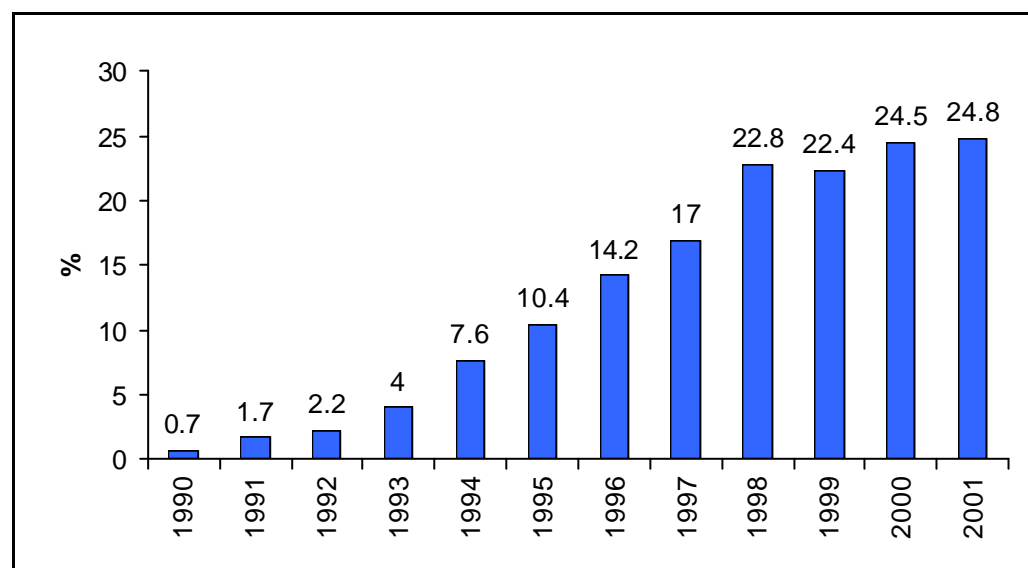
### 4.1 Total sample size

A total number of about 16 743 pregnant women participated in the survey (HIV results were not recorded for 13 specimens and therefore not included in the analysis, whilst 42 were excluded for RPR). Thus 16 730 specimen were tested for HIV and 16 701 were tested for syphilis.

### 4.2 HIV prevalence

#### 4.2.1 National HIV prevalence

Based on the 16 730 blood samples tested for HIV during the survey, it is estimated that nationally, 24.8% of pregnant women were infected with HIV by the end of 2001. This is in comparison with a prevalence rate of 24.5% in were not recorded for 2000. Whilst this rate of infection is high and a significant public health problem the findings indicate that there is not a statistically significant growth in the epidemic from the previous year. Figure 1 shows that the national prevalence rate of increase has slowed in its increase since 1998. This is referred to as a levelling off, plateau or stabilisation in growth.



**Figure 1 National HIV prevalence trends among antenatal clinic attendees in South Africa: 1990-2001**

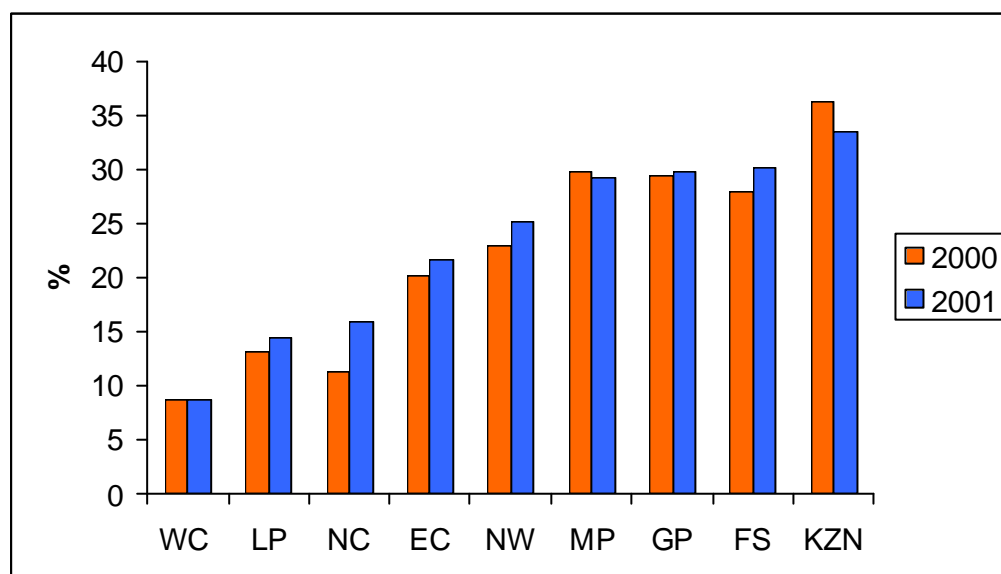
#### 4.2.2 Provincial HIV prevalence estimates

Provincial prevalence rates show the geographic variations in the HIV epidemic. Table 1 show the HIV rates over the last three years.

**Table 1: Provincial HIV prevalence estimates: Antenatal clinic attendees, South Africa 1999-2001**

PROVINCE	HIV pos. 95% CI 1999	HIV pos. 95% CI 2000	HIV pos. 95% CI 2001
<b>KwaZulu-Natal (KZN)</b>	32.5 (30.1–35.0)	36.2 (33.4–39.0)	33.5 (30.6–36.4)
<b>Mpumalanga (MP)</b>	27.3 (25.2–30.7)	29.7 (25.9–33.6)	29.2 (25.6–32.8)
<b>Gauteng (GP)</b>	23.9 (21.7–26.0)	29.4 (27.2–31.5)	29.8 (27.5–32.1)
<b>Free State (FS)</b>	27.9 (24.7–29.8)	27.9 (24.6–31.3)	30.1 (26.5–33.7)
<b>North West (NW)</b>	23.0 (19.7–26.3)	22.9 (20.1–25.7)	25.2 (21.9–28.6)
<b>Eastern Cape (EC)</b>	18.0 (14.9–21.1)	20.2 (17.2–23.1)	21.7 (19.0–24.4)
<b>Limpopo (LP)</b>	11.4 (9.1-13.5)	13.2 (11.7–14.8)	14.5 (12.2–16.9)
<b>Northern Cape (NC)</b>	10.1 (6.6-13.5)	11.2 (8.5–13.8)	15.9(10.1–21.6)
<b>Western Cape (WC)</b>	7.1 (4.4-9.9)	8.7 (6.0–11.4)	8.6 (5.8– 11.5)
<b>National</b>	<b>22.4 (21.3–23.6)</b>	<b>24.5 (23.4–25.6)</b>	<b>24.8 (23.6 – 26.1)</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, 2000-2001**

Figure 2 above shows HIV prevalence by province in 2000 and 2001. The trends reflect the HIV prevalence rates the provinces have reached. It is worth noting however that HIV prevalence decreased but not statistically significantly in KwaZulu-Natal between 2000 and 2001. HIV prevalence rates did not change significantly (statistically) in Mpumalanga, Gauteng and Western Cape provinces between 2000 and 2001. Provinces which had marginal increases (also not statistically significant) include Limpopo, Free State and the Eastern Cape provinces. There were however larger increases in the Northern Cape and North West Provinces; the increase in the Northern Cape was marginally significant statistically.

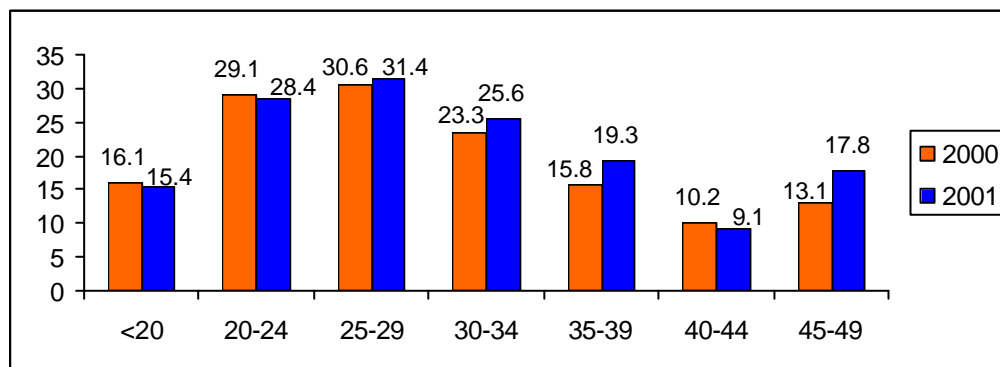
### 4.2.3 HIV point prevalence estimates by age group

There were different trends between young and older women. HIV prevalence among teenagers was estimated at 15.4%. This represents a decline in HIV prevalence between 2000 and 2001. However this is not statistically significant. HIV prevalence in the 20 to 29 year age group has not shown an increase from the previous year whilst there is a significant increase in HIV prevalence amongst women in the 30 to 39 year age category.

**Table 2: HIV prevalence trends by age group among antenatal clinic attendees in South Africa 1999-2001**

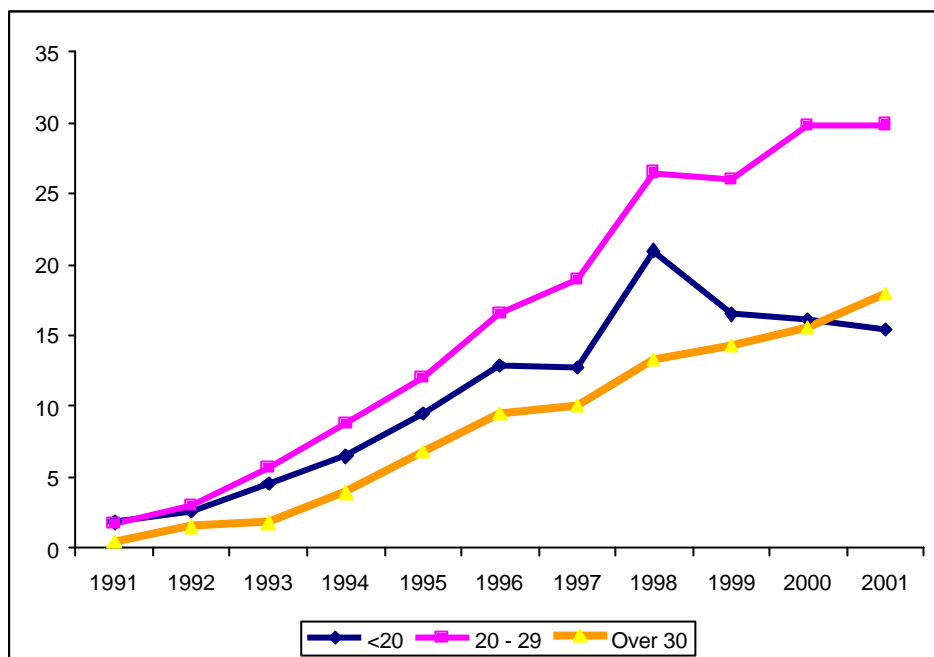
AGE GROUP	Est HIV+ (95%CI) 1999	Est HIV+ (95%CI) 2000	Est HIV+ (95%CI) 2001
<20	16.5 (14.9-18.1)	16.1 (14.5 –17.7)	15.4 (13.8 –16.9)
20-24	25.6 (24.0-27.3)	29.1 (27.4-30.8)	28.4 (26.5 –30.2)
25-29	26.4 (24.6-28.3)	30.6 (28.8-32.4)	31.4 (29.5 –33.3)
30-34	21.7 (19.1-23.8)	23.3 (21.5-25.1)	25.6 (23.5 –27.7)
35-39	16.2 (14.1-18.3)	15.8 (13.9-17.7)	19.3 (17.0 –21.5)
40-44*	12.0 (8.5- 15.6)	10.2 (6.9- 13.3)	9.1 (6.2 –11.9)
45-49*	7.5 (-.77-15.9)	13.1 (2.1-24.0)	17.8 (4.3 –31.4)

\*The true value could lie anywhere between the Confidence Intervals (CI)



N.B. The sample size for women in the 45 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 3 HIV prevalence by age group among antenatal clinic attendees in South Africa, 2000-2001**



**Figure 4 HIV Prevalence by Age, South Africa Antenatal Clinics. 1991 - 2001**

#### 4.2.4 Extrapolation of HIV infection to the population of South Africa

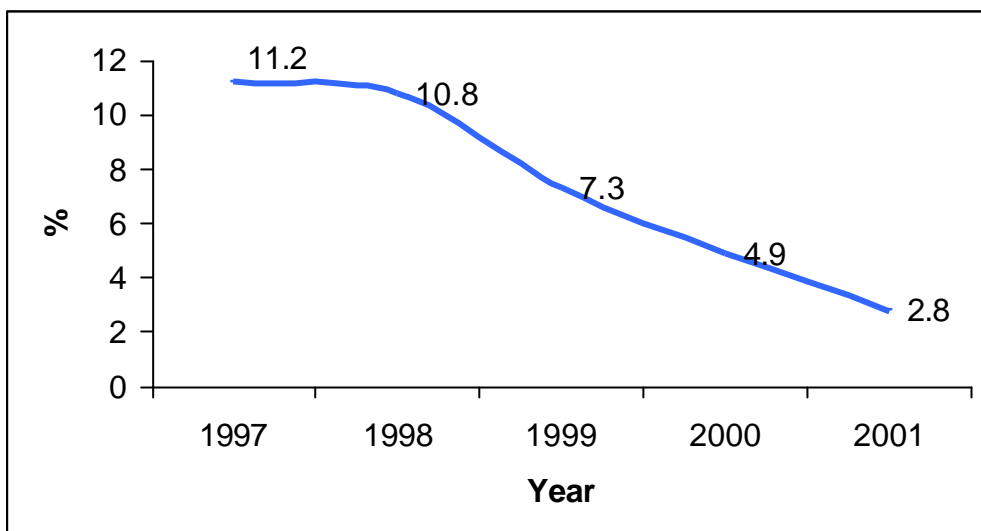
The Department of Health uses a model, which it developed to generate estimates of HIV infection in the general South African population. On the basis of this model, it is estimated that in 2001 2.65 million women between the ages of 15 to 49 were infected with HIV and 2,09 million men between 15 and 49 were infected with HIV. It is estimated that 83 581 babies became infected with HIV through the mother-to child transmission route.

It is estimated that by 2001 approximately 4.74 million people in South Africa had become infected with the HI virus. This is in comparison with 4.70 million who were infected by 2000.

### 4.3 Syphilis prevalence

#### 4.3.1 National syphilis prevalence

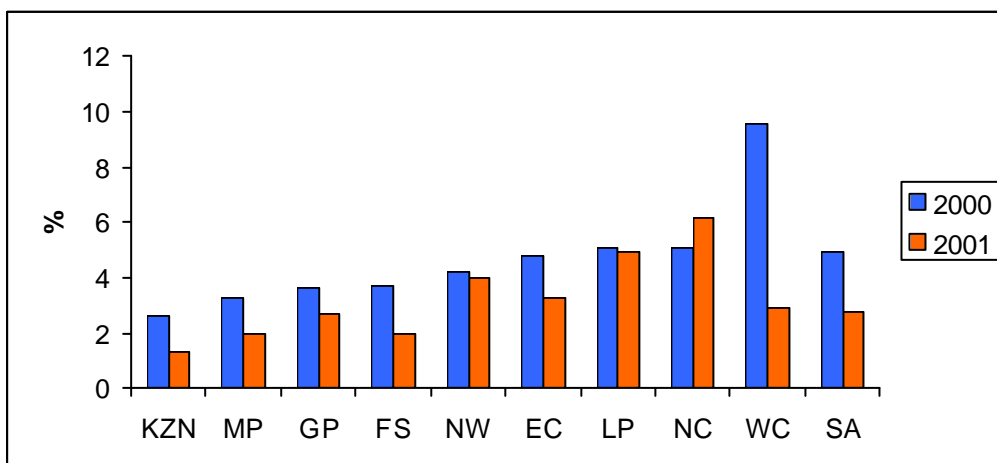
This study found that 2.8% of women who are pregnant and presenting at public maternal health facilities had syphilis infections. Though still a concern, this figure represents a decline from 4.9% in 2000. The syphilis prevalence trend is very notable as it has shown a constant decline over the last several years (Table 3 and Figure 5). Syphilis prevalence in the Northern Cape requires closer monitoring as the Northern Cape has shown a significant increase in syphilis prevalence between 2000 and 2001.



**Figure 5 National Syphilis Prevalence among antenatal clinic attendees in South Africa: 1997-2001**

**Table 3: Syphilis prevalence estimates among antenatal clinic attendees in South Africa, 1999-2001**

PROVINCE	RPR pos. 95% CI 1999	RPR pos. 95% CI 2000	RPR pos. 95% CI 2001
KwaZulu-Natal (KZN)	4.4 (3.5 - 5.4)	2.6 (1.6 - 3.7)	1.3 (0.9 - 1.7)
Mpumalanga (MP)	15.8 (13.5 - 18.0)	3.3 (2.5 - 4.1)	2.0 (1.3 - 2.7)
Gauteng (GP)	9.6 (8.3 - 10.9)	3.6 (2.1 - 5.2)	2.7 (2.0 - 3.3)
Free State (FS)	3.8 (3.1 - 4.5)	3.7 (2.4 - 5.0)	2.0 (1.1 - 2.9)
North West (NW)	9.1 (7.5 - 10.7)	4.2 (3.2 - 5.2)	4.0 (2.8 - 5.2)
Eastern Cape (EC)	3.8 (2.0 - 5.6)	4.8 (3.6 - 6.0)	3.3 (2.4 - 4.2)
Limpopo province (LP)	8.6 (6.8 - 10.5)	5.1 (4.3 - 6.1)	4.9 (3.6 - 6.2)
Northern Cape (NC)	5.6 (4.2 - 7.1)	5.1 (3.1 - 5.2)	6.2 (4.0 - 8.5)
Western Cape (WC)	4.4 (3.0 - 5.8)	9.6 (8.2 - 11.0)	2.9 (2.1 - 3.7)
National	7.30	4.90	2.80

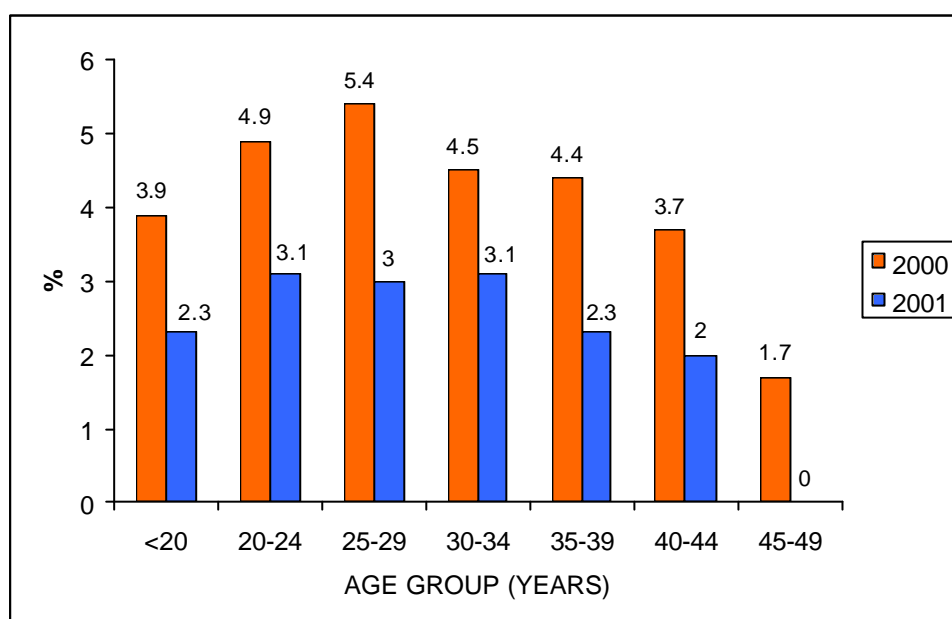


**Figure 6 Syphilis prevalence estimates among antenatal clinic attendees by province in South Africa, 2000-2001**

Provincial prevalence trends (see Figure 6) across the nine provinces show overall decline in syphilis trends with the exception of the Northern Cape between 2000 and 2001.

### 4.3.2 Syphilis point prevalence by age group

Figure 7 shows a decrease in prevalence between 2000 and 2001 in all age groups. The lowest syphilis prevalence rate in 2001 was noted among women aged 45-49 years.



**Figure 7 Syphilis prevalence trends by age group among antenatal clinic attendees in South Africa, 2000-2001**

## 5. DISCUSSION

The findings of the 2001 antenatal survey show that HIV/AIDS is a significant health problem in South Africa. It is estimated that 4.74 million individuals are now infected with the HI virus despite the intensive HIV prevention programmes that are in place. These high prevalence rates have significant implications on the future burden of HIV associated disease and the ability of the health system to cope with provision of adequate care and support facilities.

The most striking observations that can be made on HIV prevalence estimates however is that the prevalence of HIV though still high, has not increased between 2000 and 2001. These findings confirm the observation that the rapid growth of the South African epidemic may be slowing down<sup>8</sup>

Whilst HIV prevalence trends have their limitations as a marker of overall reduction in new HIV infections<sup>9</sup>, this slowing down factor is supported by what is emerging from syphilis trends and HIV trends in teenagers. Syphilis

infection is an important indicator of greater biological susceptibility to HIV infection and sometimes an indication of possible high-risk behaviour of the infected individual. The 2001 antenatal survey has shown an ongoing reduction in rates of syphilis in women at antenatal care facilities. As shown in this report the decrease since 1998 is very notable. It is reasonable to associate the reduction on syphilis at antenatal clinics with a host of intervention activities and in particular the intensified programme on syndromic treatment and management of STIs in antenatal service provision points.<sup>10</sup>

The second set of data, which provides information supportive of the argument that the HIV epidemic in South Africa is stabilizing relates to HIV prevalence rates in women/girls under 20 yrs. HIV trends in teenagers are considered a good indicator of behavioural change aimed to reduce HIV infection such as a delay in sexual debut and condom use. As demonstrated in this report the early decline and stabilization are very encouraging.

### **HIV trends**

The sampling design for the national HIV prevalence study is made to enable reliable estimates of HIV at provincial level. As expected, the provinces are at different stages of the HIV epidemic and the epidemiological pattern on HIV is not the same for all provinces<sup>12</sup>

To illustrate these differences, the observation is made that KwaZulu-Natal which had reported the fastest growing epidemic and which still has the highest provincial prevalence rate is now stabilising at 33.5 %. As these studies yield prevalence and not incidence estimates, the reasons for this decrease may be numerous. The Western Cape on the other hand, has the lowest HIV prevalence rate in the country, but its HIV rate may also be stabilising at this relatively low HIV level.

### **Syphilis trends**

Syphilis sero-prevalence in South Africa is at its lowest level (2.8%) of surveillance. Syphilis trends have decreased for the third consecutive year. A remarkable decline has been observed in almost all provinces except the Northern Cape.

Effective prevention and treatment is key to successes in this area. The STI syndromic 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. These findings refer to the occurrence of new syphilis cases only and other surveillance activities such as the PHC routine surveillance programme will shed more light on overall STI infection trends.

## **6. CONCLUSIONS**

Up until 1998 South Africa was described as having one of the fastest growing epidemics in the world. The 2001 survey confirms that the trend seen since the 1998 survey indicates that this is no longer the case.

The findings of this survey are however an important pointer to the magnitude of the HIV/AIDS problem that South Africa confronts, where an estimated 4.74 million individuals are infected with HIV. 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 and maintaining the gains that South Africa is beginning to observe. The epidemiological trends in HIV prevalence should at this stage be a source of encouragement and leave no room for complacency as the numbers of individuals who are acquiring HIV infections each day is still high and the health care implications of the current infections are enormous.

This HIV survey and the expanded surveillance programme which places emphasis on high risk behaviour monitoring and monitoring HIV incidence will continue to be important in underpinning areas to strengthen the national response to HIV/AIDS.



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