



NATIONAL HIV SURVEILLANCE IN SOUTH AFRICA — 1993 - 1995

H G V Küstner, J P Swanevelde, A van Middelkoop

Objective. To determine the point prevalence of HIV infection by serological examination which, performed consistently over several years, serves to monitor the distribution and trend of the HIV epidemic in South Africa.

Design. Annual cross-sectional surveys conducted nationally in October/November.

Setting. South Africa, including areas that used to be known as self-governing and independent national states.

Subjects. Pregnant women in the age group 15 - 49 years who attend antenatal clinic services provided by the public health services.

Outcome measures. HIV positivity as determined serologically.

Results. The rising trend found previously continues: HIV positivity in South Africa was found to be 4.25% in 1993, 7.57% in 1994 and 10.44% in 1995. In 1995 the highest rate was recorded in KwaZulu-Natal (18.23%) and the lowest in the Western Cape (1.66%).

On the basis of certain assumptions it is estimated that these rates are indicative of 1.7 million sexually active adults having been infected with HIV by October/November 1995, plus a cumulative total of 40 000 infants. Women in their 20s had the highest age-specific prevalence rates, viz. 13.12% (20 - 24 years) and 11.03% (25 - 29 years). HIV positivity in pregnant teenagers was 9.5%.

Conclusions. The HIV epidemic is firmly established in South Africa with a wide variation in provincial prevalence rates. Of particular public health significance is the finding of a high and rising prevalence rate in pregnant teenagers.

The observed prevalence rate for 1995 is lower than expected, giving rise to guarded hope that provinces with the highest recorded rates are moving away from the exponential growth found hitherto.

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AIDS is one of the new diseases confronting mankind. Sub-Saharan Africa has been particularly ravaged. Evidently the epidemic moved from north to south, South Africa being about a decade behind those of its northerly neighbours showing the highest prevalence rates.¹ Under the circumstances it is of the utmost importance that health services have an instrument for monitoring the epidemic in order to plan the requisite preventive, containment and care measures. Such an instrument was instituted in 1990 by the selection of pregnant women between 15 and 49 years of age who attend antenatal clinic services offered by the public health services. Pregnant women were chosen as an indicator group of the heterosexual population, because they represent a stable subgroup that is readily accessible and in whom the trend of HIV infection should mirror that in the total heterosexual population.²

Since then, surveys have been conducted annually to assess the HIV point prevalence rate. Results for the years 1990, 1991 and 1992 have previously been published³ and those results have now been updated to 1995. Detailed descriptions of each of the six surveys, including all underlying data sets used in the calculations, can be found in the in-house disease surveillance feedback tool of the Department of Health, the *Epidemiological Comments*.^{4,5} It is to the credit of all involved in these surveys that the annual procedures were meticulously carried out, notwithstanding many impediments and insecurities that accompanied the incisive, often radical, changes that overtook the country socially, politically and economically during this period.

METHODS

The method employed in the annual surveys applicable to the years 1993, 1994 and 1995 is materially the same as that applied hitherto and is fully documented in the first report.³ The time of year has also remained constant. In broad terms about half of the expectant mothers attend the antenatal clinic services provided by the public health services. The service includes routine blood examination (ABO, rhesus and other tests).

These approximately 600 000 specimens are sampled (anonymously and unlinked) by assigning to each of the participating laboratories the number of specimens to be intercepted sequentially during October and November until the requisite sample size has been reached. The place of residence is recorded, as is age, date and result. If the residence is not supplied, then the address of the clinic being attended is accepted as proxy. As far as laboratory analyses are concerned, it should be noted that participating laboratories use their in-house screening procedures and it was therefore not possible to achieve completely uniform standardisation on agreed commercial testing procedures. Reliance is placed on the universally high quality of the work of these chosen laboratories.

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ANALYSIS OF THE DATA

The methods used in the analysis of the data have remained the same as those described previously.³ Because of the political changes the target population, namely the estimated 600 000 women attending antenatal services in the public sector, has probably increased. Firstly, the greatly improved outreach of primary health care services is a direct and immediate result of a deliberate policy change. It is likely that these services have become more accessible. Furthermore, they have been declared free services, which is also likely to have increased the number of attenders.

The geographical siting of each serum specimen by magisterial district is fairly accurately known. This has made it possible to redefine the geographical distribution of the sample from a breakdown by the previous health regions of the Department and the ten national states to a geographical distribution which corresponds with the borders of the present consolidated nine provinces. As regards the national estimates, it was decided to consider the earlier national results,^{5,9} excluding Bophuthatswana, a reasonable proxy of the situation nationally.

Age-specific point prevalence rates were estimated using all records that contained indications of age. Records of patients with unknown age were included in the calculations by distributing them across age groups in the same proportion of positivity and negativity that applied to the data on patients with known age.

To estimate the number of infected individuals in South Africa for the years in question using the annual point prevalence rate among women aged 15 - 49 years, four assumptions were made. (The method has previously been described.³)

Assumption 1. The prevalence of HIV infection among pregnant women who attend the antenatal clinic services provided by the public health services is the same as in those who do not make use of these services.

Assumption 2. The prevalence of HIV infection in women of child-bearing age who were pregnant in any given year is the same as in those who were not pregnant.

Assumption 3. The male/female ratio of HIV infection is 0.73/1.00.

Assumption 4. Thirty per cent of babies born to HIV-positive women are infected.

RESULTS

The sample

Selected characteristics of the sample are summarised in Table I, while the representativeness of the sample is illustrated in Figs 1 and 2. Fig. 1 shows the geographical distribution of specimens per year and in Fig. 2 (for each of the years separately) the age distribution of the sample is compared with

Table I. Selected characteristics of three samples of women aged 15 - 49 years who attended antenatal clinic services provided by the public health services countrywide — 1993, 1994 and 1995

	Year		
	1993	1994	1995
Number of clinic attenders	600 000+	600 000+	600 000+
Number of specimens eligible for analysis	16 206	18 630	13 741
Number of specimens positive	451	1 185	1 285

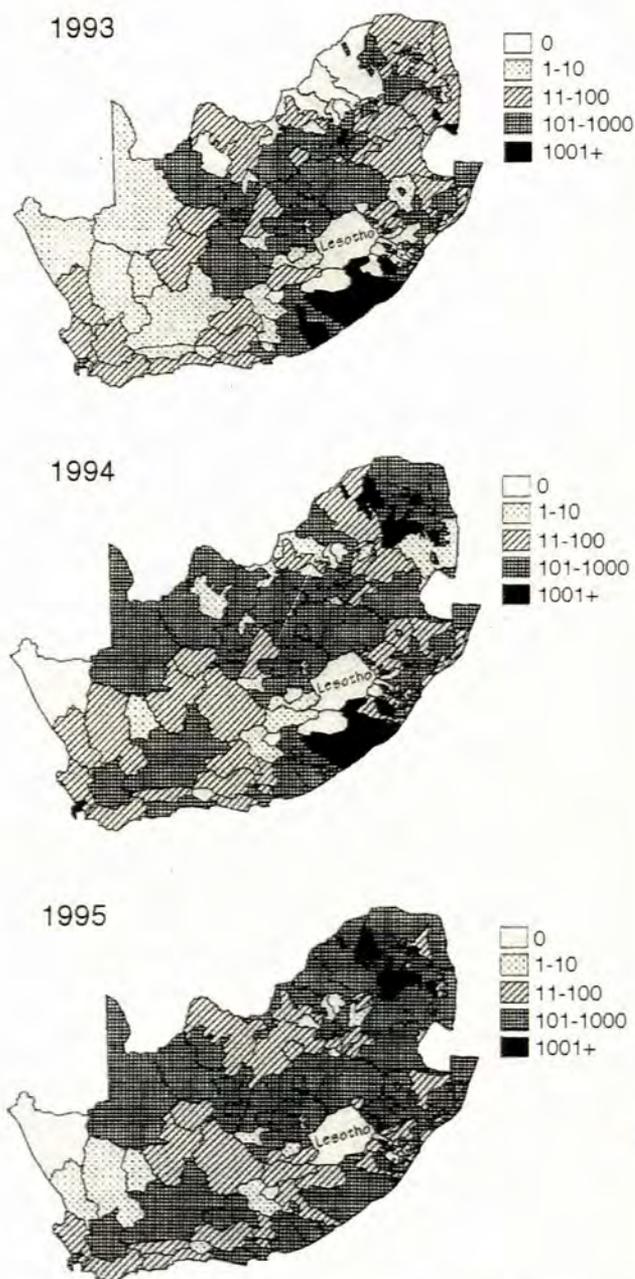


Fig. 1. Geographical distribution of antenatal specimens included in the national surveillance programme — 1993, 1994 and 1995.



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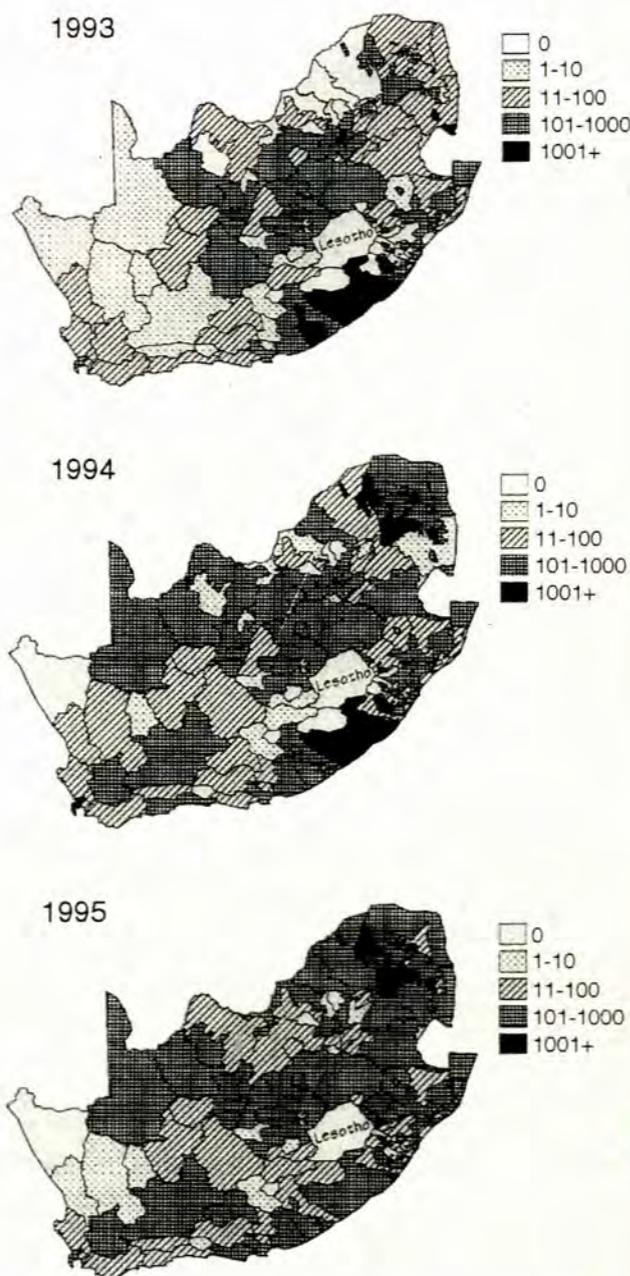


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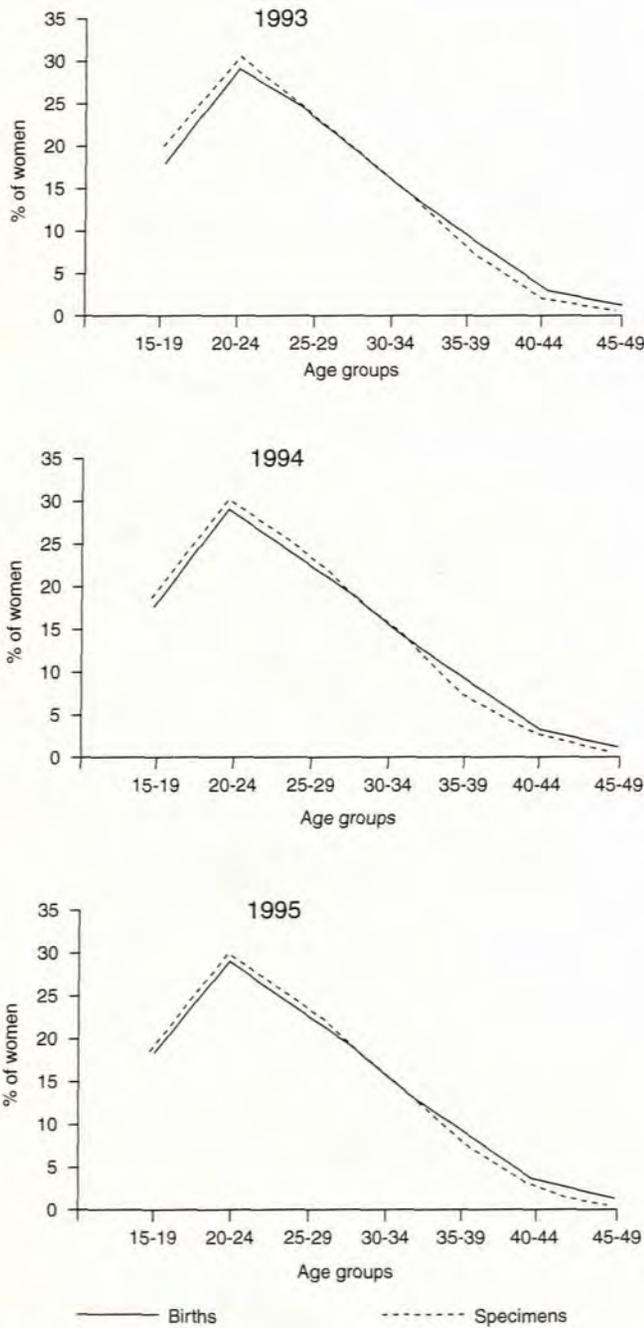


Fig. 2. Age distribution of women included in the national surveillance programme in comparison with that of women who gave birth — 1993, 1994 and 1995.

an estimate of the age distribution of all women who gave birth in the same year.

National and provincial point prevalence rates. The results of the surveys conducted in October/November of each of the years 1993, 1994 and 1995 are given in Table II. The South African epidemic curve of the HIV epidemic in the target group of women aged 15 - 49 years for the period 1990 - 1995 is shown in Fig. 3.

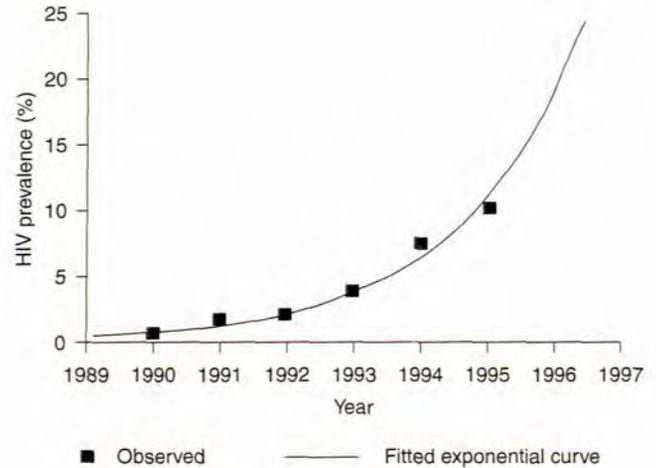


Fig. 3. The HIV epidemic in women attending antenatal clinics — 1990 - 1995.

Age-specific point prevalence rates. The age-specific rates are illustrated in Fig. 4, based on data given in Table II.

The number of HIV-infected persons in South Africa, 1993, 1994 and 1995. The number of HIV-infected people in South Africa at the end of 1995 is estimated to be about 1.7 million (Table III). This estimate excludes infections acquired homosexually, in women older than 49 years and in children aged 1 - 14 years.

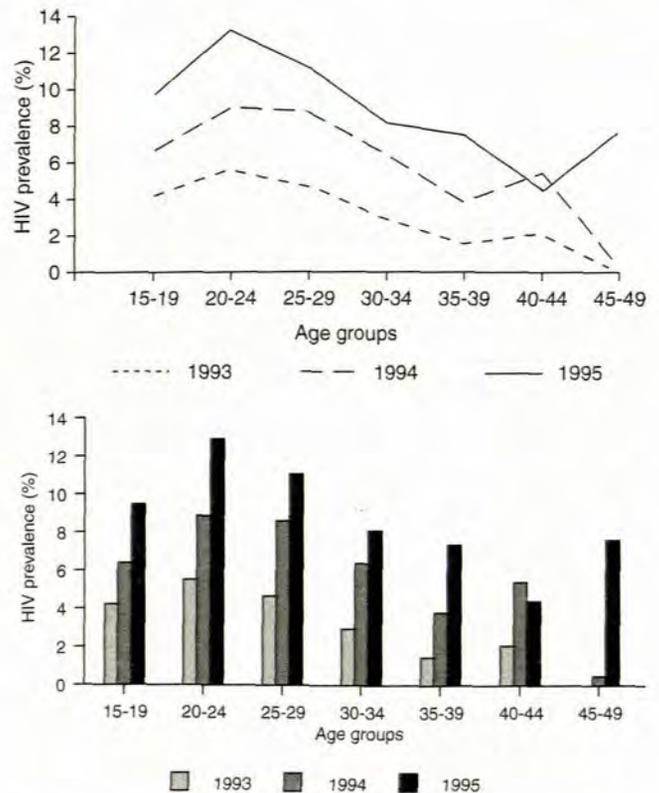


Fig. 4. The age-specific point prevalence rates in women attending antenatal clinics — 1993, 1994 and 1995.



Table II. National HIV surveys 1993, 1994 and 1995 — estimated prevalence of HIV infection in women attending antenatal clinics (%)

	1993			1994			1995		
	Est. (HIV+)	95% CI		Est. (HIV+)	95% CI		Est. (HIV+)	95% CI	
		Lower limit	Upper limit		Lower limit	Upper limit		Lower limit	Upper limit
By province									
Western Cape	0.56	0.19	0.94	1.16	0.76	1.56	1.66	0.94	2.38
Eastern Cape	1.94	1.51	2.36	4.52	3.85	5.19	6.00	4.89	7.10
Northern Cape	1.07	0.39	1.75	1.81	1.09	2.53	5.34	4.10	6.58
Free State	4.12	3.03	5.21	9.19	7.94	10.44	11.03	9.44	12.62
KwaZulu-Natal	9.53	7.96	11.11	14.35	12.22	16.48	18.23	16.31	20.15
Mpumalanga	2.40	1.77	3.04	12.16	10.55	13.76	16.18	14.40	17.96
Northern Province	1.79	1.23	2.36	3.04	2.40	3.67	4.89	4.00	5.78
Gauteng	4.13	3.19	5.06	6.44	5.63	7.25	12.03	10.36	13.70
North West	2.19	0.00	4.43	6.71	4.62	8.80	8.30	6.67	9.92
By age group (yrs)									
15 - 19	4.16	4.05	4.27	6.47	5.45	7.49	9.50	8.15	10.85
20 - 24	5.52	4.60	6.44	8.94	8.02	9.86	13.12	11.97	14.27
25 - 29	4.76	3.78	5.74	8.63	7.25	10.01	11.03	9.81	12.25
30 - 34	2.89	1.93	3.85	6.37	5.28	7.45	8.05	6.79	9.31
35 - 39	1.48	0.45	2.51	3.72	2.34	5.11	7.37	5.47	9.28
40 - 44	2.03	0.00	4.90	5.28	3.21	7.35	4.36	1.96	6.76
45 - 49	0.00	-	-	0.41	0.00	1.16	7.45	0.00	19.36

Table III. An estimate of the number of persons infected with the human immunodeficiency virus — 1993, 1994 and 1995

	1993	1994	1995
Number of women infected			
Low estimate	267 180	536 527	778 249
Best estimate	351 350	658 654	986 113
High estimate	444 117	783 782	1 233 024
Number of men infected*			
Low estimate	195 042	391 664	568 122
Best estimate	256 485	480 817	719 862
High estimate	324 206	572 160	900 107
Best estimate of HIV-infected sexually active adults			
	607 835	1 139 471	1 705 975
Number of infected babies born to pregnant cohort			
Low estimate	12 432	23 818	35 088
Best estimate	15 577	28 242	40 556
High estimate	18 823	32 678	46 185

* Estimates based on a male/female ratio of 0.73:1.

DISCUSSION

In this update of the status of HIV infection among an 'indicator group' the particulars of methodological issues and many other details are the same as documented in the first article.³ As they have not been repeated here, it would be advisable to read the two articles together. Furthermore, each of the annual national surveys has been written up in great

detail in *Epidemiological Comments*, which is available from the Department of Health on request free of charge.^{4,9}

With regard to the sample, both the repeated demonstration of high geographical coverage and the close correspondence between the age distribution of the sample and women who gave birth suggest that the sample is representative of the target population.

Given the many imponderables encountered in national surveys of this kind, especially so when dealing with biological (as opposed to purely physical) phenomena, the trend of the epidemic is remarkably consistent. An alarming finding is the continued rise in all provinces, especially because some large provinces have yet to experience the high rates found elsewhere. Evidently this matter requires further examination.

It will be recalled that for a period of 4 - 5 years, only homosexually acquired infections were documented in this country; the first cases of heterosexually transmitted AIDS were reported in the second half of 1987. The age-specific incidence rates demonstrate the relationship between the expected high levels of sexual activity in the 20s and high risk. From a public health perspective the most alarming feature is the high and rising levels of infection among pregnant teenagers, now running at close on 10%. This bodes ill for a majority of the population, in which the percentage of teenage women who have commenced childbearing has risen from 10.7% in 1990 to 15.2% in 1993.¹⁰ In similar vein, it was recently found in a study in the former Transkei that 'the prevalence of adolescent schoolgirl pregnancy was 31.3%',¹¹ and that teenagers make up a quarter of all mothers in Transkei, South Africa, and well

over 75% of them are unmarried . . . Of the 1 072 respondents, 74.6% were already sexually experienced . . .'¹²

The national HIV surveys conducted annually for the last 6 consecutive years entail a considerable added workload. In many instances personnel in the field and those working at the laboratories are already hard-pressed. For being so helpful and willing to take on this added task for the common good, all are thanked most sincerely. For the indispensable part they played in the sampling procedure and the examination of the specimens the following laboratories, their directors and heads and their staff at the workbench are thanked: the Virology Laboratories of the Universities of Cape Town, Natal and the Orange Free State and the Department of Obstetrics and Gynaecology of the latter; the National Institute for Virology; the Blood Transfusion Services of the Western Province, the Eastern Province, Border, Natal, and the South African Blood Transfusion Service; the South African Institute for Medical Research and its regional laboratories in the Northern Province, Kimberley, Bloemfontein, Bethlehem, Kroonstad and Welkom, and the laboratory of Shongwe Mission Hospital. For their assistance with capturing and editing the data, we thank the following members of the former Directorate: Epidemiology of the Department of Health very sincerely: Mesdames C Hills, D Swart, C Nagel, M de Jong and J E van Wyk, and Messrs S Swart and A Smith. A special word of thanks goes to Dr Olive Shisana, Director-General of the Department of Health, for permission to publish this report.

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