

The 2022 antenatal HIV sentinel survey- Key findings

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Background

South Africa is home to 7.5 million people living with HIV. Despite the large burden, the country has made progress, reducing both new infections and deaths from HIV by 50% and 73% from 2010 levels, respectively, by 2021.¹ By the end of 2021, the country had managed to ensure that 94% of all people living with HIV (PLHIV) knew their HIV status and 74% of those who knew their HIV positive status had initiated antiretroviral treatment (ART), with the majority virally suppressed.¹ However, children living with HIV (CLHIV) have lagged, with 52% of them on ART and their viral suppression rates lower than those of adults.² Strengthening the prevention of mother-to-child transmission of HIV (PMTCT) is necessary to reduce the burden of HIV among children.

The antenatal care HIV sentinel surveillance surveys have been conducted in the country annually since 1990 and biannually since 2015. The survey's primary objectives are to estimate overall HIV prevalence and to determine trends over time and across geographic locations (province or district) and age among pregnant women attending antenatal care at 1 589 sentinel surveillance sites in all 52 districts and nine provinces of South Africa. Since 2017³, several secondary objectives have been included to evaluate the performance of the country's PMTCT programme concerning all four programme pillars.

Aim

The surveillance programme aims to monitor trends in HIV prevalence, HIV incidence, and the progress towards the 95–95–95 targets among pregnant women between the ages of 15 and 49 attending public antenatal care (ANC) clinics at the national, provincial, and district levels.

Primary objectives

- To determine the geographical distribution and pattern of HIV seroprevalence among pregnant women between the ages of 15 and 49 who attend public ANC clinics in South Africa at the national, provincial, and district levels.
- To monitor HIV prevalence trends over time among pregnant women attending public ANC clinics in the following two domains:
 - a) 15–49 years old, at national and provincial levels.
 - b) 15–24 years old, at national level.

Secondary objectives

- To determine the proportion of HIV-positive pregnant women between the ages of 15 and 49 attending ANC clinics who know their HIV status (first 95: knowledge of HIV status).
- To determine the proportion of known HIV-positive pregnant women between the ages of 15 and 49 who receive ART (second 95: ART coverage).
- To determine the proportion of HIV-positive pregnant women between the ages of 15 and 49 on ART who are virally suppressed (third 95: viral suppression).
- To determine the proportion of HIV-positive women on ART who were taking dolutegravir (DTG)-based ARV regimens.
- To determine the prevalence of early (≤ 12 weeks) ANC attendance among pregnant women between the ages of 15 and 49 attending ANC clinics.



- To determine the coverage of maternal syphilis screening and treatment among pregnant women between the ages of 15 and 49 attending ANC clinics.
- To assess the proportion of HIV-negative pregnant women who are at risk of HIV acquisition and who would benefit from initiating pre-exposure prophylaxis (PrEP) during ANC (PrEP eligible).
- To estimate the coverage of PrEP among HIV-negative pregnant women during/before pregnancy.
- To estimate HIV incidence among pregnant women using a Recent Infection Testing Algorithm (RITA).

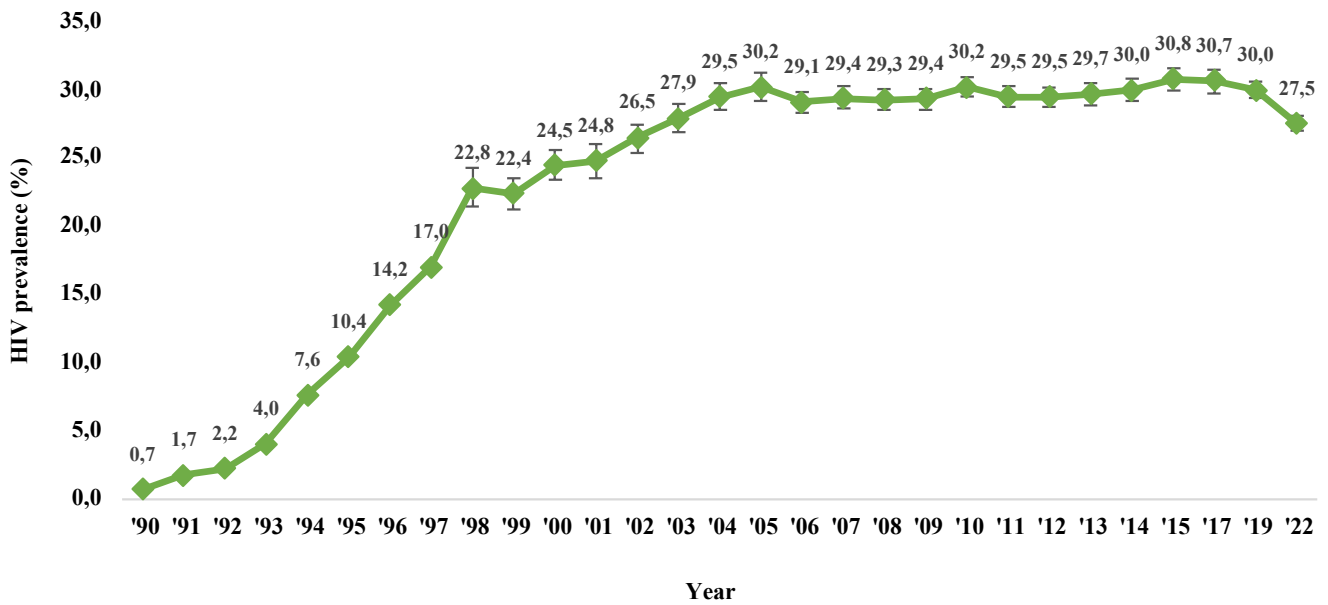
This report presents the methods, results, and discussion of all survey objectives except HIV incidence measurement.

Methods

During the surveillance period (28 February – 8 April 2022), a national representative sample of 37 828 pregnant women from 1 589 public health facilities across 52 districts of South Africa was enrolled in the survey. Sentinel sites were selected using multistage stratified cluster sampling. From each selected sentinel site, consenting women between 15 and 49 years old attending ANC were consecutively enrolled until the sample size was achieved or until the end of the survey period. The data collection procedures included a brief interview by clinic nurses as they performed their routine tasks, medical record review, and blood specimen collection. Demographic and clinical information collected from interviews and medical record review included the age of the woman, gestational age at first booking, HIV testing history, latest HIV rapid test result, ART initiation, the timing of ART initiation, use of dolutegravir (DTG-containing regimens), maternal syphilis screening and treatment coverage, as well as eligibility for and use of HIV PrEP before and during the current pregnancy. Whole blood samples were collected from participants and tested using the standard algorithm for HIV infection on an enzyme-linked immunosorbent assay (EIA) 4th-generation platform. All analyses took into account the survey design (clustering within facilities and stratification by district) and were weighted for sample size realisation (at the district level) and for the Statistics South Africa (Stats SA) 2021 mid-year population size of women of reproductive age (15–49 years) at the provincial level.⁴

Results

The overall HIV prevalence at the national level was 27.5% (95% confidence interval (CI): 27.0 – 28.1) and represents a 2.5% point decline from the 2019 estimate (Figure 1). The highest overall HIV prevalence was in KwaZulu-Natal Province (37.2%, 95% CI: 35.8 – 38.5), followed by Eastern Cape Province (32.9%, 95% CI: 31.5 – 34.2). The lowest overall HIV prevalence was in Western Cape Province at 16.3% (95% CI: 15.0 – 17.6). The overall HIV prevalence estimates were lower than the 2019 estimates in all nine provinces. By district, the highest HIV prevalence was reported in uMkhanyakude District at 44.0% (95% CI: 37.6 – 50.6). HIV prevalence was higher than the national average in 27 districts.



*Both first-ANC-visit attendees and follow-up visit attendees were included in the 2015, 2017, 2019, and 2022 surveys

Figure 1. The HIV epidemic curve among antenatal women, South Africa, 1990 – 2022 Antenatal HIV Sentinel Survey, South Africa.

Nationally, of 10 726 participants found to be HIV-positive by the EIA test, 96.0% (10 300) already knew their HIV-positive status at the time of the survey (Figure 2). Of those who knew their HIV-positive status, 98.8% (10 166) were initiated on ART at the time of the survey.

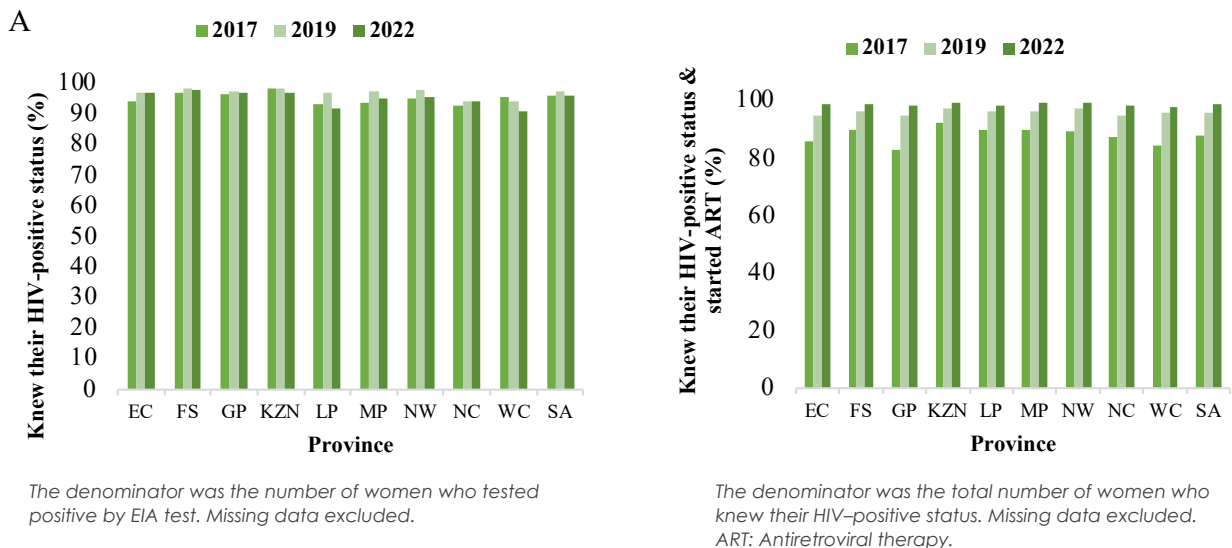
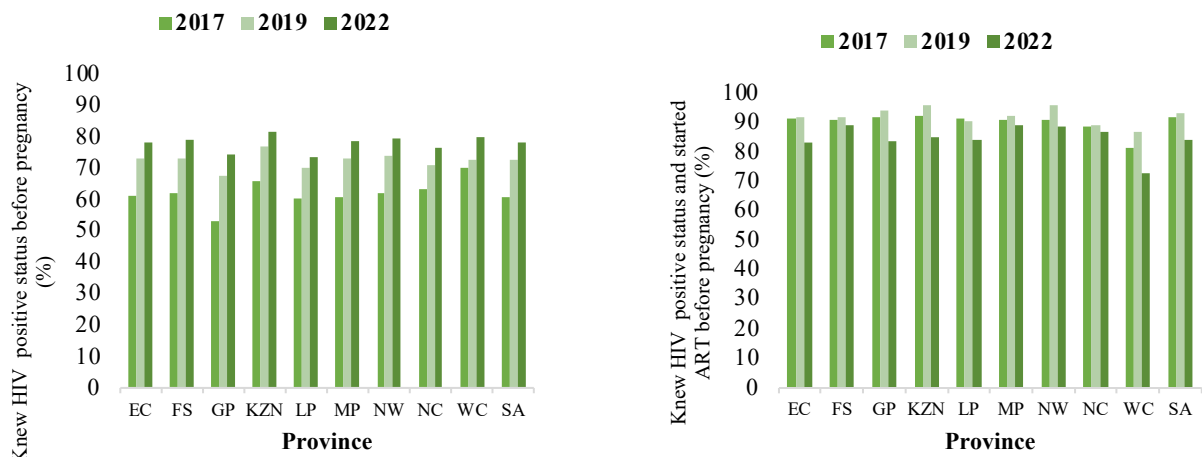


Figure 2. Knowledge of HIV-positive status (A) and ART initiation (B) by province in the 2017, 2019, and 2022 Antenatal HIV Sentinel Survey, South Africa.

Of the 10 300 EIA-positive participants whose timing of (HIV) diagnosis was reported, 78.1% (7 957) knew their HIV-positive status before pregnancy, while of those who knew their HIV-positive status prior to pregnancy and whose treatment status was reported (7 296), 6 173 (84.2%) were initiated on ART prior to pregnancy (Figure 3).



The denominator for knowledge of HIV-positive status before pregnancy was EIA positive participants. Missing data excluded.

ART: antiretroviral therapy. The denominator for ART initiation before pregnancy was the number of HIV-positive women who were aware of their HIV-positive status before pregnancy. Missing data excluded.

Figure 3. Knowledge of HIV-positive status (A) and ART initiation (B) prior to pregnancy by province in the 2017, 2019, and 2022 Antenatal HIV Sentinel Survey, South Africa.

The national maternal viral load testing coverage was 88.1%. The coverage of viral load testing was greater than 80.0% across all provinces (Figure 4). Of those who had a viral load test done and were due for a viral load test, 79.9% had received their viral load results. Among those who had a viral load test and received results, 74.1% were virally suppressed (<50 copies/ml).

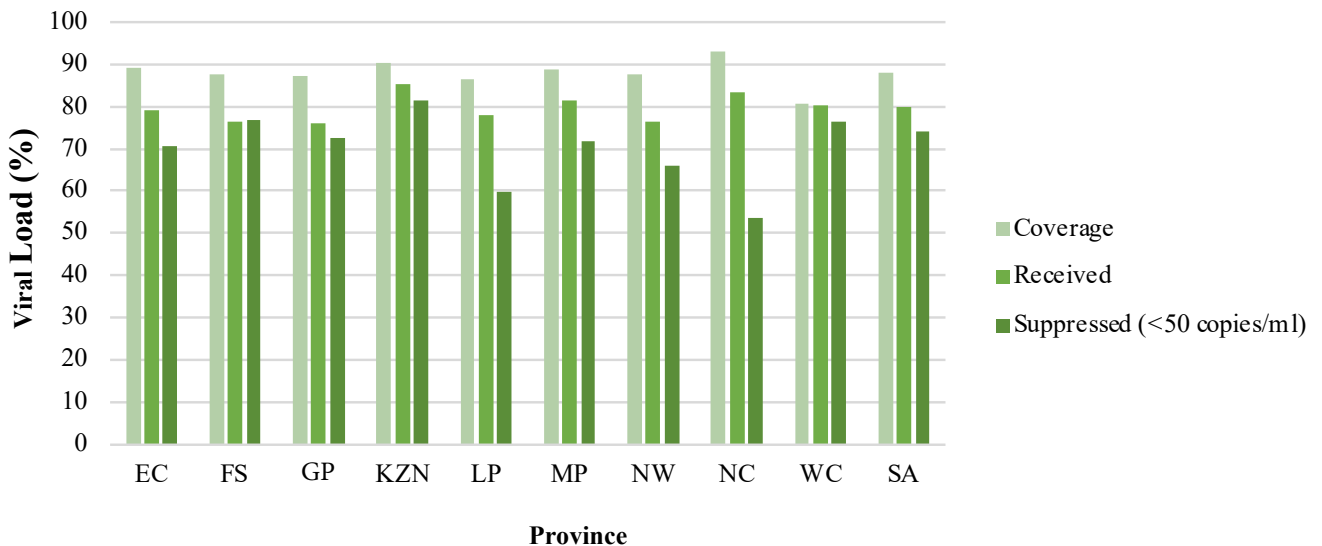


Figure 4. Viral load testing among antenatal women in the 2022 HIV Antenatal Survey, South Africa.

The proportion of participants with a viral load > 1,000 copies/ml was 9.5% nationally, with Northern Cape Province having the highest proportion (26.1%) while the lowest proportion was in KwaZulu-Natal Province (5.6%) (Figure 5).

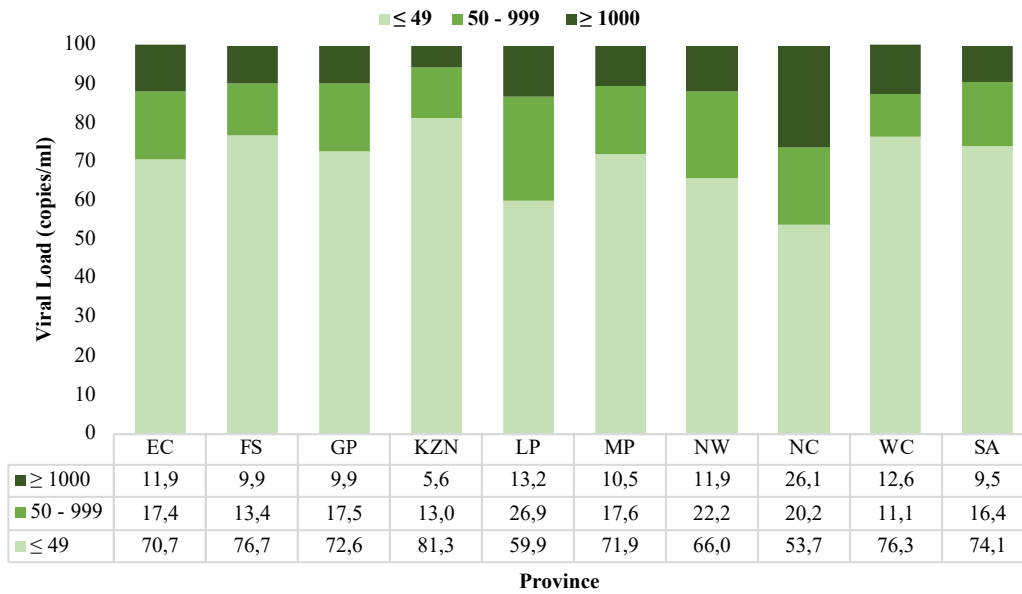


Figure 5. Viral load results (copies/ml) by province in the 2022 Antenatal HIV Sentinel Survey, South Africa.

The coverage of DTG among women taking ART at the national level was 67.9% (Figure 6). Northern Cape Province had the lowest coverage of DTG (34.4%), and KwaZulu-Natal Province had the highest (80.0%).

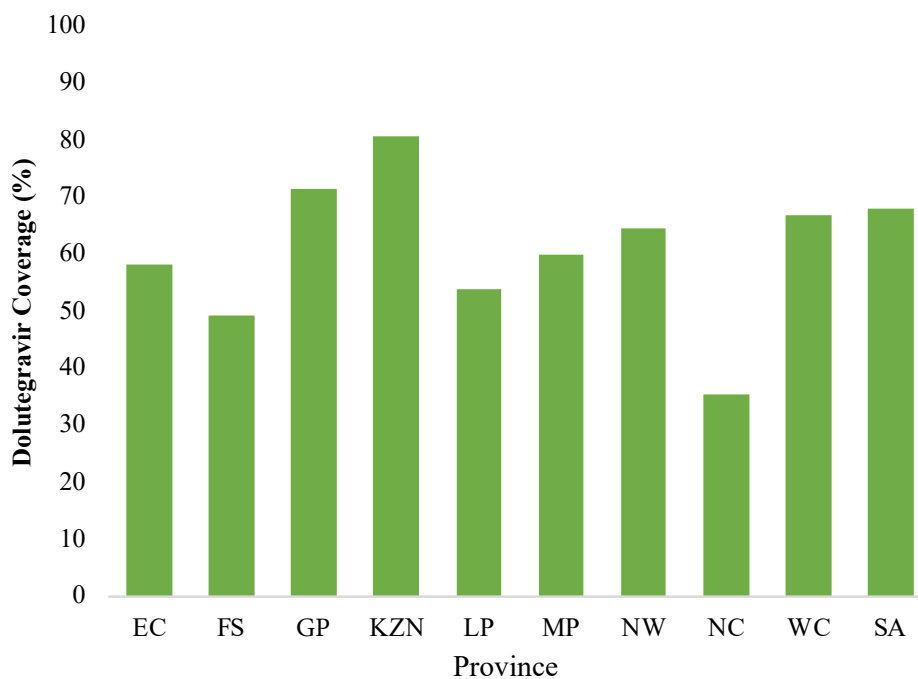


Figure 6. Dolutegravir treatment coverage by province among antenatal women in the 2022 HIV Antenatal Survey, South Africa.

Overall, there was good negative and positive percent agreement between HIV results based on medical record review (routine programme data) and the laboratory (EIA results). The overall negative percent agreement was 94.4% (95% CI: 93.9 – 94.8) and was highest in the Eastern Cape Province at 97.6% (95% CI: 96.9 – 98.2) and lowest in the North West Province at 89.5% (95% CI: 87.3 – 91.3) (Figure 7). The overall positive percent agreement was high at 97.3% (95% CI: 97.0 – 97.5) and varied across provinces, from 94.0% (95% CI: 92.4 – 95.3) in Limpopo Province to 98.5% (95% CI: 97.7 – 99.0) in Free State Province.

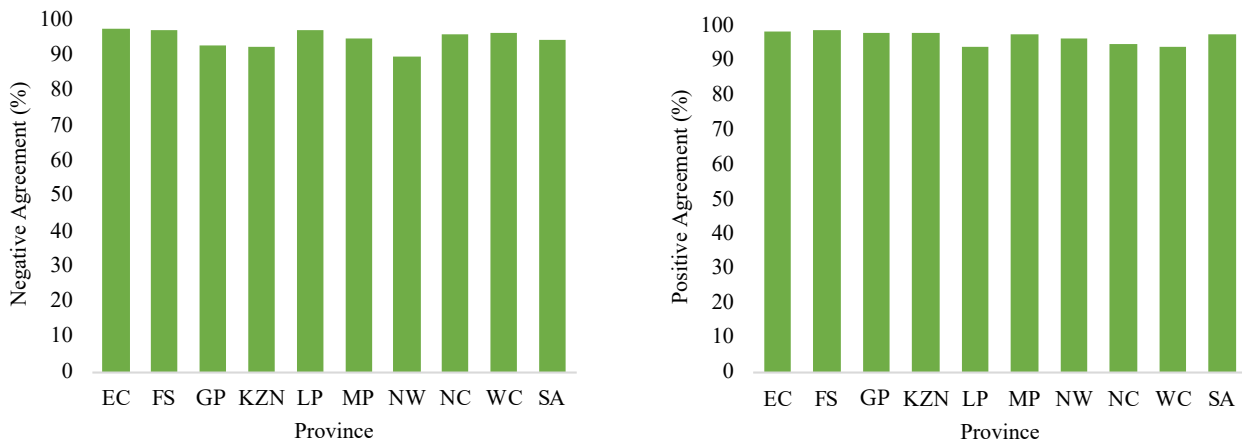
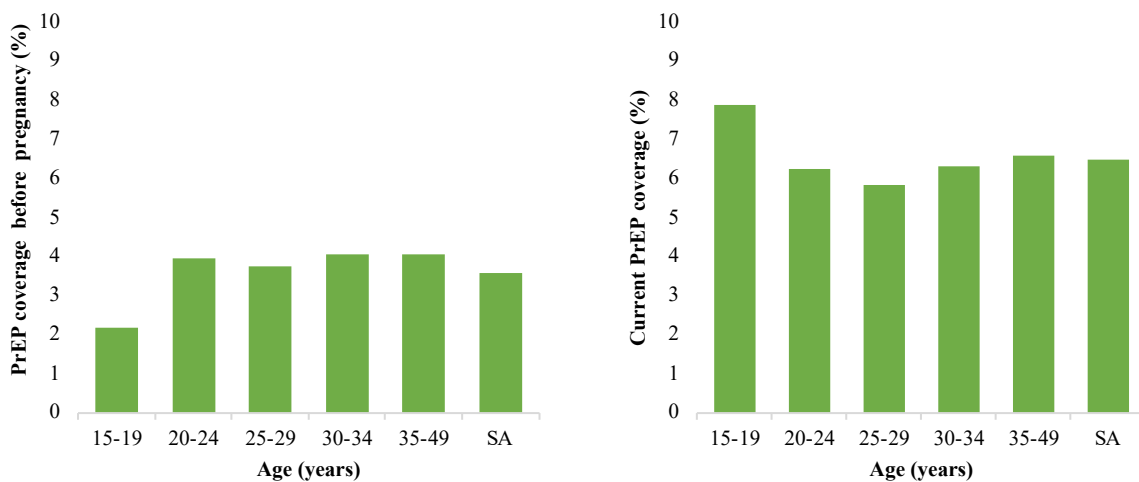


Figure 7. HIV status agreement between routine programme data (medical records) and antenatal survey (EIA testing) of negative (A) and (B) positive HIV test results, 2022 Antenatal HIV Sentinel Survey, South Africa.

Nationally, 31.2% (7 271 out of 22 655) of HIV-negative women were eligible for PrEP. Among those eligible for PrEP and whose prior use of PrEP was reported, 3.6% (95% CI: 3.2 – 4.0) were on PrEP before pregnancy. Current use of PrEP was 6.5% (95% CI: 5.7 – 7.4) of eligible patients whose current PrEP use was reported (Figure 8). PrEP coverage before pregnancy was significantly lower among younger women (15–19 years) compared to older women (35–49 years).



The denominator for PrEP coverage before pregnancy was the number of HIV-negative women who met the PrEP eligibility criteria. Missing data excluded.

The denominator for PrEP coverage during the current pregnancy was the number of HIV-negative women who met the PrEP eligibility criteria. Missing data excluded.

Figure 8. PrEP coverage before pregnancy (A) and during current pregnancy (B) in the 2022 Antenatal HIV Sentinel Survey, South Africa.

Only 25.8% of participants attended their first ANC visit before or at 12 weeks of pregnancy, per the World Health Organization's (WHO) recommendation (Figure 9). Less than two-thirds (61.0%) of participants attended their first ANC visit before 20 weeks of pregnancy, lower than the 70.0% reported in 2019.

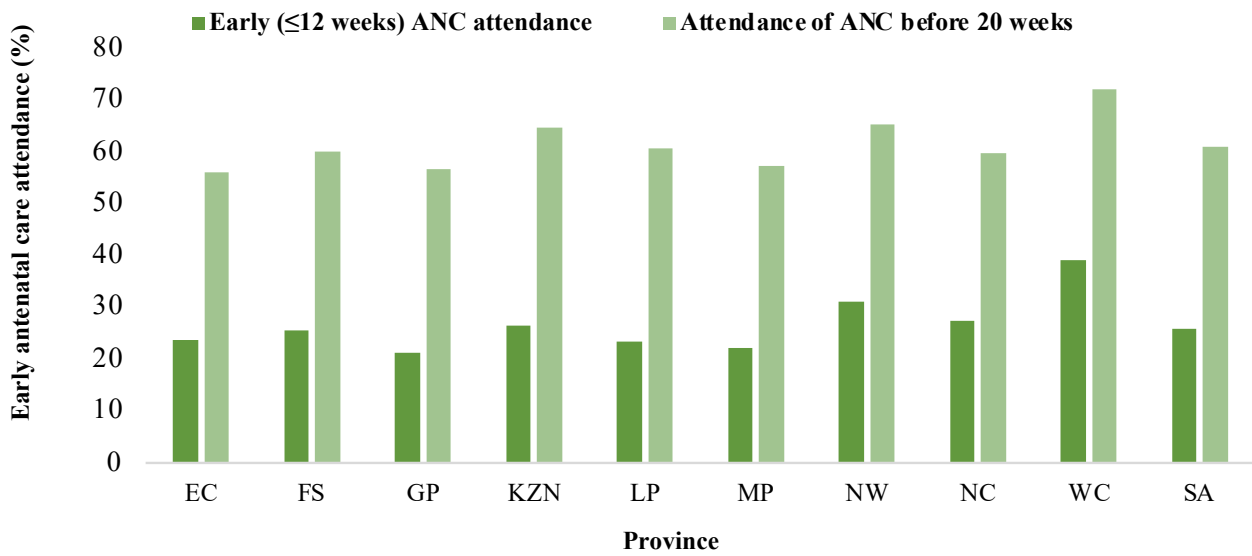
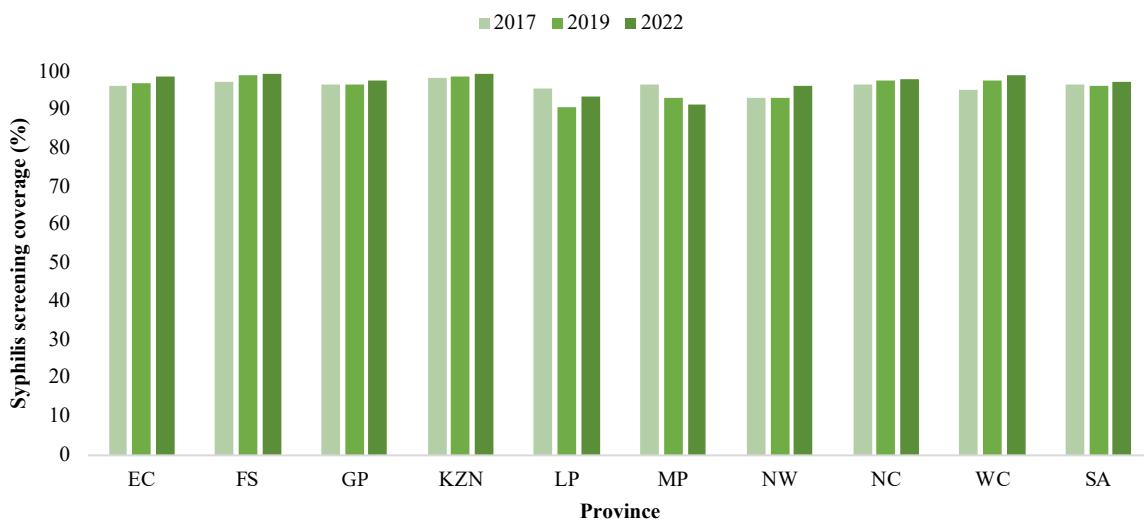


Figure 9. Early antenatal care attendance by province in the 2022 Antenatal HIV Sentinel Survey, South Africa.

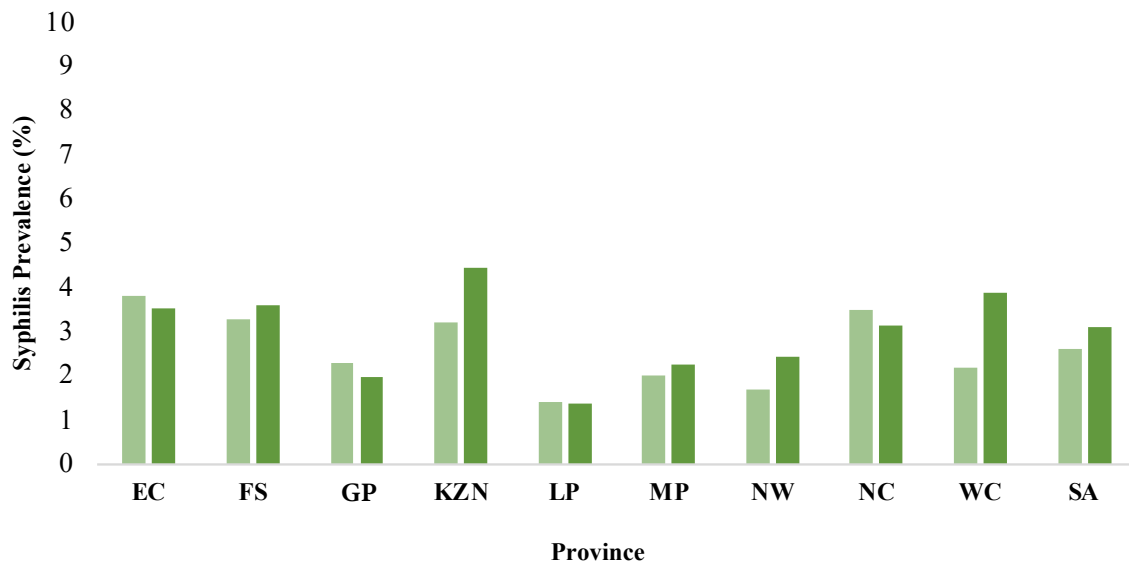
Maternal syphilis screening coverage was 97.5% at the national level. All provinces had greater than 90.0% syphilis screening coverage (Figure 10).



The denominator for syphilis screening coverage was the number of women who completed the questionnaire. Missing data excluded.

Figure 10. Maternal syphilis screening coverage among antenatal women in the 2017, 2019, and 2022 Antenatal HIV Survey, South Africa.

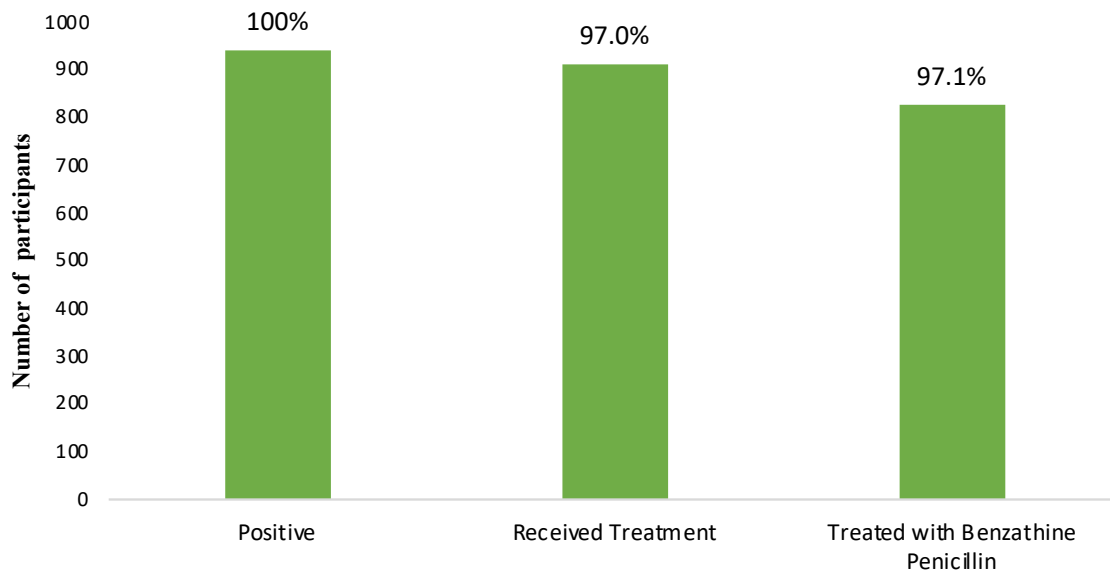
Of the women who were screened for syphilis, 2.6% (992) were positive, 78.2% (27 677) were negative, 18.4% (5 516) had pending results, and 0.9% (262) did not have results in their files. After excluding the pending results and the results not in the file, the prevalence of syphilis (per medical record review data) among those who had syphilis test results was 3.1% (95% CI: 2.9 – 3.3) at the national level (Figure 11). The highest syphilis prevalence was in KwaZulu-Natal Province at 4.4% (95% CI: 4.0 – 5.0) and the lowest was in Limpopo Province at 1.4% (95% CI: 1.0 – 1.9).



The denominator for syphilis prevalence was the number of women who received syphilis test results. Missing data excluded.

Figure 11. Maternal syphilis prevalence among antenatal women in the 2022 HIV Antenatal Survey, South Africa.

Of 941 participants who were syphilis-positive and whose syphilis treatment status was reported, 97.0% (911) received treatment for syphilis (Figure 12). Of those treated for syphilis and having the type of treatment data reported (847), 97.1% (827) were treated with at least one dose of Benzathine penicillin G (BPG) – this translates to 85% coverage of syphilis treatment with at least one dose of BPG among all syphilis-positive participants.



*5.0% (51) of syphilis-positive participants and 8.2% (64) participants treated for syphilis had not responded to the questions about syphilis treatment and type of treatment (Benzathine penicillin), respectively; these were excluded from the denominators for syphilis treatment and treatment with Benzathine penicillin, respectively.

Figure 12. Syphilis treatment cascade among antenatal women in the 2022 HIV Antenatal Survey, South Africa.



Discussion and conclusions

In this first post-COVID survey, the profile of pregnant women enrolled did not differ from that of women enrolled in the 2019 survey. After remaining essentially unchanged since 2004, HIV prevalence among pregnant women declined. The decline could have been driven by cohorts with higher HIV prevalence ageing out of the reproductive age and being replaced by younger cohorts with a lower HIV prevalence or due to changes in the underlying age structure of women participating in the surveys. There was near universal knowledge of HIV testing and coverage of ART among pregnant women who were living with HIV. There was, however, a decline in the proportion of pregnant women living with HIV (WLHIV) who knew their HIV status and had initiated ART before pregnancy. This could have been due to the effect of the COVID-19 pandemic and associated restrictions on HIV testing and ART initiations.^{5,6} Viral suppression levels remained the same as in the previous survey (2019)⁷ despite implementing new PMTCT guidelines and DTG roll-out.⁸ The coverage of DTG among pregnant WLHIV on ART was sub-optimal. Early ANC attendance also declined, likely due to COVID-19 and its impact on ANC visits.⁶ PrEP coverage was low in all provinces, despite close to a third of HIV-negative women being eligible for it.

The 2022 survey was subject to some limitations:

- The survey did not include pregnant women younger than 15 years or older than 49 years.
- The survey was restricted to public facilities, which may limit the generalisability of the findings to the overall population, especially to high-income groups and some racial groups.
- Sample realisation was high at 104% nationally. However, at the provincial level, sample realisation was below 90% in North West Province (85.5%).
- The overall proportion of individuals excluded after the interview was similar between the 2019 and 2022 surveys, at 10.7% in 2019 and 11.8% in 2022. However, the percentage of individuals excluded because of specimen rejection was lower in 2022 compared to 2019.
- Compared to previous surveys, missing data and inconsistent reporting were similarly high. This was a particular concern for HIV testing, ART and viral load data, as well as data on parity, gravidity, and gestational age. Data cleaning allowed for resolving some inconsistencies, while others that could not be resolved were set to missing, potentially biasing results. The antenatal survey is collected by National Department of Health (NDoH) staff or nurses providing ANC services. Limited supervision and monitoring support was given at the site level for nurses collecting the data as the district team designated to coordinate and supervise survey implementation had other conflicting commitments/responsibilities, which resulted in inadequate support for the survey. However, Genesis Analytics provided WhatsApp and telephone support during the survey. In addition, the availability of a training video on YouTube allowed for better cascading of training by the trainers.

Recommendations for policy, practice, and research

Policy and practice

- Continue to strengthen and promote early ANC attendance.
- Strengthen HIV testing and ART initiation among women of reproductive age living with HIV.
- Strengthen retention in care and adherence to ARV medications among pregnant women living with HIV throughout pregnancy and the postpartum period.
- Maintain viral load monitoring for and return of results to pregnant WLHIV to ensure women are virally suppressed and that both low-level and high-level viraemia are responded to timeously.



- Expedite the roll-out of the dual HIV/syphilis and single syphilis tests for pregnant women, their partners, individuals presenting to STI services, and other priority populations to identify and treat individuals with active syphilis for treatment.
- Promote male circumcision and condom use as strategies for the primary prevention of maternal and congenital syphilis. These warrant a further focus on their inclusion in existing prevention strategies.

Further analyses, future surveys, and research

- Conduct more in-depth analyses of new indicators – PrEP eligibility and coverage as DTG coverage among women on ART – and correlate these indicators with HIV incidence of new HIV infections and viral suppression, respectively.
- Triangulate HIV prevalence estimates from the ANC survey with other data sources, such as the HSRC's HIV Prevalence, Incidence, Behaviour and Communication Survey (SABSSM) to understand the drivers of the declining HIV prevalence apparent in this survey.
- Triangulate ANC attendance, viral load coverage, and viral suppression data with the District Health Information System (DHIS) and Demographic Health Surveys (DHS) to better understand trends observed in the survey.
- Triangulate DTG coverage data with DHIS data at the national and provincial levels.
- Conduct further research into healthcare worker and client-related barriers and challenges to the roll-out of DTG among pregnant women in the country, particularly in provinces with low coverage with DTG, e.g., Northern Cape Province.
- Conduct further research into healthcare worker and client-related barriers and challenges to the roll-out of PrEP among HIV-negative pregnant women.
- Research into the effectiveness, acceptability, and feasibility of Doxycycline post-exposure prophylaxis (PEP) as an intervention for preventing sexually transmitted infections (STIs) in the country.
- Measure syphilis prevalence directly in future surveys to validate syphilis positivity from medical records.
- Conduct evaluations to determine the completeness of data concerning key survey indicators and the quality of HIV testing data from medical records to complement ANC surveys with routine ANC data. Key variables will include HIV testing, ART use, and viral load completion and results.

Acknowledgements

We thank the following for their contributions:

- NICD: Selamawit Woldesenbet, Zinhle Brukwe, Deirdre Greyling.
- Genesis Analytics: Sue Aitken, Tamika Fellows and Sukoluhle Pilime, Data clerks
- Provincial and district HAST/ M&E teams, Facility nurses
- CDC: Mireille Cheyip, Kassahun Ayalew,
- SAMRC: Carl Lombard, Samuel Manda

Funding

This report was funded by the NDoH and supported by the President's Emergency Plan for AIDS Relief (PEPFAR) through the Centers for Disease Control and Prevention under the terms of Cooperative Agreement Number 5U2GGH001631.



Conflicts of interest

The authors declare no conflicts of interest.

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