

The 2022 Antenatal HIV Sentinel Survey

Key Findings



health

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Executive Summary

Background

South Africa is home to 7.5 million people living with HIV. Despite the large burden, the country had made progress, reducing both new infections and deaths from HIV by 50% and 73% from 2010 levels, respectively by 2021. 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. 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 determine HIV prevalence 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 in the country. Since 2017, several secondary objectives intended to evaluate the performance of the country's PMTCT programme concerning all four programme pillars have been included. The aims and objectives of the 2022 edition of the survey were as follows:

Aim

To monitor trends in HIV prevalence, HIV incidence, and the progress towards the 95–95–95 targets among pregnant women of age 15 to 49 years 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 years 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 15–49 years old attending ANC clinics who know their HIV status (1st 95: knowledge of HIV status).
- To determine the proportion of known HIV-positive pregnant women 15–49 years old who receive ART (second 95: ART coverage).
- To determine the proportion of HIV-positive pregnant women 15–49 years old 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 15–49 years old attending ANC clinics.
- To determine the coverage of maternal syphilis screening and treatment among pregnant women 15–49 years old attending ANC clinics.

- To assess the proportion of HIV-negative pregnant women who are at risk of HIV acquisition on 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 nationally 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 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 province level.

Results

The overall HIV prevalence at national level was 27.5% (95% confidence interval (CI): 27.0 – 28.1) and represents a 2.5% point decline from the 2019 estimate. The highest overall HIV prevalence was in KwaZulu-Natal (37.1%, 95% CI: 35.8 – 38.) followed by Eastern Cape (32.9%, 95% CI: 31.5 – 34.2). The lowest overall HIV prevalence was in Western Cape 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). There were 27 districts whose HIV prevalence was higher than the national average.

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. Of those who knew their HIV-positive status, 98.8% (10 166) were initiated on ART at the time of the survey. 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. The national maternal viral load testing coverage was 88.1%. Coverage of viral load testing was greater than 80.0% across all provinces. 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). The proportion of participants with a viral load >1 000 copies/ml was 10.0%, nationally, with Northern Cape having the highest proportion (26.7%) while the lowest proportion was in KwaZulu-Natal (5.9%). The coverage of DTG among women taking ART at the national level was 65.4%. Northern Cape had the lowest coverage of DTG (34.4%), and KwaZulu-Natal had the highest coverage of DTG (80.0%).

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 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). 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 to 98.5% (95% CI: 97.7 – 99.0) in Free State.

Nationally, 31.2% (7 271 out of 22 655) of HIV-negative women were eligible for PrEP. Among those who were 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 those who were eligible and whose current PrEP use was reported. PrEP coverage before pregnancy was significantly lower among younger women (15 – 19 years) compared to older women (35 – 49 years).

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

Maternal syphilis screening coverage was 97.5% at the national level. All provinces had greater than 90.0% syphilis screening coverage. 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 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. The highest syphilis prevalence was in KwaZulu-Natal at 4.4% (95% CI: 4.0 – 5.0) and the lowest was in Limpopo at 1.4% (95% CI: 1.0 – 1.9). Of 941 participants who were syphilis-positive and whose syphilis treatment status was reported, 97.0% (911) received treatment for syphilis. Of those treated for syphilis and had 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).

Discussion and conclusions

In this first post-COVID survey, the profile of pregnant women enrolled in the survey did not differ from that of women enrolled in the 2019 survey. After remaining largely 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. However, there was 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. Viral suppression levels remained the same as in the previous survey (2019) despite implementing new PMTCT guidelines and DTG roll-out. 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. 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

- Pregnant women younger than 15 years or older than 49 years were not included in the survey.
- The survey was restricted to public facilities, which may limit the generalizability 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 (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 the resolution of some inconsistencies while some that could not be resolved were set to missing, potentially biasing results. The antenatal survey is collected by 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 provision of support to the survey. However, G:ENESIS Analytics provided WhatsApp support and telephonic support during the survey. In addition, the availability of a training video on YouTube allowed for better cascading of training by the trainers.

Suggestions for policy, practice and research

Suggestions for 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

- Promoting male circumcision and condom use as strategies for primary prevention of maternal and congenital syphilis warrants further focus for inclusion in existing prevention strategies.

Suggestions for 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 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 District Health Information System (DHIS) and Demographic Health Surveys (DHS) in order to better understand trends observed in the survey.
- Triangulate DTG coverage data with DHIS data at the national and provincial level.
- 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.
- 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 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 in order to validate syphilis positivity from medical records.
- Conduct evaluations to determine the completeness of data with respect to key survey indicators as well as the quality of HIV testing data from medical records with a few to complementing ANC surveys with routine ANC data. Key variables will include HIV testing, ART use and viral load completion and results.

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Acronyms

AGYW	Adolescent Girls and Young Women
AIDS	Acquired Immunodeficiency syndrome
ANC	Antenatal care
ANCHSS	Antenatal HIV Sentinel Survey
ART	Antiretroviral treatment
ARV	Antiretroviral
BPG	Benzathine Penicillin G
CDC	Centers for Disease Control and Prevention
CI	Confidence Interval
CLHIV	Children living with HIV
COJ	City of Johannesburg
DHIS	District Health Information System
DHS	Demographic Health Survey
DTG	Dolutegravir
EC	Eastern Cape province
EIA	Enzyme-linked immunosorbent assay
eMTCT	Elimination of mother-to-child transmission
FS	Free State province
GP	Gauteng province
HIV	Human Immunodeficiency Virus
HSRC	Human Sciences Research Council
IQR	Interquartile range
KZN	KwaZulu-Natal province
LP	Limpopo province
MP	Mpumalanga province
MTCT	Mother-to-child transmission
NC	Northern Cape province
NDoH	National Department of Health
NHLS	National Health Laboratory Service
NICD	National Institute for Communicable Diseases
NMM	Nelson Mandela Municipality
NMM	Ngaka Modiri Molema
NSP	National Strategic Plan
NW	North West province
OMR	Optical Mark Recognition
PEP	Post-exposure prophylaxis
PLHIV	People living with HIV
PMTCT	Prevention of mother-to-child transmission
PPA	Percent positive agreement
PPS	Probability Proportional to Size
PrEP	Pre-exposure prophylaxis
PSU	Primary Sampling Unit
RITA	Recent Infection Testing Algorithm
RPR	Rapid plasma regain
SAMRC	South African Medical Research Council

SANAS	South African National Accreditation System
Stats SA	Statistics South Africa
STIs	Sexually Transmitted Infections
UNAIDS	The Joint United Nations Programme on HIV/AIDS
VL	Viral Load
WC	Western Cape Province
WHO	World Health Organization
WLHIV	Women living with HIV

Glossary

Term	Definition
Gravidity	The number of times a woman has been pregnant, regardless of whether the pregnancies resulted in a live birth or not
Gestational age	Used to describe how far along the pregnancy is (weeks)
Viral load suppression	defined as having less than 50 copies of HIV per milliliter of blood
Prevalence	The proportion of a population who have a specific characteristic or condition in a given time period
Syphilis screening coverage	The proportion of pregnant women with a documented syphilis test
Viral load testing coverage	The proportion of individuals eligible for viral load testing who had a viral load test done
Sample size realization	The proportion of sample size that was achieved from the target sample size

Chapter 1: Introduction

1.1. Background

South Africa remains the global epicentre of the HIV epidemic, accounting for more than a quarter of new HIV infections in East and Southern African countries and an estimated 7.5 million people living with HIV (PLHIV) in 2021(1). Despite having the largest HIV epidemic, the country had made significant progress in reducing new HIV infections and AIDS related deaths by 50% and 73% from 2010 levels, respectively by 2021(1). Access to HIV testing and effective antiretroviral therapy (ART) has improved substantially with the implementation of the test and treat initiative, and increased availability of affordable drugs with fewer side effects. The country remains committed to the Joint United Nations Programme on HIV/AIDS (UNAIDS) 95–95–95 targets which aim to ensure 95% of PLHIV know their HIV status, 95% of people with diagnosed HIV receive sustained ART and 95% of people on ART have viral suppression by 2030.

An estimated 94% of people living with HIV knew their HIV status in 2021(1). As of December 2021, of those who knew their status, only 74% of HIV-positive people nationally were receiving ART, which is below the 90% ART coverage target for all PLHIV and 95% target for those who know their status by 2030. With respect to the viral suppression, an estimated 67% of all PLHIV were virally suppressed in 2021, also below the 86% target for all PLHIV and 95% of those on ART by 2030 (1). Children under the age of 15 years who make up 3.6% of all PLHIV have not fared as well. Only 48% of children living with HIV were on ART compared to 78% among adult females and 75% among adult males. Strengthening all four pillars of the PMTCT programme – prevent HIV among females of reproductive age, prevent unintended pregnancies among women living with HIV (WLHIV), prevent vertical transmission of HIV from pregnant WLHIV and provide care and treatment to WLHIV and their children is required to reduce the burden of HIV among children.

The country's national strategic plan (NSP) for 2017–2022 focused HIV responses on areas and populations that have been disproportionately affected by the disease (2). Pregnant women as well as adolescent girls and young women (AGYW) were priority populations listed in the NSP. AGYW were priority due to the high rate of HIV infection in this population. In 2021, AGYW (15–24 years) accounted for 25% of all new infections in the country while women aged 15–49 years accounted for 51% of new infections (1). At 187 000, the estimated number of new HIV infections in South Africa in 2021 represented a 50% reduction from 2010 levels (1). Despite this significant decrease, the number of new infections still fell short of the NSP target of 100 000 by 2022 (3).

The antenatal HIV sentinel survey (ANCHSS) is a survey conducted biennially in South Africa to monitor the HIV epidemic and the progress towards the 95–95–95 targets among pregnant women, a significant proportion (about 40%) of whom are adolescent girls and young women (4–6). The survey addresses several important public health questions relevant for programme and policy planning/evaluation. The last (2019) antenatal survey which estimated HIV prevalence, HIV incidence and progress towards the 95–95–95 targets at national and sub-national level showed progress in ART initiation before pregnancy, early ANC attendance and viral suppression among pregnant women (5). At the same time, the survey showed high levels of unintended pregnancy (76.3% among women aged 15–19 years and 51.6% overall), a sub-optimal agreement between HIV testing as reported using routine ANC data compared to laboratory testing and a sub-optimal viral suppression rate (<70%) among pregnant women (5). The 2019 survey highlighted the need to improve the implementation of preconception care including HIV testing before conception and early

ANC attendance so that treatment for HIV-positive women can be initiated as early as possible.

This report presents the findings of the 2022 antenatal survey. The 2022 survey assessed the HIV status of pregnant women (i.e., HIV prevalence and HIV incidence) (based on laboratory results), coverage of ART, coverage of routine viral load monitoring and viral load suppression among pregnant women (based on record review) attending ANC services in selected sentinel sites from across all districts of South Africa. The following were also estimated in the 2022 antenatal survey: coverage of early ANC attendance, dolutegravir (DTG) containing regimens, and of maternal syphilis screening, syphilis prevalence among pregnant women screened for syphilis (based on record review) and coverage of treatment among syphilis-positive women. These indicators are crucial for improving pregnancy outcomes of both HIV-negative and HIV-positive women and are key measurements of progress towards the joint elimination of HIV and syphilis. Lastly, the survey also estimated PrEP eligibility, knowledge of PrEP and PrEP coverage among PrEP eligible HIV-negative women enrolled in the survey.

1.2. Aim

To monitor trends in HIV prevalence, HIV incidence, and the progress towards the 95–95–95 targets among pregnant women aged 15 to 49 years attending public ANC clinics at national, provincial and district levels.

1.2.1. Primary objectives

- To determine the geographical distribution and pattern of HIV seroprevalence among pregnant women aged of 15 to 49 years attending 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.

1.2.2. Secondary objectives

- To determine the proportion of HIV-positive pregnant women aged 15–49 years old attending ANC clinics who know their HIV status (1st 95: knowledge of HIV status).
- To determine the proportion of known HIV-positive pregnant women aged 15–49 years old receiving ART (second 95: ART coverage).
- To determine the proportion of HIV-positive pregnant women 15–49 years old on ART who are virally suppressed (third 95: viral suppression).
- To determine the proportion of HIV-positive women on ART who were taking DTG-based ARV regimens.
- To determine the prevalence of early (≤ 12 weeks) ANC attendance among pregnant women aged 15–49 years old attending ANC clinics.
- To determine the coverage of maternal syphilis screening, syphilis seropositivity and coverage of treatment among pregnant women aged 15–49 years old 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 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 attending ANC using a Recent Infection Testing Algorithm (RITA)

Data on HIV incidence has not been included in this report as the test results for this indicator were not available at the time when this report was written. The HIV incidence data will be reported in a separate report

Chapter 2: Methodology

2.1. Setting

The 2022 survey like the 2017 and 2019 editions were designed to evaluate aspects of the national PMTCT programme. At the time of the survey the 2019 PMTCT guidelines were in effect (7). These guidelines recommended the following among other interventions:

- HIV prevention for all HIV negative women. Recommended methods including PrEP where applicable and available.
- HIV testing at the booking visit and at every follow up ANC visit.
- Partner HIV testing to prevent HIV infection or promote HIV care and treatment.
- ART initiation regardless of CD4 count or clinical stage for pregnant WLHIV and newly diagnosed HIV positive or those not already on ART. DTG- containing regimens were the regimen of choice among those newly initiating ART.
- ART treatment continuation at the booking visit for pregnant WLHIV already on ART at booking. If booking viral load (VL) <50 copies/ml and gestational age outside the first trimester, pregnant WLHIV were to be switched to a DTG containing regimen.
- For women newly initiated on ART, viral load was checked at three months post ART initiation. If VL<50 copies/ml, then VL was repeated at delivery. If VL was 50–999 copies/ml, pregnant woman would be offered adherence assessment, counselling and support and VL repeated 8–10 weeks later. If VL≥1 000 copies/ml, VL would be repeated 4–6 weeks later.
- For women already on ART at booking visit, viral load would be measured at booking, repeated at 3 months then at delivery if <50 copies/ml, 8–10 weeks if VL was 50–999 copies/ml or 4–6 weeks if VL≥1 000 copies/ml.
- Syphilis testing at booking and again at 32–34 weeks if booking test was negative.
- Treatment with Benzathine penicillin G (BPG) for all women with a positive syphilis test result regardless of rapid plasma reagin (RPR) titre levels (7).

2.2. Study design

The South African antenatal survey is a cross-sectional survey conducted biennially to monitor trends in HIV prevalence among pregnant women attending ANC in public health facilities. A multistage stratified cluster sampling design was used to select sentinel sites.

2.3. Sample size

The 2022 survey envisaged enrolling 36 068 pregnant women from 1 589 public health facilities from October - November 2021. However, as a result of delays due to the COVID-19 pandemic and interventions designed to prevent its spread, the implementation of the 2021 survey was delayed until February - April 2022. As in the previous surveys, the sample size determination was guided by the following two main objectives of the survey: (1) to estimate HIV prevalence within an acceptable level of precision, and (2) to measure the change in HIV prevalence over time. For the first primary objective, the calculation was performed to estimate HIV prevalence at district level with a precision level of 3–5%, with 95% confidence interval (CI), a design effect of 1.5, and a 10% error rate (for loss of specimens and data collection forms, incomplete reporting, etc.).

For the second primary objective, with the calculated sample size for the first objective, it was possible to detect the following prevalence trends over time at a 5% significance level, 80% power on a two-sided test, design effect of 1.5, and 10% error rate:

- i. A 1.3% HIV prevalence change over time at the national level
- ii. A minimum expected 3–5% change in HIV prevalence over time at the province level
- iii. A 1.6% HIV prevalence change over time among the 15–24-year age group at the national level.

2.4. Sampling of sites

The 2022 survey included all sites (except closed clinics) which were sampled and visited in the previous antenatal surveys. Sites were sampled based on geographical distribution, considering all nine provinces and 52 districts. Overall sample size calculated at district level was allocated proportionally to the following six strata: urban, semi-urban and rural clinics and small, medium and large facilities. The rural, urban and semi-urban categories were determined by geo-coordinates and information on the ward-level geographical type classification from the 2011 census conducted by Statistics South Africa (Stats SA) (8). Facilities were classified as small, medium, and large by using quantile values of the district antenatal visit volume data as proxy measure for size. Eligible sentinel sites within each stratum were selected using the Probability Proportional to Size (PPS) sampling method. Since the sampling period was the same for each facility, this produced a self-weighting sample for each district. A fixed (equal) sample size was allocated for each clinic within a stratum.

2.4.1. Inclusion and exclusion criteria for sites

Eligible facilities that took part in the 2019 survey were included in 2022. To be included as a sentinel surveillance site in the 2019 survey, the public clinic had to:

- provide pregnancy testing and ANC services.
- have a minimum of 20 first ANC-visit attendees per month.
- routinely draw blood from ANC-clients, with facilities to store sera at 4 degrees Celsius (°C).
- be able to transport biological specimens to the nearest regional laboratory within 24 hours.

In addition, the facility staff had to be willing and able to conduct the survey. Only public facilities were included.

No other criteria were applied when selecting sites: in particular, sites were not selected specifically to monitor either high-risk or low-risk subpopulations, or to monitor interventions.

2.5. Sampling of women

During the designated enrolment period, each pregnant woman visiting an ANC clinic at a sentinel site was given the opportunity to voluntarily enrol into the survey.

Inclusion criteria

- Consenting pregnant women aged 15–49 years, attending the antenatal clinic either for the first time or for follow-up visits during their current pregnancy in the survey period were eligible for inclusion, regardless of their HIV status or previous (or current) history of routine HIV test.

Exclusion criteria

- Pregnant women who previously visited the clinic during the survey period were excluded to avoid duplicate sampling. Survey barcodes were put on the medical record of survey participants to indicate their participation in the survey. This was used to identify and exclude women who already participated in the survey from being sampled twice.
- Pregnant women aged <15 years or ≥50 years.
- Women who refused to participate in the survey.

2.6. Data collection

The survey was conducted from 28 February to 8 April 2022. The data collection procedures included: written informed consent, a brief interview, medical record review and blood specimen collection. Women were offered enrolment into the survey during their routine ANC visit. The ANC nurse, after providing routine services, assessed the eligibility of subjects to participate in the survey. Baseline data on four demographic indicators were collected from each eligible woman, using the data collection form (Annexure 1): age, race, relationship with the child’s father and type of antenatal visit –first or follow–up visit. Following this, the information sheet (Annexure 2), adapted with permission from the South African Medical Research Council’s prevention of mother-to-child transmission (PMTCT) survey consent form was given to the participant to read; if necessary, the nurse would read the information sheet to the participant. The information sheet provided information on the objectives of the study, the potential benefit and harm of participating in the study, participants’ privacy, participants’ right to refuse to participate in the study without any penalty and returning of HIV test results. Nurses were trained to explain the information sheet in the language used for communication during consultation.

After giving written consent, participants were interviewed briefly, and a blood specimen was taken. For first ANC-visit attendees, the blood sample for the antenatal survey was collected at the same time as the routine blood specimen for syphilis testing. For follow-up ANC attendees, a blood sample was collected for the antenatal survey only.

2.6.1. Collection and transfer of demographic information

The attending health worker completed the form (Annexure 1) used to collect the demographic and clinical information listed in Table 1. Data were extracted from medical records where available and documented on the form. New questions added in the 2022 survey are highlighted in bold in Table 1. In 2022, eight new questions were added as follows: ARV regimen for pregnant women taking ART, four PrEP eligibility criteria (>1 sexual partner in the past 12 months, partner HIV positive/status unknown, sex under the influence of drugs in the past 6 months and having had an STI in the past 6 months, including a syphilis positive result abstracted from the records on the day of the survey), (9) knowledge of PrEP, PrEP use before pregnancy and current PrEP use.

Table 1. Data collected in the 2022 antenatal HIV sentinel survey, South Africa

Data source	Variables
Medical record review	<ul style="list-style-type: none"> • Province, district, health facility • Date of specimen collection • Age of the woman • Visit type, and gestational age

	<ul style="list-style-type: none"> • Gestational age at first booking • Routine HIV testing uptake, routine HIV test result • ART initiation, timing of ART initiation (if available from medical record, otherwise self-reported), ART regimen, most recent viral load – date and result • Maternal syphilis screening, type of syphilis test and syphilis treatment
Self-reported	<ul style="list-style-type: none"> • Race of the woman, level of education, relationship with the father of the child (with options: married, living together, in a relationship but not living together, no relationship). • Gravidity, parity, age of the father of the child • PrEP eligibility criteria - (>1 sexual partner in the past 12 months, partner HIV positive/status unknown, sex under the influence of drugs in the past 6 months and having an STI in the past 6 months, ever heard of PrEP, PrEP use prior to pregnancy and current PrEP use

Bolded variables were added to the recent survey (2022) and were not included in prior surveys

The completed data collection form was sent to the regional serology laboratory (with the specimen) where specimens were registered and transported to the HIV reference laboratory at the NICD for testing.

2.6.2. Collection and transport of blood

The clinic nurses collected 8.5 ml of whole blood into the Ethylenediaminetetraacetic acid (EDTA) tubes supplied. Each tube was labelled with a barcode, and stored at 4°C. At the close of each day, the supervisors checked the forms against the blood samples for completeness and possible mismatches. The NICD and National Health Laboratory Service (NHLS) were responsible for coordinating and facilitating the transport of specimens by routine courier from the sentinel sites to the designated survey laboratories. The samples were transported in cooler boxes maintained at 4–8°C, with the temperature continuously monitored by trackers.

2.7. Laboratory methods

2.7.1. Specimen testing for HIV

At the NICD Centre for HIV and STI seromolecular laboratory, standardised HIV testing strategies, as outlined in the national HIV testing guideline, were used (10). Two fourth-generation HIV-1 enzyme immunoassays were used to test for HIV infection, following the manufacturers' instructions – including appropriate quality control specimens. All plasma samples were tested using the first enzyme-linked immunosorbent assay [EIA 1, Abbott Architect HIV Ag-Ab Combo Assay (Abbott, Wiesbaden, Germany)]. Specimens that tested negative on the first EIA were classified as negative. All samples that tested reactive using EIA 1 were re-tested using a second and different EIA (EIA 2- Diasorin Murex HIV Ag/Ab Combination Assay (DiaSorin, Dartford, United Kingdom)]. If EIA 1 and EIA 2 were in agreement, the result was classified as “HIV-positive”. If EIA 1 and EIA 2 were not in agreement, the result was recorded as “discrepant”. The specimen information, including EIA 1 and EIA 2 results, was captured in an electronic lab information system called TrakCare.

The final HIV test results were returned to participants if they were unaware of their HIV status or if there was a discrepancy between the results of the survey-provided laboratory test and the routine clinic test. During data collection, the name of the participant, cell phone number and barcode were collected in a separate confidential register that stayed at the antenatal clinic. The antenatal nurse used the cell phone number of participants to contact and return results of participants with the discordant result and those who missed routine HIV testing. The identifying information documented on the register was used to link HIV test results returned from the laboratory with participants' files.

2.7.2. Laboratory quality assurance

The NICD was responsible for monitoring key laboratory performance indicators against specific targets. The NICD laboratory is SANAS-accredited (South African National Accreditation System), based on ISO15189-2012.

2.8. Training and survey monitoring

Before the scheduled commencement of the survey, one-day online training sessions were each held at national level, in all nine provincial health offices and at district level. The national training was organised by the NICD and G:ENESIS Analytics (contracted service provider) and was attended by provincial HIV and AIDS coordinators, laboratory personnel, and representatives from the district health administration. The training session was recorded and made available on YouTube for additional and refresher trainings in the districts and facilities. Provincial and District Department of Health offices were responsible for coordinating the provincial and district-level training sessions (including funding, logistics and training). Healthcare providers were responsible for undertaking further orientation at their respective facilities for midwives, nurses, and other staff who were directly involved in the survey. The training covered: criteria for selection of the sites; screening and recruitment of pregnant women; data administration; blood sample collection; labelling, coding, and storage of samples; sample transportation; laboratory testing for HIV; return of results; handling of discordant results; confidentiality and ethical issues; supervision and quality assurance procedures; and standard laboratory operating procedures.

2.8.1. Technical support and quality control visits during survey execution

Provincial and District Department of Health offices with support from G:ENESIS Analytics organised and managed all survey monitoring activities. Personnel from the district health offices conducted site visits. In some provinces, provincial survey teams joined site visits. Weekly clinic-level survey progress reports were produced by the NICD team which were used by provincial survey coordinators to monitor and improve survey progress. One data clerk was recruited at each designated laboratory to perform data quality checks on completed data collection forms. Identified data quality gaps were reported to the central data quality manager who provided daily feedback to provincial survey coordinators on the identified data quality gaps. The NICD lab team conducted site visits to the designated labs to discuss and assist in identifying solutions for identified challenges during the survey. Personnel from G:ENESIS Analytics provided telephonic and messaging support to provincial survey coordinators and facility staff during survey implementation.

2.9. Data management

Data collected on paper (the data collection forms) were scanned (converted into an electronic database) by data clerks at NICD using optical mark recognition (OMR) software. The electronic database was uploaded on the NICD server and data were exported directly to STATA14.2 (Stata Corporation. *Stata Statistical Software: Release 14*. College Station, TX: Stata Corporation LP) for data cleaning and analysis.

All EIA screening and confirmatory test results were exported from TrakCare (the NHLS electronic laboratory information system) to Excel. The laboratory data exported to Excel were then merged using the barcode number (unique participant identifier) with the interview data extracted from the NICD server using STATA 14.2. Queries such as missing laboratory data and missing data collection forms were sent to the staff responsible at NICD and National Department of Health (NDoH), i.e., laboratory managers and provincial coordinators respectively, and data were cleaned. The final database excluded observations for participants outside the age range of 15–49 years, those with missing age, those with no interview data, rejected or lost specimens and those with equivocal or unconfirmed HIV test results. Anonymous data were shared with South African Medical Research Council (SAMRC) and with Centers for Disease Control and Prevention (CDC) for parallel data analysis. Data will be stored for future use at NICD on a password-protected computer and backed up on a server, with access restricted (anonymised data related to each article/report) to those who analyse the data.

2.10. Data analysis

Data were analysed using STATA 14.2[®] [Stata Corporation, College Station, USA] at the NICD office, collaborating with statisticians from the SAMRC. A working group composed of NICD and SAMRC reviewed the technical aspects of the data analysis and outputs. The analysis considered the survey design (clustering within primary sampling units – PSUs, and stratification by district) and was 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 province level (11). The surveys before 2022 (i.e., 1990–2019) were weighted for the mid-year population size of reproductive age (15–49 years) women in the respective years using Statistics South Africa. Given that sites were sampled using PPS, and that the sampling period was fixed, this provided a self-weighted sample at district level). A population finite correction factor was added, to adjust for the >5% of PSUs sampled without replacement from a finite population of about 4 000 public facilities.

Descriptive analyses included a summary of sample size realisation and distribution of participants by district, province, nationally, and by age, gravidity, race group, and visit type (first or follow-up ANC visit). Median and interquartile ranges (IQR) were reported for continuous variables, while frequencies and proportions were reported for categorical variables. The primary outcome of the survey was HIV prevalence: defined as the proportion of eligible pregnant women who participated in the survey with a positive HIV EIA test. Descriptive analysis provided HIV prevalence at national, provincial and district levels, by age group (5-year age bands, and the 15–24 years category) and visit type (first or follow-up ANC visit). HIV prevalence was compared across provinces and districts, and by visit type, with *P* values from chi-square tests and trend analysis reported for statistically significant differences.

The HIV prevalence trend for 2012–2022 (excluding 2015) was analysed by 5-year age band and by province. This analysis was restricted to first ANC-visit attendees, because the

inclusion of follow-up visit attendees was expected to result in a slight increase in overall HIV prevalence, owing to new HIV infections acquired during pregnancy. The 2015 survey was excluded from this trend analysis, as the women enrolled were not identified by visit type¹. A separate analysis compared HIV prevalence among all pregnant women for 2015, 2017, 2019 and 2022 by province and district. For all prevalence estimates, 95% CIs are reported.

The PMTCT cascade analysis included: uptake of HIV testing, knowledge of HIV-positive status, ART coverage (2nd 95) and viral suppression (3rd 95). Knowledge of HIV-positive status and ART initiation before pregnancy was estimated, in order to assess the coverage of ART in women of reproductive age group in the general population in the test and treat era. The denominator for knowledge of HIV-positive status prior to pregnancy was the number of EIA positive individuals. Of those who knew their HIV-positive status prior to pregnancy, the proportion who were initiated on ART prior to pregnancy was reported.

The percentage of women taking a DTG containing regimen was determined as the number of HIV-positive women recorded as having been on a DTG containing regimen at enrolment divided by the number of HIV-positive women taking ART.

The percent positive agreement (PPA) was determined as the proportion of EIA-positive women who were HIV-positive based on record reviews while percent negative agreement was defined as the proportion of EIA-negative women who were HIV-negative based on record reviews. Women who had no rapid HIV results in the medical records but were documented to be HIV-positive before the survey with evidence of ART use were assumed to be HIV-positive.

The percentage of women who received maternal syphilis screening during ANC was determined as the number of pregnant women who had a documented syphilis screen in their medical record, regardless of the timing of the screen, divided by the number of eligible pregnant women included in the analysis. The proportion who were positive for syphilis (syphilis prevalence) was determined as the number who had a positive result divided by the number who had a documented screen and had a documented result on record. The proportion of those who received treatment for syphilis was determined as the number who received treatment divided by the number who had a documented screen for syphilis and had positive syphilis test results. Benzathine penicillin G (BPG) is the primary treatment indicated for maternal syphilis and the prevention of vertical transmission of syphilis (MTCTs) with one dose considered to be sufficient to prevent MTCTs.

The percentage of women eligible for PrEP was determined as the number of HIV-negative women with an HIV-positive partner or whose partner has an unknown HIV status OR reported multiple sexual partners in the 12 months preceding enrolment OR reported treatment for an STI/ STI syndrome in the preceding 6 month OR reported having sex under the influence of alcohol or drugs in past 6 months divided by number of pregnant women with a negative EIA test at enrolment.

The percentage of women taking PrEP was determined as the number of PrEP eligible, HIV-negative pregnant women who reported taking PrEP before or during pregnancy divided by the number of PrEP eligible women as determined above.

Early ANC attendance was defined as attendance of ANC at or before 12 weeks of pregnancy per the WHO recommendation. We also looked at the attendance of ANC before 20 weeks

¹ In the 2015 survey, although both first-ANC-visit and follow-up attendees were included, the data needed to be identified by visit type (i.e. on which visit each participant was tested was unknown). In the 2017 and 2019 survey determined the data by visit type (as 1st, 2nd, 3rd and 4+ ANC visits).

as this definition is still being used in the NDoH annual reports despite the guideline change (12).

Each analysis used complete observations, excluding individuals with missing values. The non-response rate was low ($\leq 5\%$) for most variables. Six variables had $>5\%$ missing values, which were HIV rapid test result (8.7%), visit type (5.5%), syphilis results (11.5%), syphilis test type (8.3%) and the name of the syphilis medication received (10.8%). For participant age, the age variable was also included on the specimen request form and was used when available and if the age variable was missing on the questionnaire. As a result, age was only missing for 1.8% of the collected data. For routine rapid HIV test, laboratory based HIV test results (EIA test) showed participants with missing rapid test data had similar HIV prevalence as those with complete rapid HIV test results, meaning the rapid HIV test results were not biased by HIV status. For syphilis screening, syphilis result and treatment, the distribution of the missing data did not vary by province, age group or HIV status. The demographic and clinical characteristics of participants whose samples were rejected were compared to those whose samples were processed to assess potential bias introduced due to the exclusion of participants with rejected samples.

2.11. Ethical considerations

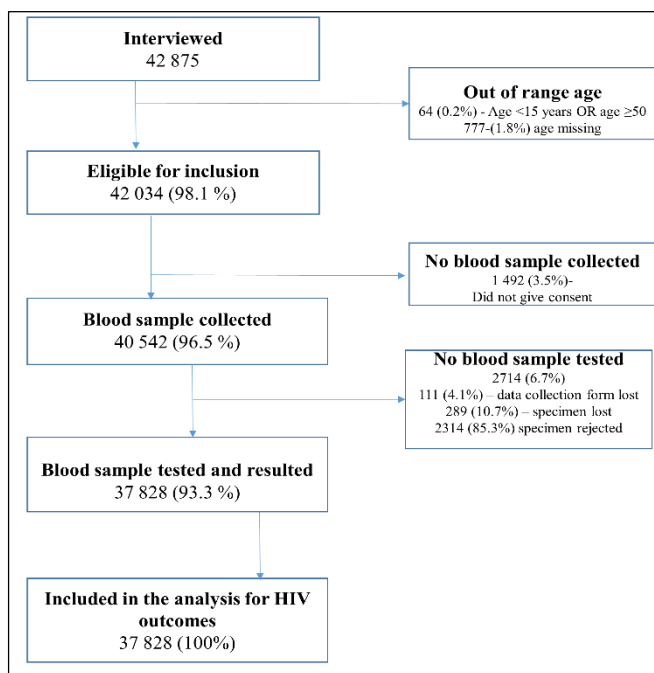
Participation in the survey was voluntary, requiring written informed consent. The data collection form and the blood specimens were submitted without patient identification to protect the confidentiality of participants. Participants could withdraw from the study at any time, and this which did not influence their access to ANC services. Participants were not compensated for their participation. Ethical approval was obtained from the University of the Witwatersrand Human Research Ethics Committee (Medical), and the nine provincial health research ethics committees. This project was reviewed in accordance with CDC human research protection procedures and was determined to be research, but CDC investigators did not interact with human subjects or have access to identifiable data or specimens for research purposes.

Chapter 3: Results

3.1. Flow chart of participants included in the analysis

In total, 42 875 participants were interviewed. Sixty-four (0.2%) participants fell out of the age range (15–49 years) for inclusion in the study, while 777 (1.8 %) participants were missing data on age. A further 1 492 (3.5%) were excluded as they did not provide consent to participate in the survey. A further 2 714 (6.7%) were not tested for HIV because: i) 111 (4.1%) had a lost questionnaire, ii) 289 (10.6%) had a lost specimen, and iii) 2 314 (85.3%) had their blood specimens rejected (with 90.8% of specimen rejections due to haemolysis). Of the remaining 37 828 women who had specimens processed, all were included in the final sample for analysis (Figure 1).

Of the 2 714 specimens which were rejected in the laboratory, 36.5% of specimen rejections were from the North West; 25.8% in Mpumalanga; 12.1% from KwaZulu- Natal; 9.7% were from Eastern Cape; 7.8% from Limpopo; 2.6% from Gauteng; 2.5% from Western Cape; 1.9% from Free State; and 1.2% from Northern Cape. There was no substantial difference in demographic and clinical characteristics (i.e., age, marital status, visit type and HIV status) between participants whose samples were rejected and participants whose samples were processed. Delays in the transportation of specimens, breakdown in the cold chain during transportation, and high workload at the designated labs contributed to the haemolysis of samples.



OR: Odds Ratio; HIV: Human Immunodeficiency Virus. All percentages are based on the total number of women interviewed; all percentages are unweighted

Figure 1: Flow chart of women assessed for eligibility and enrolled in the 2022 Antenatal HIV Sentinel Survey, South Africa

3.1.1. Sample size realisation at the national and provincial level

At the national level 105% of the planned sample size was achieved (Table 2). All provinces with the exception of North West province, achieved at least 95% of their target. Sample size achievement was also high at the district and clinic levels. All districts and 90% of clinics achieved at least 80% of their sample size. Three clinics – one each in Free State, Gauteng and Mpumalanga did not contribute any data due to laboratory rejections of specimens, despite enrolling some clients.

Table 2. Sample size realisation by province, Antenatal HIV Sentinel Survey, South Africa, 2015–2022.

Province	2015 sample size achieved		2017 Sample size achieved		2019 Sample size achieved		2022 Sample achieved		% realized
	N	%	N	%	N	%	N	%	
Eastern Cape	4 168	11.5	4 040	12.3	5 692	15.3	5 226	13.8	97.9
Free State	2 349	6.5	2 734	8.4	2 851	7.7	2 838	7.5	103.9
Gauteng	6 512	18.0	4 844	14.8	5 375	14.5	5 598	14.8	117.9
KwaZulu–Natal	6 819	18.9	8 242	25.2	8 430	22.7	9 201	24.3	105.2
Limpopo	3 482	9.6	2 647	8.1	3 053	8.2	3 290	8.7	103.9
Mpumalanga	2 162	6.0	2 870	8.8	3 186	8.6	3 366	8.9	113.6
North West	1 880	5.2	2 256	6.9	2 901	7.8	2 619	6.9	85.5
Northern Cape	1 238	3.4	1 512	4.6	1 685	4.5	1 642	4.3	98.6
Western Cape	7 517	20.8	3 571	10.9	3 943	10.6	4 048	10.7	111.2
Total	36 127	100	32 716	100	37 116	100	37 828	100	104.9

All percentages are unweighted

3.2. Characteristics of survey participants

Most participants were Black African (88.2%) and had attended at least secondary school (87.9%). About a sixth (16.0%) of participants were married to the father of the child, 27.1% were living together with the father of the child, 52.5% were in a relationship with the father of the child but were non-cohabiting and 3.6% had no relationship with the father of the child at the time of the survey. Just under one-third of participants (32.5%) reported that the current pregnancy was their first. The median gestational age of participants (at the time of the survey) was 17.0 weeks (IQR: 12.0 – 23.0 weeks) for first ANC–visit attendees and 30.0 weeks (IQR: 24.0 – 34.0 weeks) for follow–up visit attendees. At the provincial level, the percentage of women in a non–cohabiting relationship significantly varied ranging between 38.4% in Western Cape Province to 73.7% in KwaZulu–Natal Province. KwaZulu–Natal Province had the lowest percentage of married women at 7.5% while Western Cape Province had the highest percentage of married women at 26.4%. More than 88.0% of participants were Black African in seven of the nine provinces. In two provinces – Northern Cape and Western Cape – 51.3% and 43.4%, respectively, were Black African, and 42.4% and 47.7% of participants were Coloured. Distribution of other characteristics such as education, age and gravidity did not vary substantially by province. A more detailed description of the sample is included in Appendix 3.

The median age of participants was 26 years (IQR: 22 – 32 years). The proportion of pregnant younger women (15 – 19 years) participating in the survey declined by 2.3% points between 2017 and 2022. This declining trend in adolescent women participating in the survey has been consistently observed since 2013 (Table 3).

Table 3. Distribution of survey participants by five-year age group, 2013– 2022, National Antenatal HIV Sentinel Survey, South Africa.

Age group (years)	2013		2014		2015		2017*		2019*		2022*	
	N	%	N	%	N	%	N	%	N	%	N	%
15–19	5 735	17.5	5 400	16.8	4 301	14.3	5 587	15.5	4 482	13.1	4 989	13.2
20–24	9 901	30.2	9 548	29.6	8 666	28.9	10 518	29.1	9 515	27.8	9 969	26.4
25–29	8 289	25.3	8 125	25.2	8 012	26.7	9 416	26.1	9 136	26.6	9 913	26.2
30–34	5 396	16.4	5 469	17.0	5 598	18.6	6 455	17.9	6 772	19.8	7 572	20.0
35–39	2 662	8.1	2 788	8.7	2 750	9.2	3 218	8.9	3 506	10.2	4 289	11.3
40–44	768	2.3	830	2.6	672	2.2	871	2.4	801	2.3	1 036	2.7
45–49	62	0.2	55	0.2	32	0.1	62	0.2	69	0.2	60	0.2
Total	32 813	100	32 215	100	30 031	100	36 127	100	34 281	100	37 828	100.0

*Total excludes missing age data (in 2017, 2019, and in 2022, age data were missing for 8.2%, 7.6% and 1.8% of participants, respectively.). All percentages are unweighted

Between 2017 and 2022, the number of first ANC-visit attendees participating in the survey declined (37.7% in 2017 vs. 29.7% in 2022), whereas the number of follow-up visit attendees increased (60.8% in 2017 vs. 68.0% in 2022) and those whose visit type was not documented (1.5% in 2017 vs. 2.3% in 2022) increased across all provinces (Table 4).

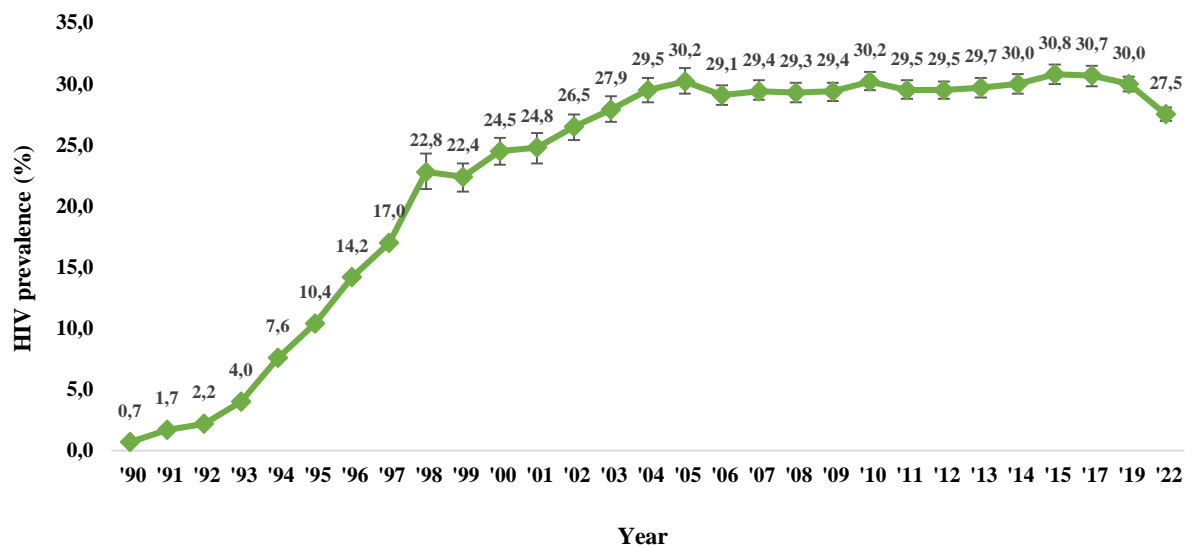
Table 4. National sample size distribution by visit type, 2022, National Antenatal HIV Sentinel Survey, South Africa.

Province	1 st ANC visit		Follow up ANC visit		Undocumented ANC visit		Total	
	N	%	N	%	N	%	N	%
Eastern Cape	1 574	30.1	3 570	68.3	82	1.6	5 226	100
Free State	7 84	27.6	2 001	70.5	82	1.9	2 838	100
Gauteng	2 096	37.4	3 352	59.9	150	2.7	5 598	100
KwaZulu-Natal	2 383	25.9	6 594	71.7	224	2.4	9 201	100
Limpopo	989	30.1	2 231	67.8	70	2.1	3 290	100
Mpumalanga	940	27.9	2 346	69.7	80	2.4	3 366	100
North West	824	31.5	1 710	65.3	85	3.3	2 619	100
Northern Cape	471	28.7	1 128	68.7	43	2.6	1 642	100
Western Cape	1 180	29.2	2 784	68.8	84	2.1	4 048	100
All	11 241	29.7	25 716	68.0	871	2.3	37 828	100

All percentages are unweighted

3.3. National HIV prevalence

The overall HIV prevalence at the national level was 27.5% (95% CI: 27.0 – 28.1) (Figure 2). This figure was lower by 2.5% points from the prevalence reported in 2019 (30.0%, 95% CI: 29.4 – 30.6).

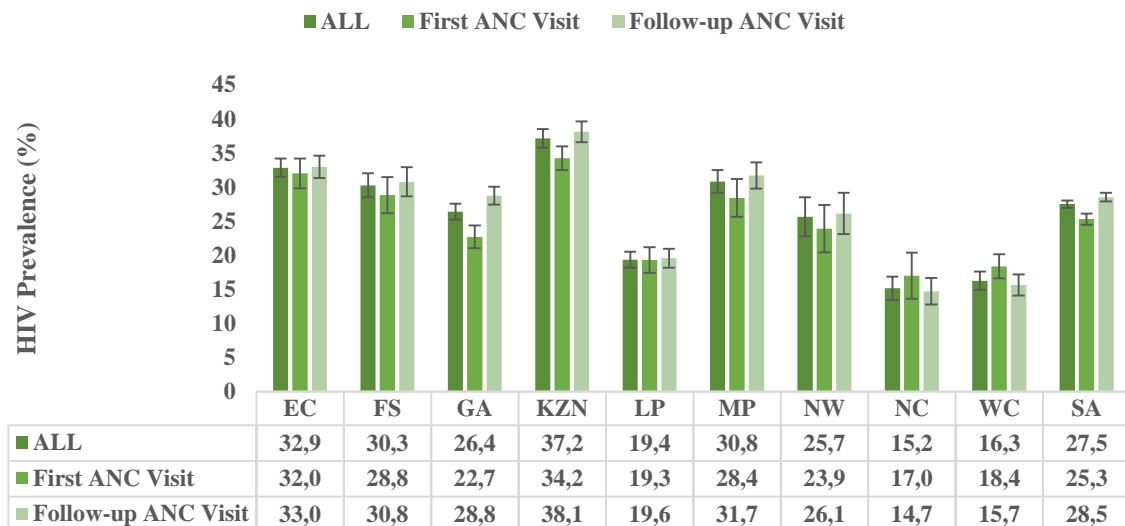


**Both first-ANC-visit attendees and follow-up visit attendees were included in the 2015, 2017, 2019 and 2022 surveys*

Figure 2: The HIV epidemic curve among antenatal women, South Africa, 1990 – 2022 Antenatal HIV Sentinel Survey, South Africa

3.3.1. HIV prevalence by province

The highest overall HIV prevalence was in KwaZulu-Natal Province (37.1%, 95% CI: 35.8 – 38.5) followed by Eastern Cape Province (32.9%, 95% CI: 31.5 – 34.2) (Figure 3). The lowest overall HIV prevalence was in Western Cape Province at 16.3% (95% CI: 15.0 – 17.6). Nationally and in two provinces (Gauteng and KwaZulu-Natal) participants attending follow-up ANC visit had significantly higher HIV prevalence (P value <0.01) compared to participants attending first ANC-visit. This result was consistent with the 2019 survey result which also showed higher HIV prevalence among follow-up visit attendees compared to first ANC-visit attendees particularly in Gauteng, Limpopo, and Mpumalanga provinces.



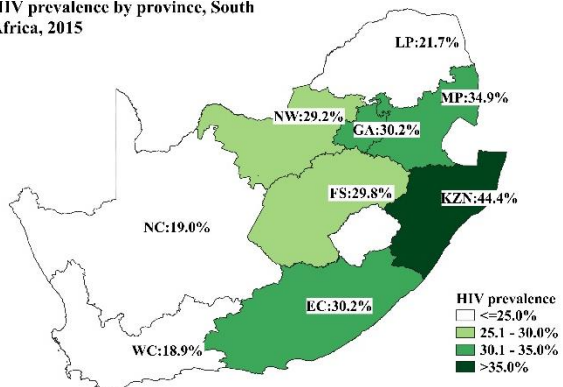
ANC: antenatal care; EC: Eastern Cape; FS: Free State; GP: Gauteng; KZN: KwaZulu-Natal; LP: Limpopo; MP: Mpumalanga; NW: North West; NC: Northern Cape; WC: Western Cape; SA: South Africa

Figure 3: HIV prevalence among overall ANC visit attendees, first-ANC visit attendees, and follow-up ANC visit attendees by province in the 2022 Antenatal HIV Sentinel Survey, South Africa

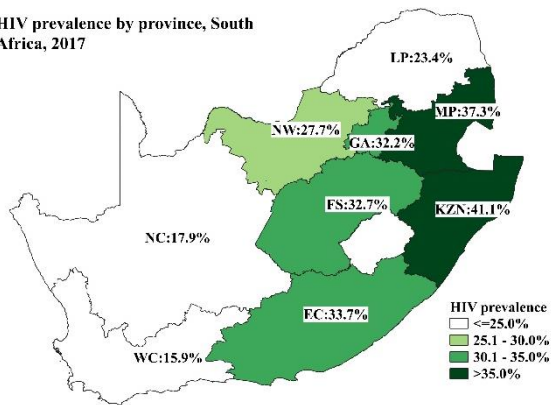
3.3.1. HIV prevalence trends by province

In the overall data (i.e., data that included both first ANC and follow-up ANC visit attendees), between 2019 and 2022, the highest decline in HIV prevalence was observed in Northern Cape (5.0% points) followed by Eastern Cape (3.6% points) and KwaZulu-Natal (3.7% points) provinces respectively (Figure 4).

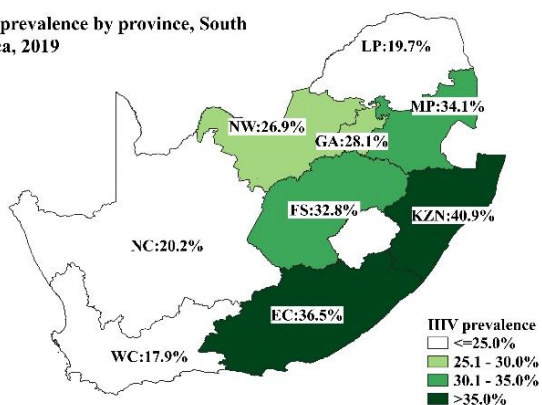
HIV prevalence by province, South Africa, 2015



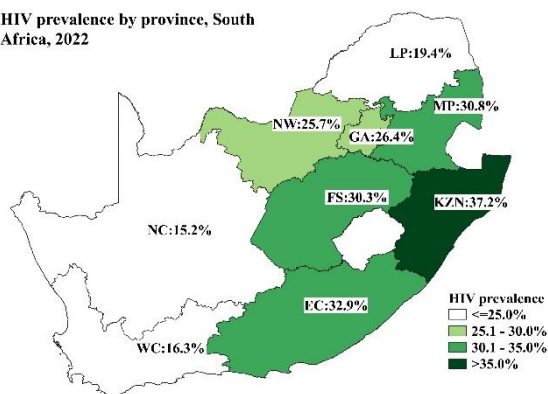
HIV prevalence by province, South Africa, 2017



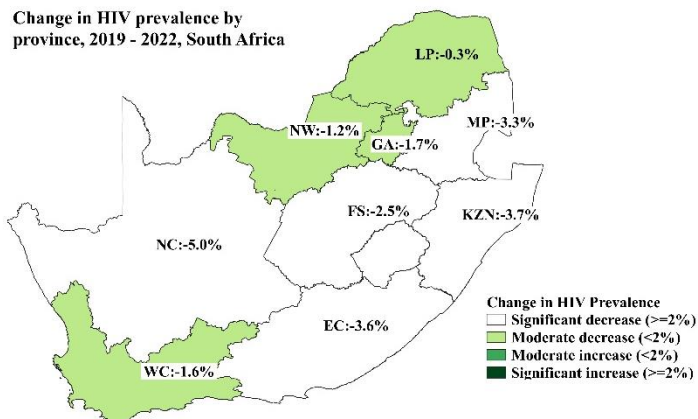
HIV prevalence by province, South Africa, 2019



HIV prevalence by province, South Africa, 2022



Change in HIV prevalence by province, 2019 - 2022, South Africa



HIV prevalence decline (or increase) of $\geq 2\%$ / $< 2\%$ refers to a drop (or increase) of HIV prevalence by 2% points.

EC: Eastern Cape; FS: Free State; GP: Gauteng; KZN: KwaZulu-Natal; LP: Limpopo; MP: Mpumalanga; NW: North West; NC: Northern Cape; WC: Western Cape; SA: South Africa

95% CI for the 2022 prevalence: EC: 31.5–34.2; FS: 28.6–32.0; GP: 25.83–27.6; KZN: 35.9–38.5; LP: 18.34–20.6; MP: 29.3–32.6; NC: 13.6–16.9; NW: 23.1–28.6; WC: 15.0–17.6

Figure 4: Overall HIV prevalence (2015–2022) and change in provincial HIV prevalence estimates (2019–2022), antenatal HIV sentinel survey, South Africa

Among first ANC-visit attendees, at the province level, there were no statistically significant changes in HIV prevalence between 2012 and 2022 (Figure 5). In the same population,

decreases in HIV prevalence were observed in Gauteng and Mpumalanga provinces while there were fluctuating in the other provinces.

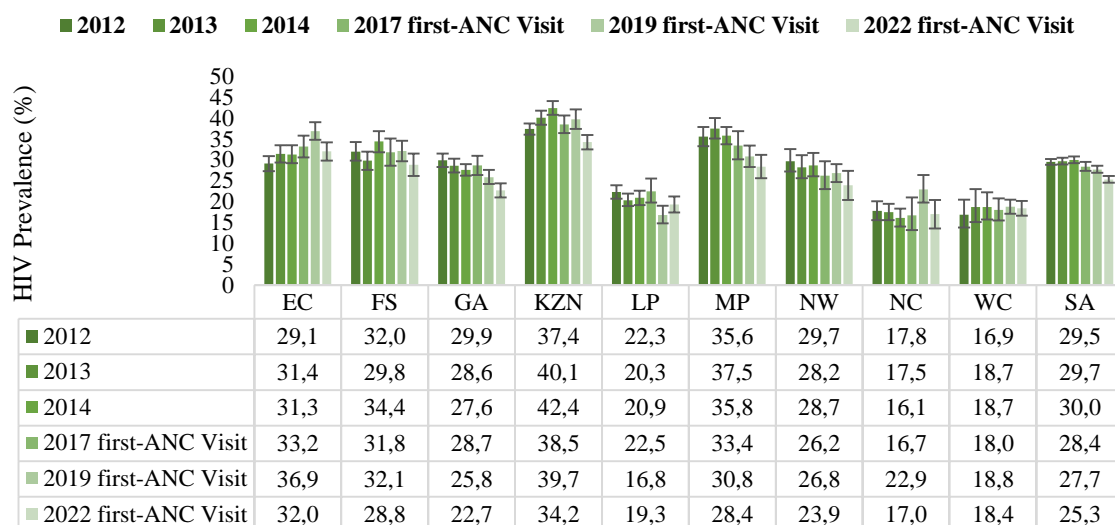


Figure 5: HIV prevalence trend among first ANC–visit attendees by province (2012-2022), Antenatal HIV Sentinel Survey, South Africa

3.3.2. HIV prevalence trend by age

HIV prevalence among the 15–24 years age group continued to show a steady decline. This was apparent among the 15–19 years and 20–24 years age groups (Figure 6).

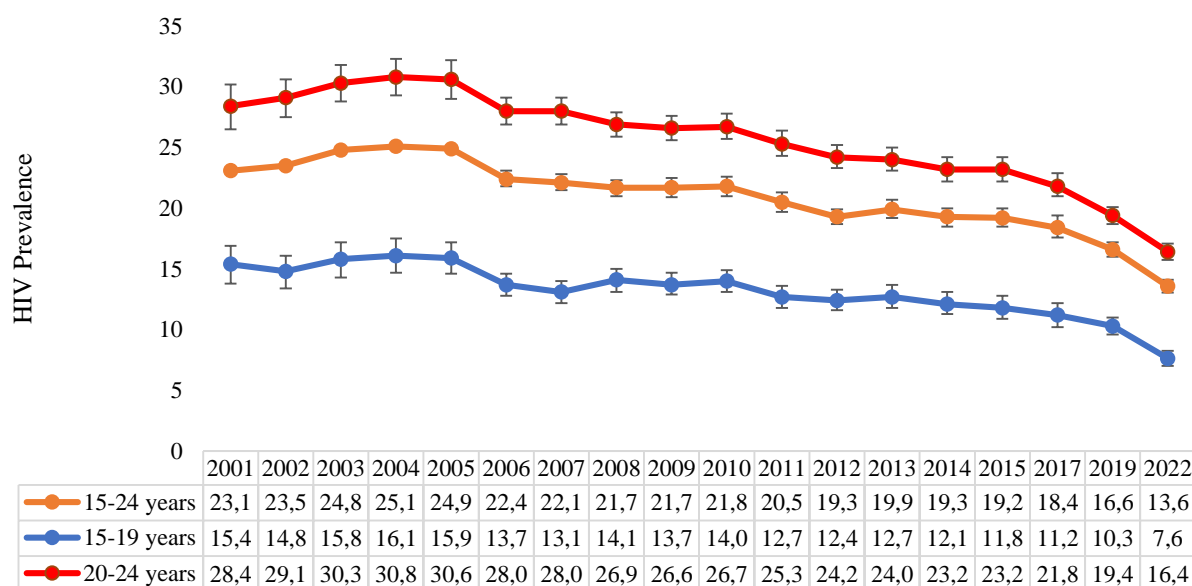


Figure 6: HIV prevalence trend by age group among 15–24-year-old women at national level (2001-2022), Antenatal HIV Sentinel Survey, South Africa

HIV prevalence among first ANC-visit attendees in the age groups 15–24 years, 15–19 years and 20–24 years also showed consistent but modest decline between 2014 and 2022 (Figure 7).

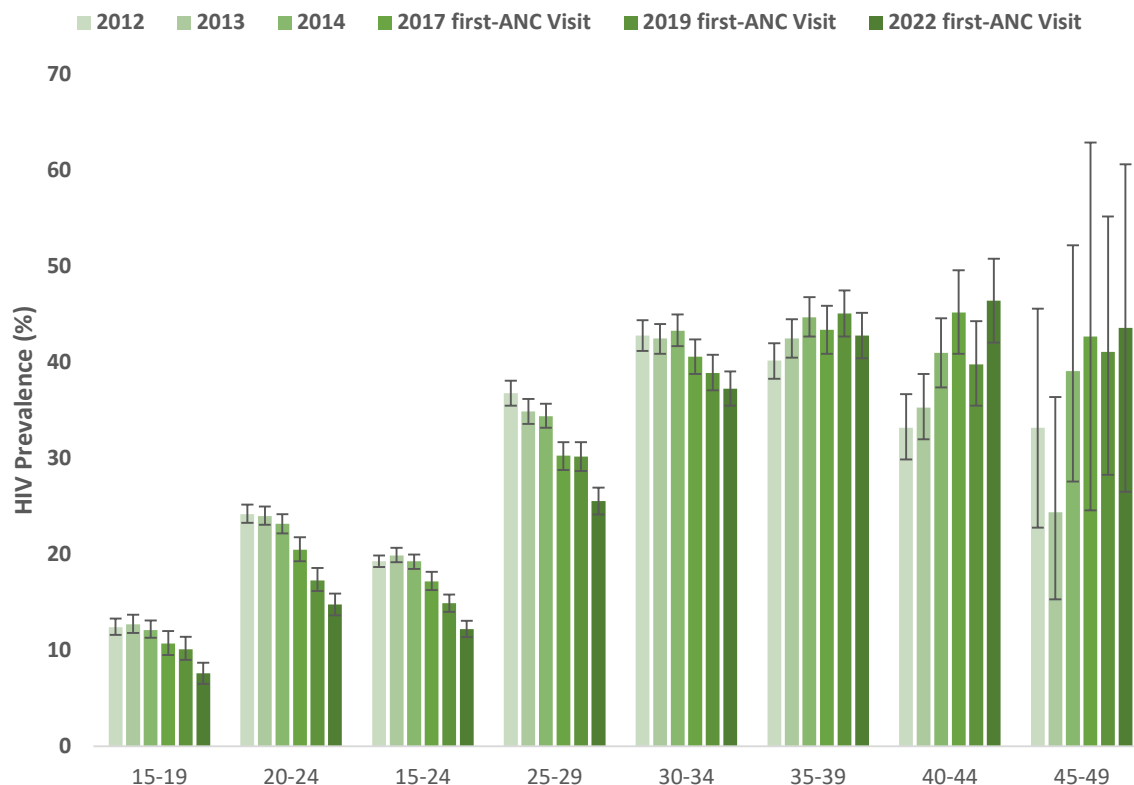
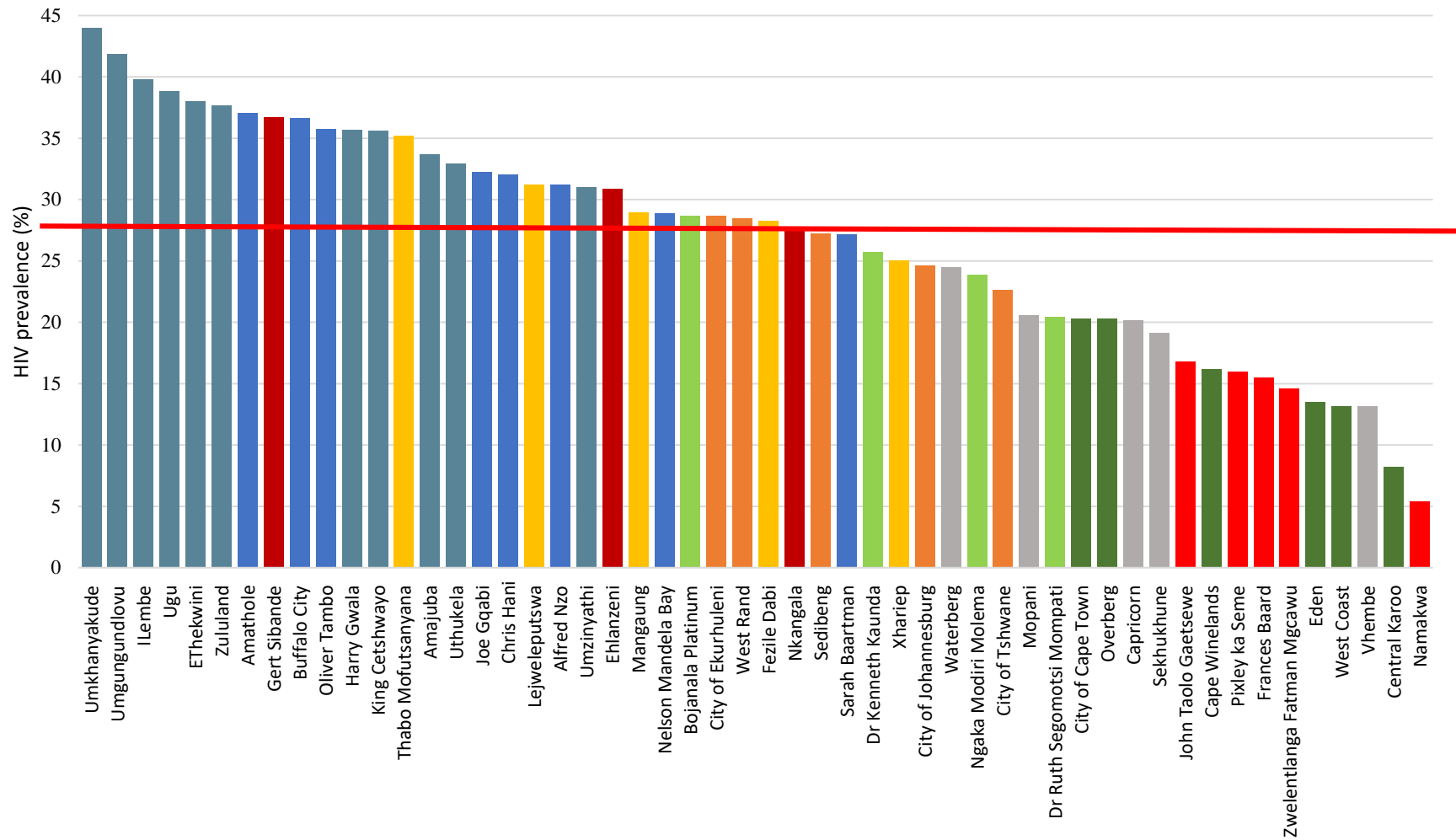


Figure 7: National HIV prevalence trend by age group among first ANC-visit attendees, 2012–2022, Antenatal HIV Sentinel Survey, South Africa

3.3.3. HIV prevalence by district

The highest HIV prevalence was reported in uMkhanyakude district at 44.0% (95%CI: 37.6 – 50.6). There were 27 districts whose HIV prevalence was higher than the national average. Seven of the ten districts that had the highest high-prevalence districts were in KwaZulu-Natal Province. The other three were in Eastern Cape (Amathole and Buffalo City) and Mpumalanga (Gert Sebande) provinces (Figure 8). The highest decline in HIV prevalence between 2019 and 2022 was in Chris Hani (11.1%) and Amajuba (9.4%) districts (Figure 9). Only nine districts had an increase in HIV prevalence. These districts were in Eastern Cape (1), Free State (1), KwaZulu-Natal (2), Limpopo (2), Northern Cape (1), North West (1) and Western Cape provinces (1).



The red line indicates the national HIV prevalence (27.5%)

Figure 8: HIV prevalence among pregnant women by district (2022), Antenatal HIV Sentinel Survey, South Africa

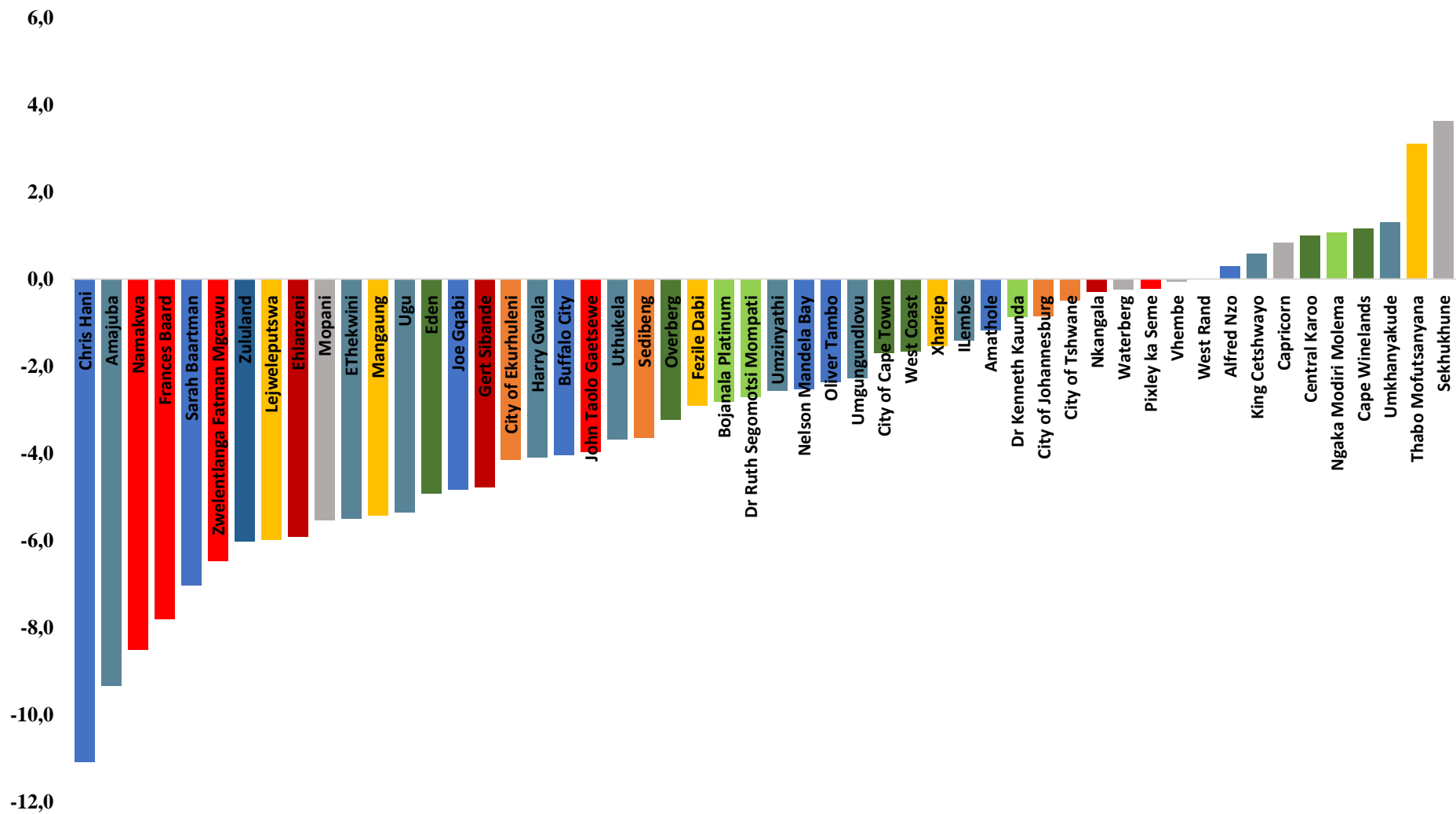
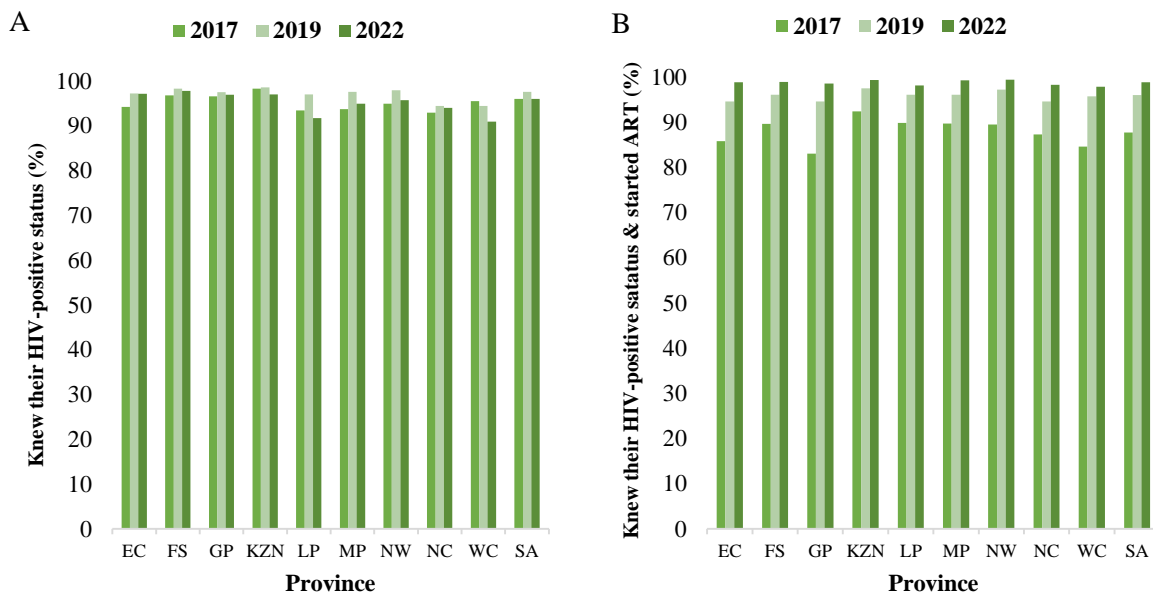


Figure 9: Change in HIV prevalence from 2019 to 2022 by district, Antenatal HIV Sentinel Survey, South Africa

3.4. PMTCT cascade – the first and second 95

Based on medical record review data, HIV testing was offered to 99.9%² (35 498) of ANC attendees as part of routine care and almost all (99.97%, 34 982) either accepted the offer or already knew their HIV-positive status. Nationally, of 10 726 participants found to be HIV-positive by EIA test, 96.0% (10 300) already knew their HIV-positive status at the time of the survey. Of those who knew their HIV-positive status, excluding 133 participants whose treatment status was not reported, 98.8% (10 166) had been initiated on ART at the time of the survey (Figure 10). At a provincial level, the proportion of those who already knew their HIV-positive status ranged from 90.9% (Western Cape) to 97.8% (Free State). ART initiation among those who knew their HIV-positive status was the lowest in Western Cape (97.8%) and highest in North West (99.4%). The proportion of EIA-positive participants who knew their status and were on ART was slightly higher in the 2022 survey compared to the 2019 survey (98.8% vs 96%).



The denominator was the total number of women tested positive by EIA test. Missing data excluded

The denominator was the total number of women who knew their HIV-positive status. Missing data excluded. ART: Antiretroviral therapy.

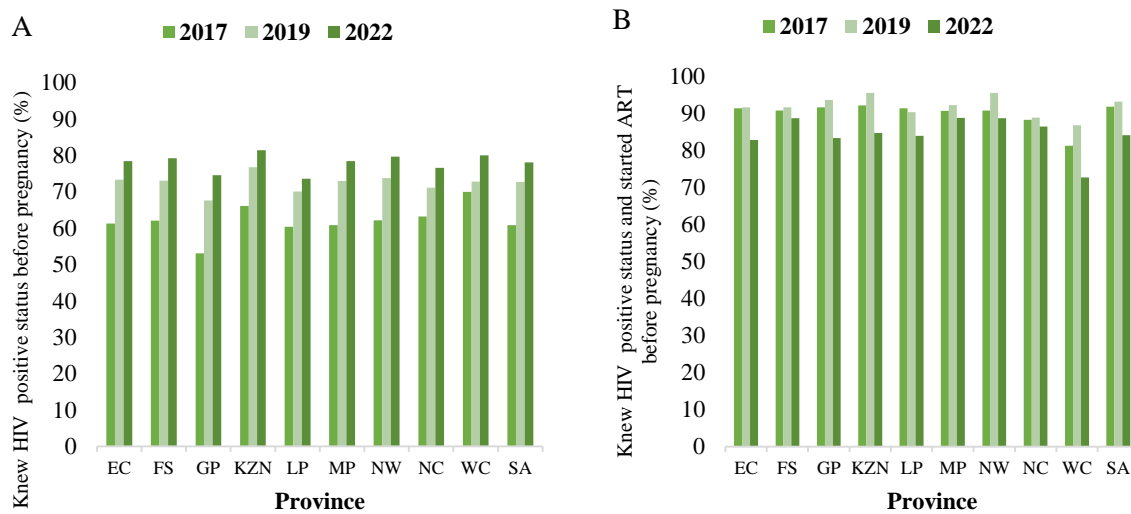
Figure 10: Knowledge of HIV-positive status (A) and ART initiation (B) by province, in the 2017, 2019 and 2022 Antenatal HIV Sentinel Survey, South Africa

3.5. Knowledge of HIV-positive status and ART initiation prior to pregnancy

Nationally, of 10 300 EIA positive participants whose timing of (HIV) diagnosis was reported, 78.1% (7 957) knew their HIV-positive status prior to current pregnancy (Figure 11). Of those who knew their HIV-positive status prior to current pregnancy and whose treatment status was reported (7 296), 6 173 (84.2%) were initiated on ART prior to pregnancy. This translates to 76.5 % of all EIA positive participants who had already initiated ART prior to pregnancy. Knowledge of HIV-positive status prior to pregnancy significantly

²3 608 (9.7%) missing response excluded when calculating percentage

improved by 17.3% between 2017 (60.8%, 95% CI: 59.9 – 61.7) and 2022 (78.1%, 95% CI: 77.3 – 78.8) while initiation of ART prior to current pregnancy decreased significantly between 2017 and 2022 (91.9% vs 84.2%).

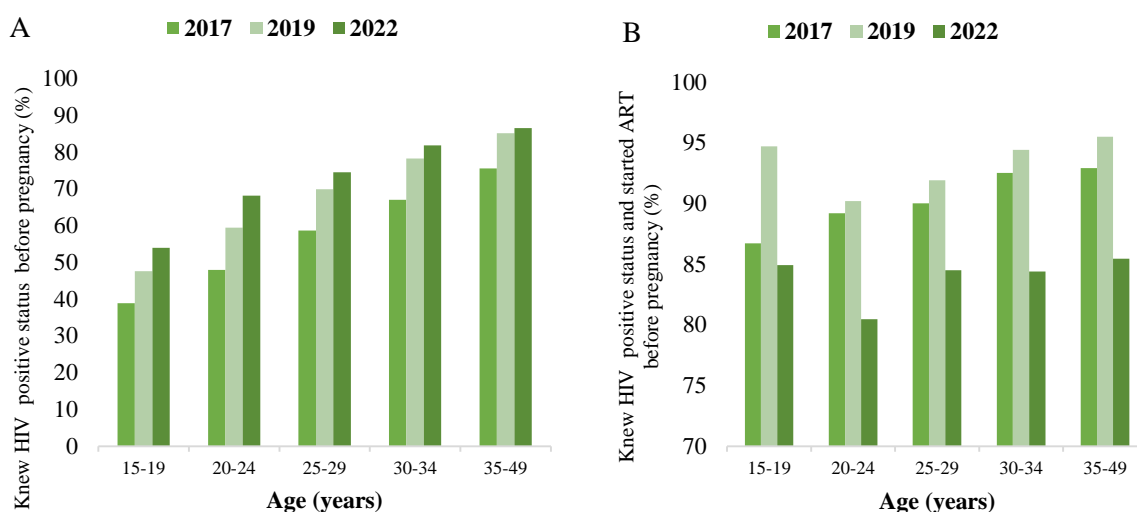


The denominator for knowledge of HIV-positive status before pregnancy was EIA positive participants. Missing data excluded.

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 11: 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

As in the 2017 and 2019 survey, in 2022, knowledge of HIV status prior to pregnancy was significantly lower among younger women (15–19 years: 53.9%, 20–24 years: 68.1%, 25–29 years: 74.5%, and 30–34 years: 81.8%) compared to older women (35–49 years: 86.5%, P value <0.01). However, there was an overall improvement across all age groups, in knowledge of HIV-positive status prior to pregnancy between 2019 and 2022 (Figure 12). ART initiation among those who had knowledge of HIV status prior to pregnancy was significantly (P value = 0.000) lower among women of 20–24 years (80.5%) compared to women who are 35–49 years (85.4%).



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 12: Knowledge of HIV-positive status (A) and ART initiation (B) prior to pregnancy by age group, in the 2017, 2019 and 2022 Antenatal HIV Sentinel Survey, South Africa

3.6. HIV status agreement between routine programme data and the ANC survey overall and by province

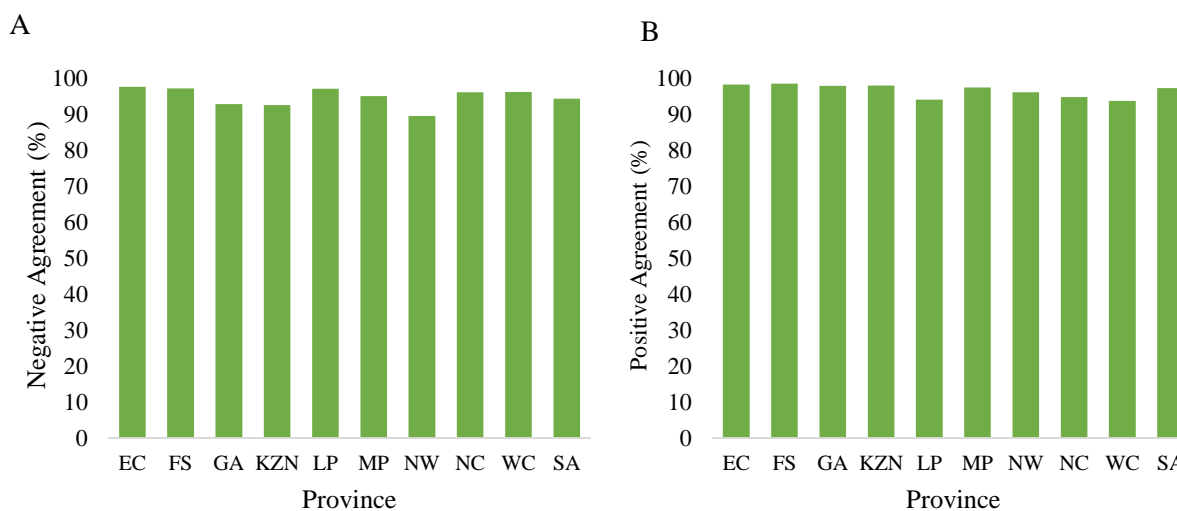


Figure 13: HIV status agreement between routine programme data (medical records) and antenatal survey (EIA testing) of negative (A) and (B) positive HIV test results, 2022 Antenatal HIV Sentinel Survey, South Africa

Overall, there was good negative and positive percent agreement between HIV results based on medical record review (routine programme data) and the ANC survey (EIA results from the laboratory) – Figure 13 & Table 5. The overall negative percent agreement was 94.4% and was highest in the Eastern Cape at 97.6% and lowest in the North West province at 89.5%. On the other hand, the overall positive percent agreement was high at 97.3% and

varied across provinces from 98.5% in Free State to 94.0% in Limpopo. While both negative and positive agreement was high overall, it did not meet the 98.0% WHO target for replacing EIA testing with routine programme data in all provinces. Negative percent agreement decreased by 5.1% points from that observed in 2019 while positive percent agreement remained the same.

Table 5. HIV agreement between routine programme data (medical records) and antenatal survey (EIA testing) of HIV test results by province, 2022 Antenatal HIV Sentinel Survey, South Africa.

EIA	Medical Records			Agreement % (95% CI)
	Positive	Negative	Total	
Overall				
Positive	10 276	285	10 561	97.3 (97.0 – 97.5)
Negative	1 262	22 370	23 632	94.4 (93.9 – 94.8)
Eastern Cape				
Positive	1 664	30	1 694	98.2 (97.7 – 98.7)
Negative	73	2 991	3 064	97.6 (96.9 – 98.2)
Free State				
Positive	840	13	853	98.5 (97.7 – 99.0)
Negative	51	1 735	1 786	97.1 (96.2 – 97.9)
Gauteng				
Positive	1 429	31	1 460	97.9 (97.3 – 98.3)
Negative	255	3 310	3 565	92.9 (91.7 – 93.9)
KwaZulu Natal				
Positive	3 309	69	3 378	98.0 (97.5 – 98.3)
Negative	381	4 709	5 090	92.5 (91.5 – 93.5)
Limpopo				
Positive	583	37	620	94.0 (92.4 – 95.3)
Negative	66	2 222	2 288	97.1 (96.4 – 97.7)
Mpumalanga				
Positive	980	26	1 006	97.4 (96.5 – 98.1)
Negative	101	1 921	2 022	95.0 (93.0 – 96.5)
North West				
Positive	642	26	668	96.1 (92.2 – 96.4)
Negative	178	1 517	1 695	89.5 (87.3 – 91.3)
Northern Cape				
Positive	233	13	246	94.7 (92.2 – 96.4)
Negative	48	1 180	1 228	96.1 (94.3 – 97.4)
Western Cape				
Positive	596	40	636	93.7 (92.1 – 95.0)
Negative	109	2 785	2 894	96.2 (95.7 – 96.7)

3.7. Viral load monitoring

The national maternal viral load testing coverage was 88.1% (6 555 out of 7 402). Coverage of viral load testing was greater than 80% across all provinces (Figure 14). Of those who had a viral load test done and were due for a viral load test, 80.0% (5 291) had received their viral load results. Among those who had a viral load test and received results, 74.1% (3 940) were virally suppressed (<50 copies/ml).

Viral load testing coverage was highest in Northern Cape (93.1%, 95% CI: 89.4 – 95.5) and lowest in Western Cape (80.5%, 95% CI: 77.3 – 83.4). The proportion of those with documented or who have received viral load tests was greater than 76% across all provinces with the highest proportion in KwaZulu-Natal (85.2%, 95% CI: 83.0 – 87.2). The lowest viral suppression was 53.7% (Northern Cape Province) and the highest was 81.3% (KwaZulu-Natal Province).

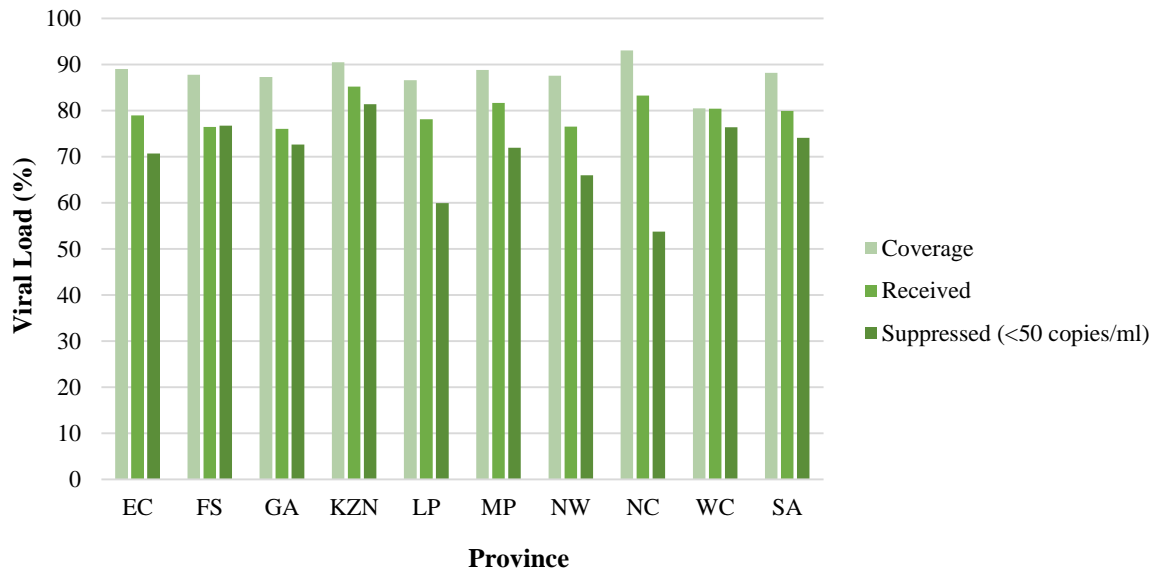
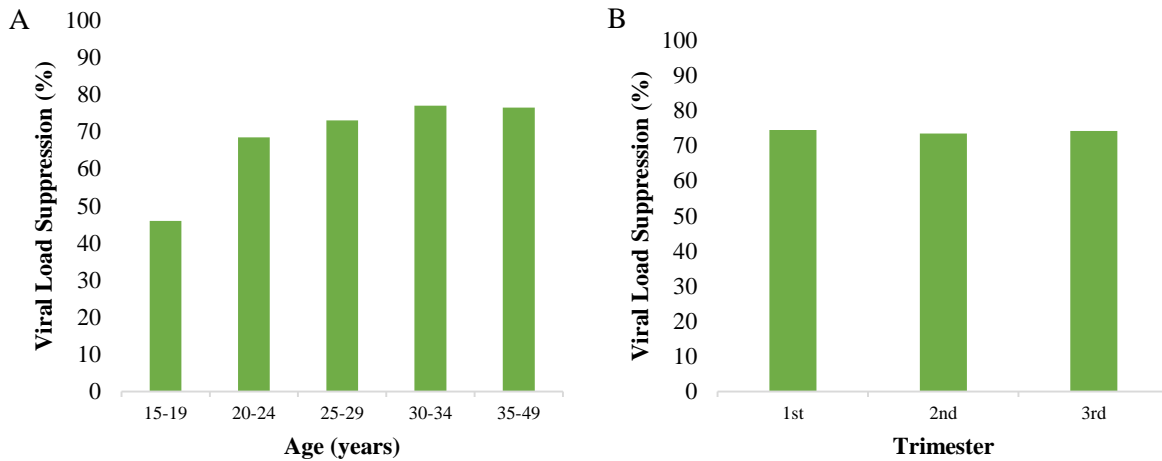


Figure 14: Viral load testing among antenatal women, in the 2022 HIV Antenatal Survey, South Africa

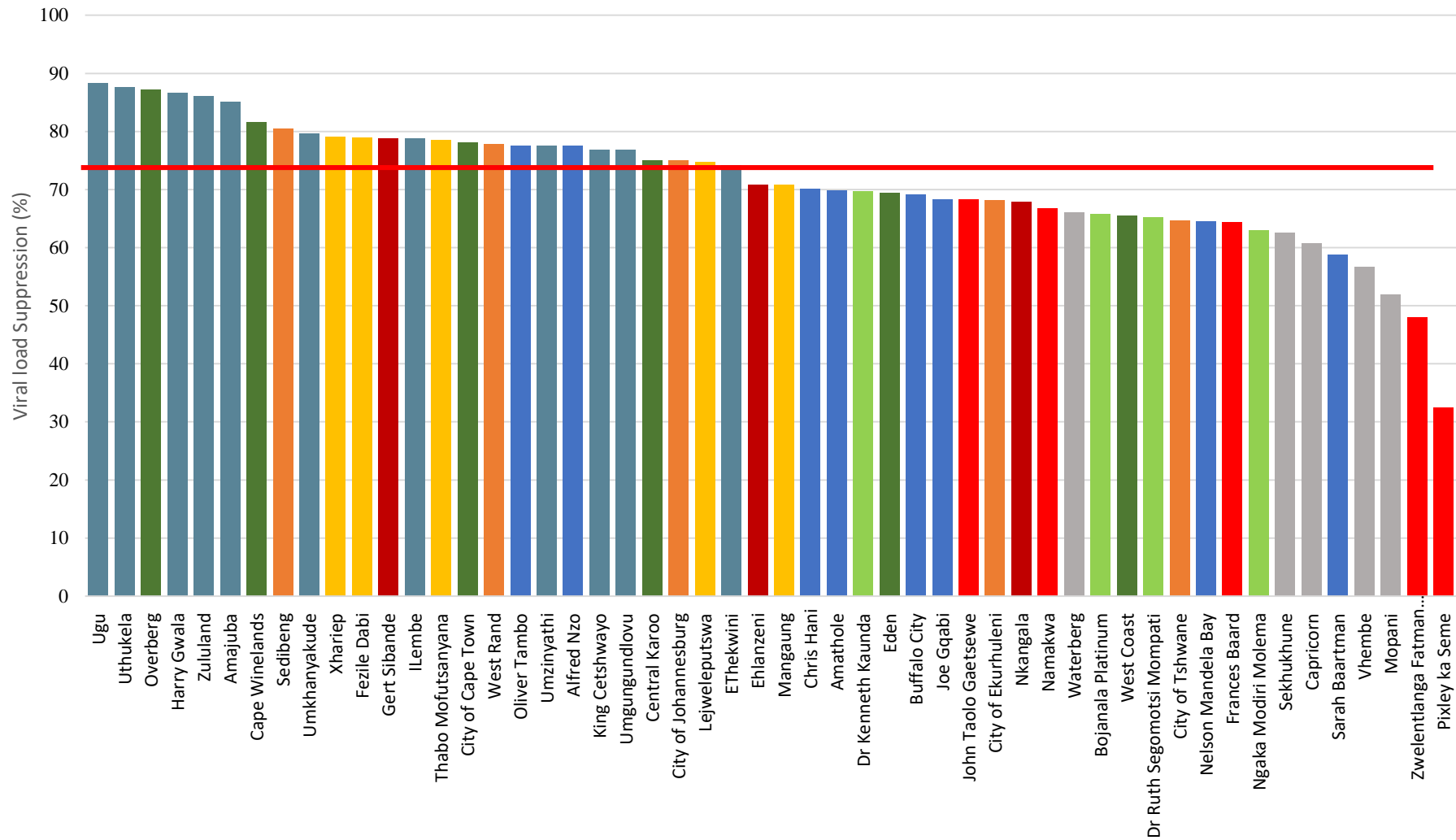
Viral load suppression (<50 copies/ml) was low among 15 – 19-year-olds (46.0%) and women aged 30 – 34 years had a high viral load suppression of 77.1% (Figure 15). Viral load suppression did not vary by pregnancy trimester (first: 74.5%, second: 73.5% and third: 74.2%).



The denominator for viral suppression (<50 copies/ml) was the number of HIV positive women with viral load results among those who were due for a viral load test, had viral load test done and received results. Missing data excluded.

Figure 15: Viral load suppression by age groups (A) and by trimester (B), in the 2022 Antenatal HIV Sentinel Survey, South Africa

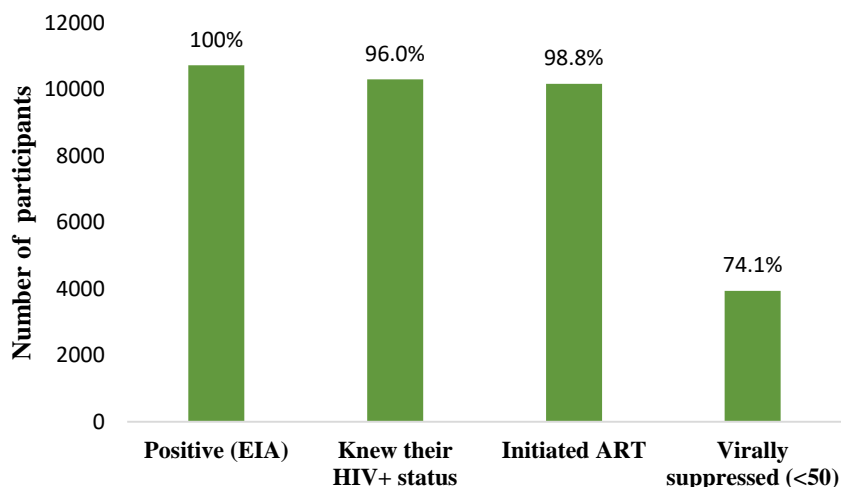
The highest (Figure 16) viral load suppression (<50 copies/ml) was reported in Ugu District (88.2%, 95% CI: 83.3 – 91.8). Of the 52 districts, 25 districts had viral suppression that was higher than the national average (74.1%, 95% CI: 73.0 – 75.1). From the 25 districts, eleven were from KwaZulu-Natal, four were from Free State and four were from Western Cape provinces. The other six were from Eastern Cape (2), Gauteng (3) and Mpumalanga (1).



The red line indicates viral load suppression (74.1%) at the national level

Figure 16: Viral load suppression (<50 copies/ml) among pregnant women by district (2022), Antenatal HIV Sentinel Survey, South Africa

Overall, among HIV-positive women, 96.0% knew their HIV status at the time of the survey and 98.8% were initiated on ART among those who knew their HIV-positive status (Figure 17). Viral suppression was 74.1% among those on ART. This care cascade was equivalent to a population cascade³ of 96–95–73. Viral suppression levels among those who were due for viral load testing and had received results was similar to that observed in 2019 despite the roll-out of dolutegravir (DTG)-based regimens which are expected to be more effective in lowering viral loads among HIV positive pregnant women.



The denominator for each step is the size of the population in the previous step

Figure 17: HIV care cascade among antenatal women, in the 2022 HIV Antenatal Survey, South Africa

The coverage of DTG among pregnant women taking ART at the national level was 67.9% (Figure 18). Northern Cape Province had the lowest coverage of DTG (35.6%), and KwaZulu-Natal Province had the highest coverage of DTG (80.8%). In terms of age, 15–19-year-old women had a coverage of 73.6% and the lowest was among women aged 35–49 years (64.2%).

³The care cascade uses the previous step's population as denominator while the population cascade uses the total number of PWLHIV as the denominator.

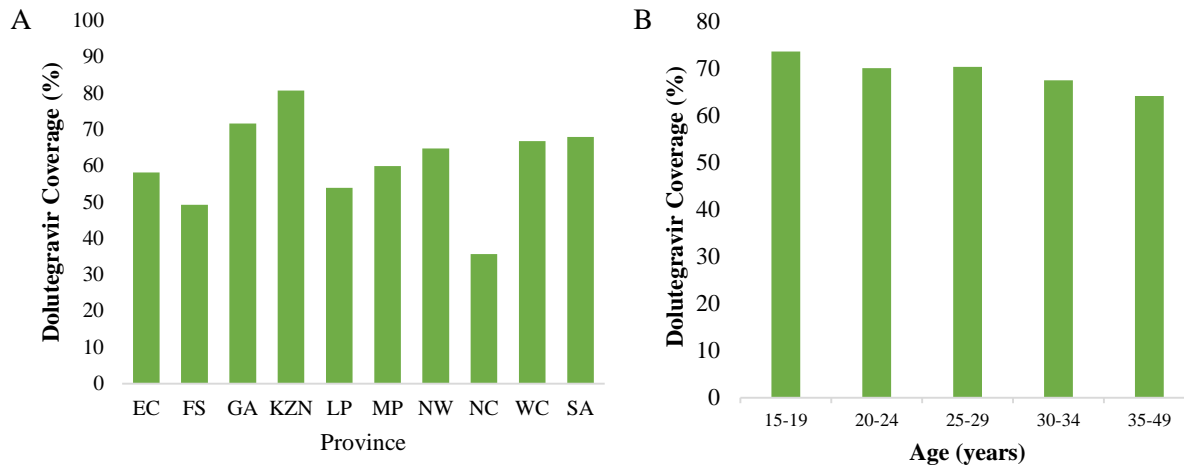


Figure 18: Dolutegravir treatment coverage by (A) province and by age groups (B) among antenatal women, in the 2022 HIV Antenatal Survey, South Africa

Overall, DTG-based regimen coverage was high (67.9%) followed by the Efavirenz (EFV)-based regimen, which had a coverage of 29.5% (Figure 19). Only 2.5% of women taking ART were on a second line regimen. The KwaZulu-Natal province (80.8%) had the highest proportion of ANC women on DTG while Northern Cape (35.6%) had the lowest.

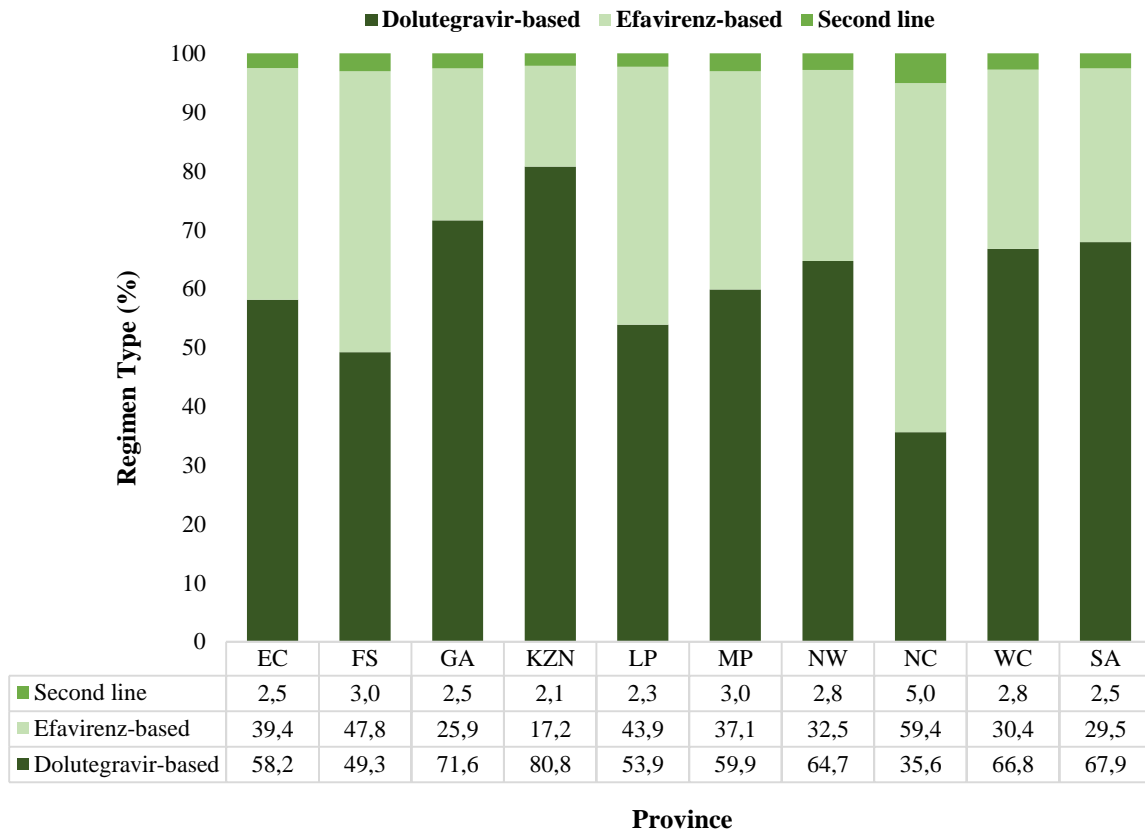


Figure 19: ART treatment coverage by regimen type among antenatal women, in the 2022 HIV Antenatal Survey, South Africa

The proportion of participants with a viral load ≥ 1000 copies/ml was 9.5%, nationally (Figure 20). Northern Cape had the highest proportion (26.1%) and the lowest proportion was in KwaZulu Natal (5.6%). Nationally, 16.4% had viral load results between 50 – 999 copies/ml with the highest proportion in Limpopo (26.9%) and lowest in Western Cape (11.1%).

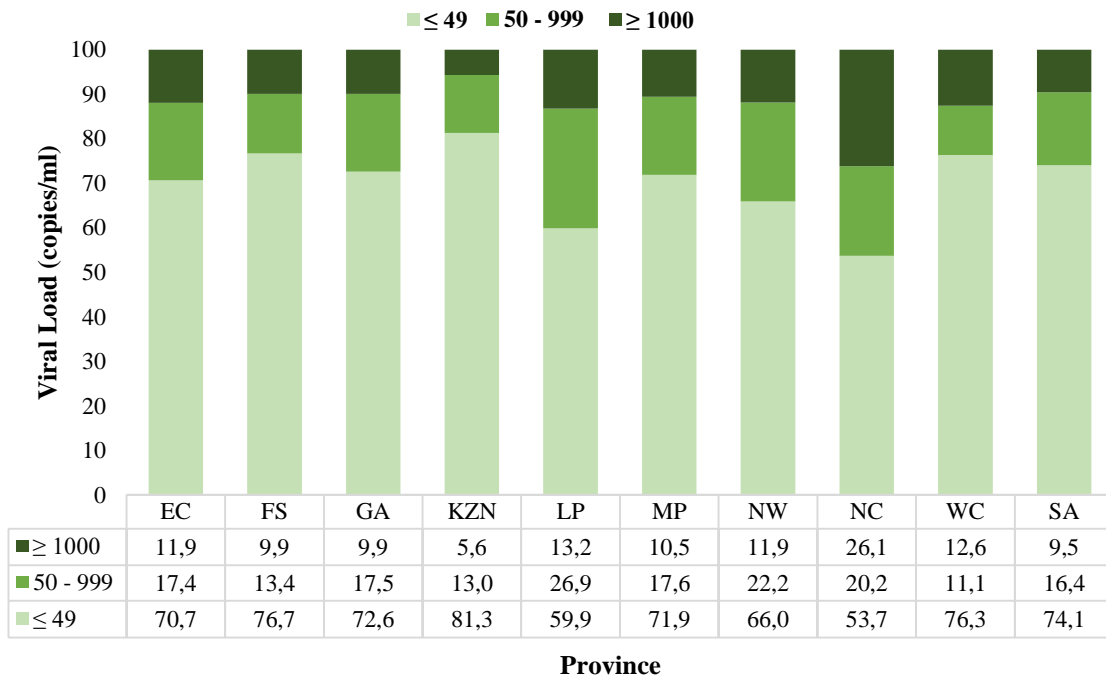


Figure 20: Viral load results (copies/ml) by province in the 2022 Antenatal HIV Sentinel Survey, South Africa

Compared to women who are 35–49 years, the proportion with viral load ≥ 1000 copies/ml was significantly high in all age groups, except for women who are 30–34 years (Figure 21). Viral load ≥ 1000 copies/ml were low by pregnancy trimester with the lowest being 8.8% during the third trimester.

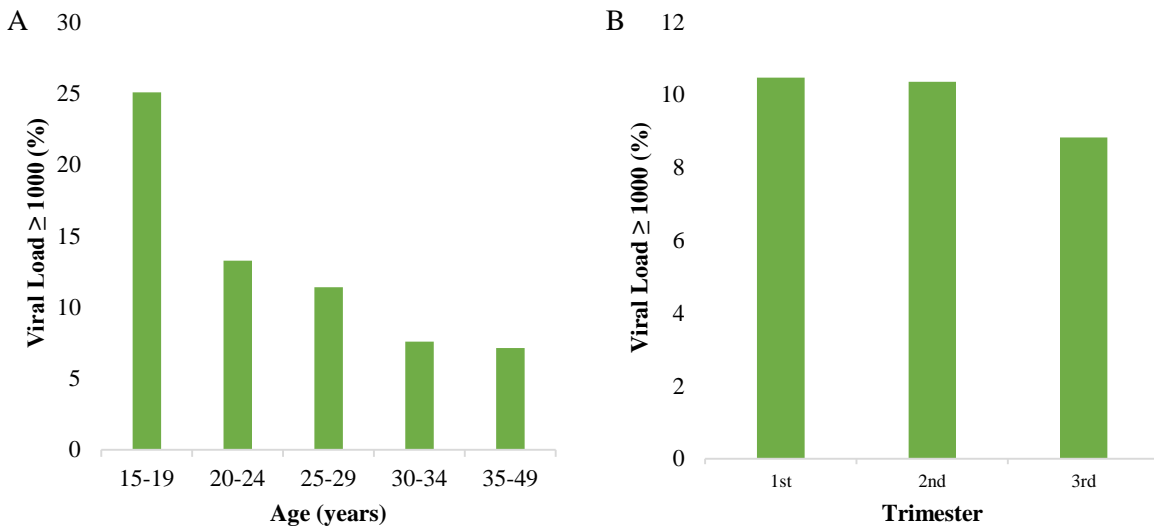


Figure 21: Viral load test results ≥ 1000 copies/ml by age groups (A) and by trimester (B), in the 2022 Antenatal HIV Sentinel Survey, South Africa

3.8. PrEP coverage

Nationally, 31.2% (7 271 out of 22 655) of HIV negative women were eligible for PrEP. Among those who were eligible for PrEP and whose prior use of PrEP was reported, 3.6% (95% CI: 3.2 – 4.0) were on PrEP before pregnancy (Figure 22). Current use of PrEP was 6.5% (95% CI: 5.7 – 7.4) of those who were eligible and whose current PrEP use was reported.

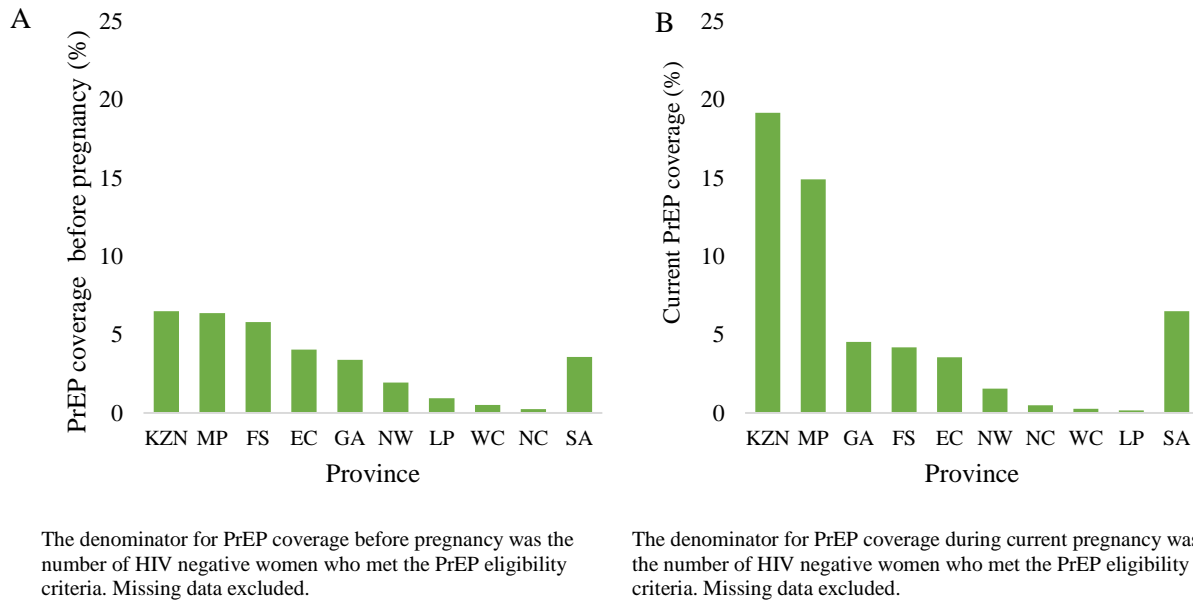
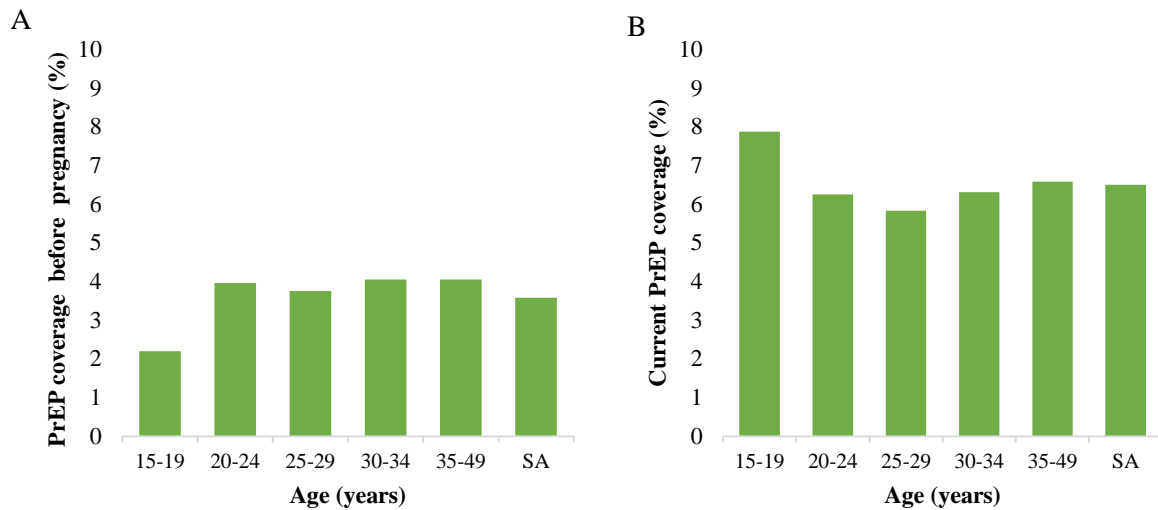


Figure 22: PrEP coverage before pregnancy (A) and during current pregnancy (B), in the 2022 Antenatal HIV Sentinel Survey, South Africa

KwaZulu-Natal Province had higher PrEP coverage before (6.5%, 95% CI: 5.4 – 7.8) and during current (19.2%, 95% CI: 16.0 – 22.9) pregnancy compared to other provinces. The lowest coverage of PrEP before pregnancy was in Northern Cape Province (0.25%, 95% CI: 0.1 – 1.2) and the lowest PrEP coverage during current pregnancy was in Limpopo (0.16%, 95% CI: 0.0 – 0.7).

PrEP coverage before pregnancy was significantly lower among younger women (15–19 years) compared to older women (35–49 years), p-value <0.01. The highest PrEP coverage during current pregnancy was 7.9% (95% CI: 6.5 – 9.5) in women who were 15–19 years and lowest was 5.8% (95% CI: 4.8 – 7.0) in women who were 25–29 years, however, current use of PrEP did not vary by age (Figure 23).



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 current pregnancy was the number of HIV-negative women who met the PrEP eligibility criteria. Missing data excluded.

Figure 23: PrEP coverage before pregnancy (A) and during current pregnancy (B) in the 2022 Antenatal HIV Sentinel Survey, South Africa

3.9. Early ANC attendance

Only just above a third (25.8%) of participants attended their first ANC-visit before or at 12 weeks of pregnancy as per the WHO recommendations (Figure 24). The majority of participants (66.5%) attended their first ANC-visit in their second trimester, while a small percentage (7.7%, 2 538) of participants attended their first ANC-visit during the third trimester of their pregnancy.

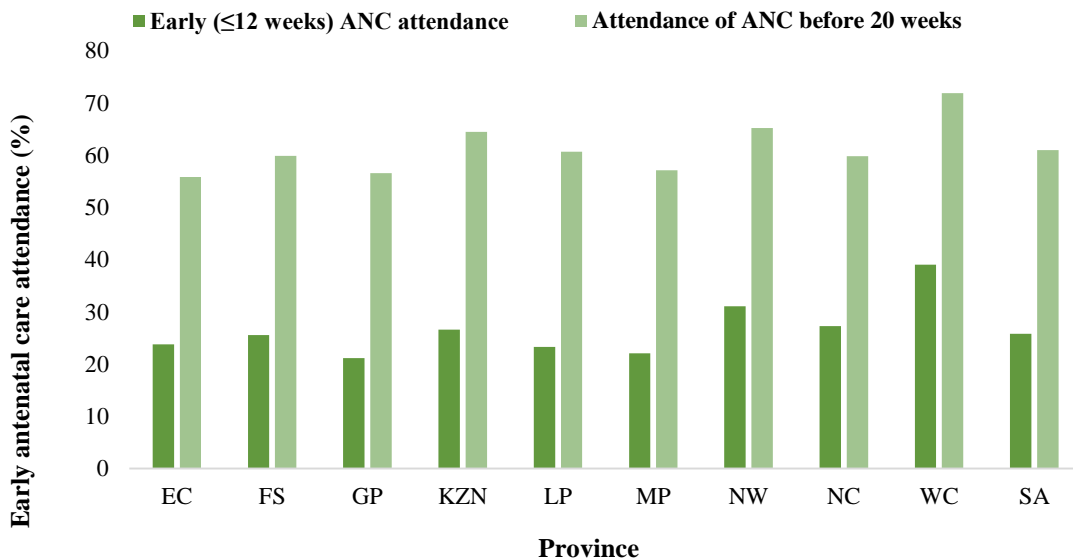


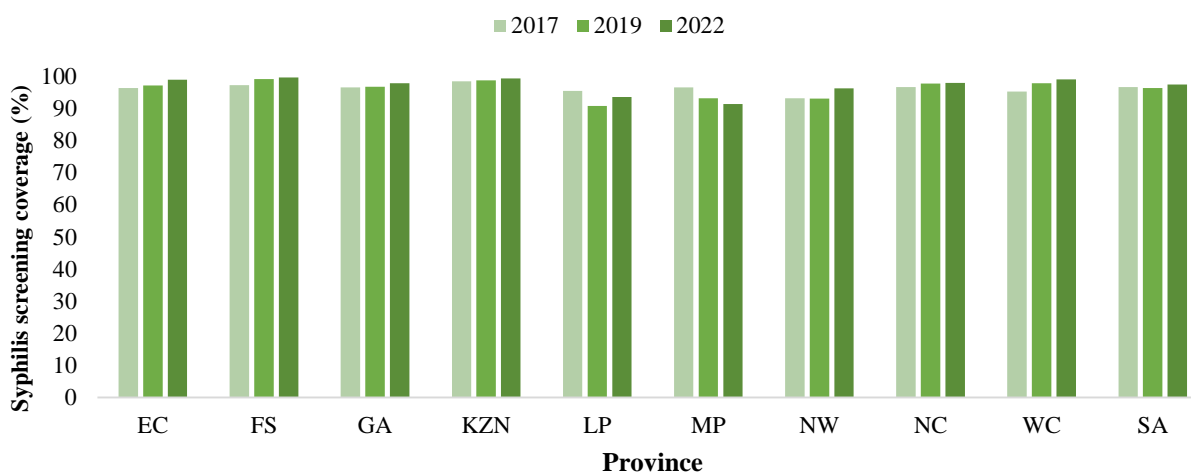
Figure 24: Early attendance of antenatal care by province in the 2022 Antenatal HIV Sentinel Survey, South Africa

Less than two-thirds (61.0%) of participants attended their first ANC-visit before 20 weeks of pregnancy. The highest attendance of ANC before 20 weeks of pregnancy was in Western Cape

Province at 71.9% and the lowest was in Eastern Cape Province at 55.8%. Attendance of ANC before 20 weeks was lower than the national average (61.0%) among women with high (≥ 4) gravidity (55.4%), single women (50.4%), participants with no education (51.7%) or primary education (57.4%), adolescent girls (54.7%) and women older than 40 years (57.0 %).

3.10. Maternal syphilis screening and treatment coverage

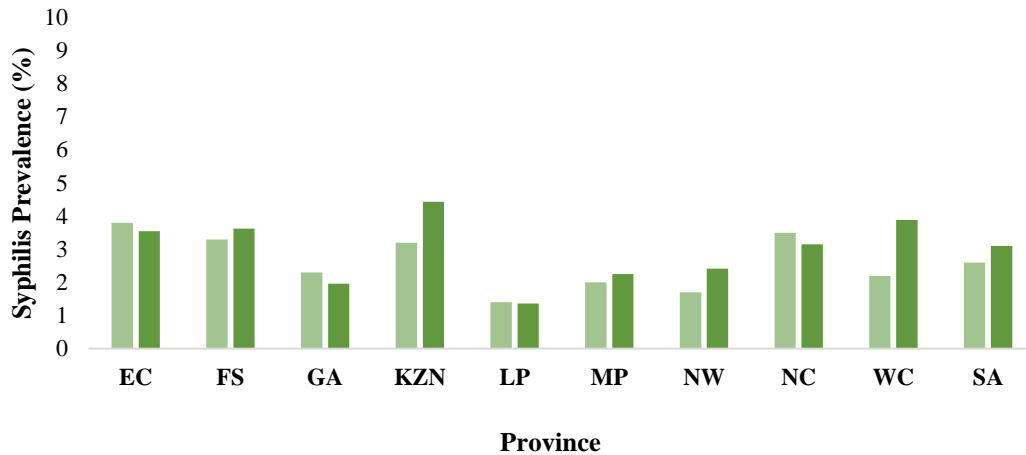
Maternal syphilis screening coverage was 97.5% at national level, representing a 1.1%-point increase in syphilis screening coverage from 2019 (96.4%) (Figure 25). All provinces had greater than 90% syphilis screening coverage. Syphilis screening coverage data were missing for 2.5% of participants. If we assume that all missing responses indicate the participant did not receive the screening test, and include them as such in the denominator, the national coverage for syphilis screening decreases from 97.5% to 95.0%.



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

Figure 25: Maternal syphilis screening coverage among antenatal women, in the 2017, 2019, 2022 Antenatal HIV Survey, South Africa

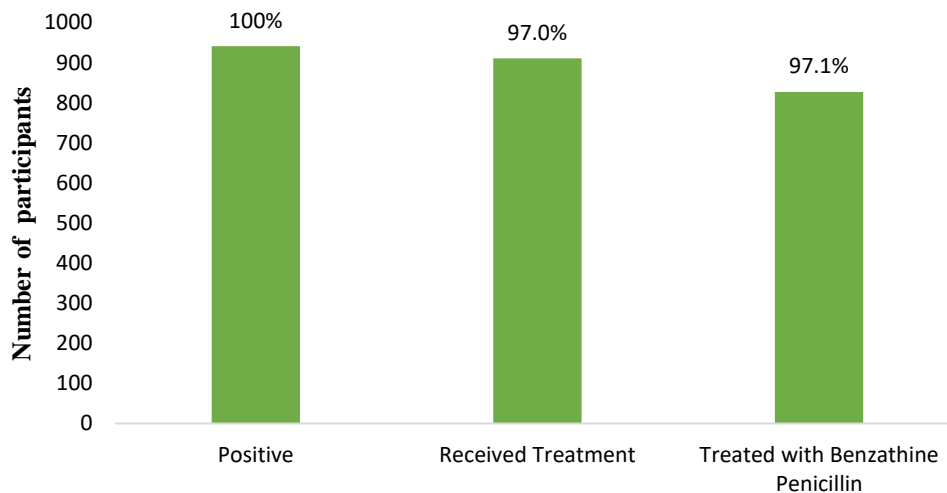
Of the women who were screened for syphilis, 2.6% (992) were positive, 78.2% (27677) were negative, 18.4% (5 516) had pending results, 0.9% (n = 262) did not have results in file. In total, 19.2% were missing results among those who had a test (either because they were pending in the laboratory or not in file) similar to 20.5% in 2019. Western Cape Province had the lowest percent of results (2.6%), and Gauteng Province had the highest percent of missing results (31.7%). After excluding the pending results and the results not in file, the prevalence of syphilis (per medical record review data) among those who had a syphilis test result, was 3.1 % (95% CI: 2.9 – 3.3) at national level (Figure 26). 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 26: 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. Of those treated for syphilis and had type of treatment data reported (847), 97.1% (827) were treated with at least one dose of BPG – these translates to 85% coverage of syphilis treatment with at least one dose of BPG among all syphilis-positive participants (Figure 27). If we assume that all missing responses mean that the subjects did not receive treatment for syphilis and include as such the missing data in the denominator, the coverage of syphilis treatment and treatment with BPG decreases from 97.0% to 92.2% and from 97.1% to 89.1%, respectively.



*5.0% (51) of syphilis-positive participants and 8.2% (64) participants treated for syphilis had not responded for 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 27: Syphilis treatment cascade among antenatal women, in the 2022 HIV Antenatal Survey, South Africa

Syphilis treatment coverage was >95% in six provinces; with the lowest coverage being 82.4% in Northern Cape Province and the highest coverage being in Free State (100%) and Limpopo (100%) (missing data were excluded from the denominator) (Figure 28).

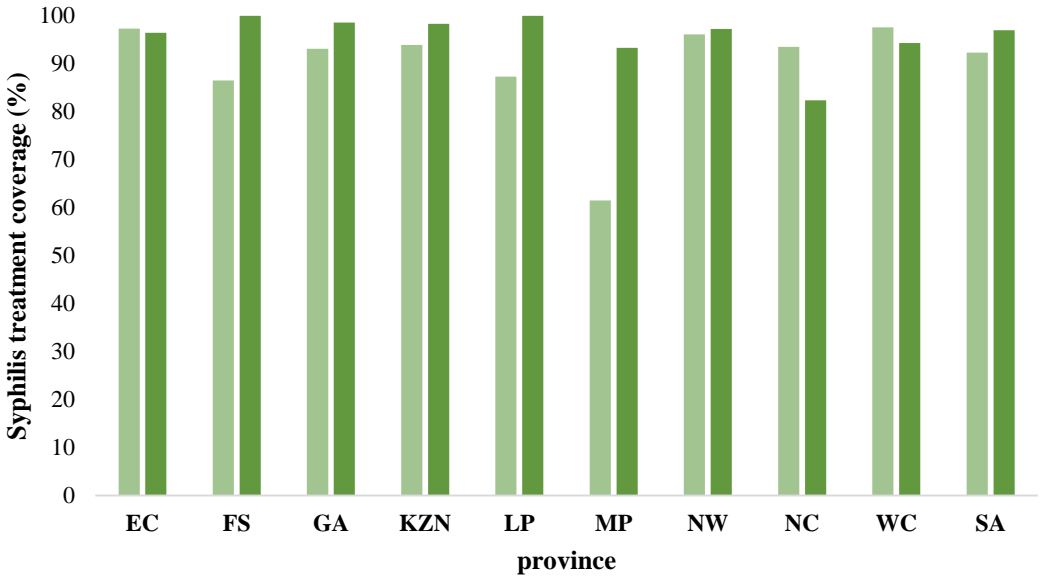


Figure 28: Syphilis treatment coverage among antenatal women in the 2022 HIV Antenatal Survey, South Africa

Chapter 4: Conclusions and Recommendations

4.1. Summary of results

In this national survey conducted post-COVID lockdown restrictions during February – April 2022 (as opposed to October – November 2021) and including 37 828 participants:

- The demographic profile of patients was similar to that observed in prior surveys.
- Overall HIV prevalence was 27.5% representing a 2.5%-point decline from the prevalence observed in 2019.
- The HIV prevalence trends were similar to prior surveys
 - HIV prevalence was highest in KwaZulu-Natal, Eastern Cape and Mpumalanga provinces.
 - HIV prevalence continued to decline among younger women aged 15–24 years.
 - 27 districts had HIV prevalence above the national average.
- There were significant declines in HIV prevalence in all provinces with declines >2% in Northern Cape, Eastern Cape, KwaZulu-Natal, Mpumalanga and Free State provinces.
- There was near universal knowledge of HIV status (96.0%) among pregnant women enrolled but there was a decrease in the proportion of participants who initiated ART prior to pregnancy from 93.3% in 2019 to 84.2% in 2022.
- There was high positive and negative percent agreement overall, but this did not meet the 98% benchmark for use of routine data for estimating HIV prevalence among women attending ANC.
- Viral load testing coverage increased to 88% compared to 80% in the 2019, although viral suppression rate (<50 copies/ml) remained the same between the two surveys.
- As a measure of progress in the roll-out of DTG-based regimens among pregnant women, 65% of women who were on ART were receiving a DTG-based regimen.
- Only 31% of HIV-negative women met criteria for PrEP eligibility using the NDoH criteria for eligibility; however, only 3.7% of those eligible reported PrEP use prior to pregnancy while 6.2% reported current PrEP use.
- Low ANC attendance prior to 12 weeks was 26% while attendance prior to 20 weeks was 61% in the 2022 survey.
- There was high coverage of syphilis screening at levels similar to previous surveys. However, the proportion of women who did not have results on file (≈20%) remained the same as in 2019, highlighting the need for rapid syphilis testing to ensure women get results on the same day and initiate treatment early.
- There was an increase in the proportion of women who were syphilis-positive based on record review. The 3.1% prevalence represented a 0.5%-point increase from 2019 and 19% increase in the prevalence. The proportion receiving treatment was high at 97% up from 92% in the previous survey.

4.2. Discussion of results

Because of delays in planning and procurement of materials for the survey, the 2021 edition of the survey could not be conducted in the period October – November as was the case with previous surveys. Instead, data collection for the survey was conducted during February – April 2022. The concern was that this change in enrolment period could change the profile of pregnant women seen in the clinics and therefore enrolled in the survey. Similarities in demographics and characteristics between women enrolled in this current survey and those in prior surveys were reassuring and showed that the change in timing is unlikely to have affected the validity of the survey. The overall HIV prevalence estimate of 27.5% represents a 2.5%-point decline and 8.3% reduction from the 2019 estimate (5). This reduction in HIV prevalence was evident in all provinces with five of the nine provinces reporting reductions greater than 2% points. Given the similarity in participant profiles between the current survey and the previous survey, it is likely that this apparent reduction in prevalence is not an artefact of the data. Data on HIV prevalence trends among first ANC visit attendees by age confirmed a trend of sustained declines in HIV prevalence among younger women in the age groups 15–19, 20–24, 25–29 and 30–34 years since 2014. This decline is likely due to older women with higher HIV prevalence ageing out of the reproductive age and being replaced by younger women with lower HIV prevalence. Although AGYW aged 15–24 years represent the group with the highest HIV incidence in the country, this incidence has been declining since 2010. The declining prevalence of HIV in younger women also coincided with the lower proportion of AGYW being enrolled in the survey. Starting in 2014, the proportion of survey participants aged 15–19 years declined from 17% to 13% while participants aged 20–24 years declined from 30% to 26%. The reasons for fewer younger women being enrolled in the survey are unclear. It may be a decline in pregnancies among AGYW, sub-optimal ANC care attendance in this group or their unwillingness to be enrolled in the survey.

While the country can and should celebrate a declining HIV prevalence, the HIV prevalence among pregnant women in South Africa remains very high at 27.5%. As HIV treatment is near universal among pregnant women and 78.1% of HIV positive pregnant women are already on ART prior to pregnancy, a further reduction in incidence will only be possible with large reductions in HIV incidence through primary HIV prevention interventions such as male circumcision, correct and consistent condom use and PrEP use before and during pregnancy. While HIV incidence has been declining in South Africa since 2010, the magnitude of the reduction has been insufficient to meet global targets for ending AIDS as a public health threat (1).

The 2022 survey confirmed the near universal coverage of HIV testing among pregnant women in South Africa and initiation of ART among those who are HIV positive. This high coverage of HIV testing and treatment evident across all provinces hides disparities at district levels and by age (12). While 78% of PWLHIV knew their status prior to pregnancy, this was not the case among AGYW where only 54% of PWLHIV aged 15–19 years knew their status prior to pregnancy compared to 86% who knew their status prior to pregnancy among those 35–49 years. The proportion of PWLHIV who had initiated ART declined by nine percentage points in the 2022 survey compared to the 2019 survey (5). This decline was evident in all provinces and across all age groups. This could have been due to COVID-19 which caused disruptions in HIV testing and ART initiation resulting in fewer women having accessed HIV care prior to pregnancy (13–14). Studies from South Africa reported reductions in HIV testing and ART initiation of up to 46% during the period of COVID-19 associated restrictions. Getting the HIV testing and linkage to care

programme back on track will ensure that WLHIV access testing and ART initiation prior to pregnancy.

WHO and UNAIDS recommend using routine antenatal care data for HIV surveillance among pregnant women. The transition from sentinel surveillance (SS) to routine data requires that the following elements be in place: (i) agreement between ANC SS and routine antenatal HIV test results; (ii) minimal selection bias inherent in PMTCT-based HIV estimates; (iii) high coverage of PMTCT routine HIV testing services at ANC SS sites; (iv) optimal data quality for the minimum set of surveillance variables in routinely collected programme records; and (v) optimal quality assurance practices around HIV testing at ANC sites. Previous ANC surveys (2017 and 2019) demonstrated good positive/negative agreement and minimal bias in the context of high ANC attendance (15). However, the quality of a minimum set of surveillance variables in routinely collected programme records was poor and quality assurance practices around HIV testing at ANC sites were found to be sub-optimal in the 2017 survey (4, 16).

Viral load testing coverage (that is having at least one viral load test done during the current pregnancy) increased to 88% in the 2022 survey compared to the 82% in 2019. There was a decrease in the proportion of women with viral load results in their files or records from 94% in 2019 to 80% in 2022. The increased viral load coverage may have been due to the implementation of the 2019 PMTCT guidelines which were introduced in November of 2019 (7) just as data collection for the 2019 survey was concluding. These guidelines recommend viral load measurement for pregnant women on ART at first ANC booking and frequency of viral load monitoring to 6–8 weeks for women with low-level viremia (50–1 000 copies/ml) and 4–6 weeks for women with high-level viremia (>1 000 copies/ml) (7). The 2019 guidelines also introduced electronic gatekeeping (EGK) codes for use by the NHLS to identify viral load testing specimens from pregnant women and minimise specimen rejection on the grounds of too frequent testing (7). Despite increased monitoring, viral suppression rate (<50 copies/ml) remained the same between the two surveys. In research and surveillance studies, plasma viral loads <50 copies/ml are associated with negligible to no vertical transmission. It is concerning that only 74.1% of pregnant WLHIV in the survey on ART and due for viral load monitoring were virally suppressed, with around 10% having viral loads >1 000 copies/ml. This is against a target or benchmark of 95%. None of the provinces or districts attained this 95% benchmark. Also, viral suppression levels did not differ much by trimester, suggesting that a significant proportion of women remain viraemic at delivery, increasing the risk for vertical transmission of HIV. Interventions to improve retention and adherence to medications are needed. Studies have reported peer mentors, and lay or nurse counsellors as some interventions that have successfully improved retention in care and viral load suppression during pregnancy (17). Injectable antiretrovirals, when approved for use in pregnancy may be another solution where adherence to oral drugs is sub-optimal and cannot be improved with available interventions.

The lack of change in viral suppression rates was observed despite the roll-out of DTG-containing regimens in the country. The proportion of pregnant WLHIV on ART taking DTG-containing regimen was 68% overall and varied by province, ranging from 36% in Northern Cape to 81% in KwaZulu-Natal. DTG, an integrase strand inhibitor, has been associated with a quicker time to viral suppression, especially among pregnant women who start ART in late pregnancy (7, 18). DTG also has a higher genetic barrier to resistance – that is, the HIV virus has to acquire a higher number of mutations in order to develop resistance to DTG compared to Efavirenz-containing regimens, for example (7, 17). The drug is now recommended for all people, including pregnant

women or those who intend to fall pregnant (7, 17). There is a need to scale up the roll-out of DTG-based regimens while educating healthcare workers and women about the drug, its perceived and real adverse effects, and the advantages of taking DTG for mothers and babies.

For the first time ever, the 2022 ANC survey measured eligibility for coverage of PrEP before and during the current pregnancy. Eligibility for PrEP was 31% using the NDoH PrEP criteria (9). Coverage of PrEP was also across all provinces and age groups. There is a need to integrate PrEP eligibility assessment and provision into antenatal care to identify women at risk of acquiring HIV during pregnancy. Incident HIV infection during pregnancy is associated with very high maternal viral loads and a higher likelihood of in-utero transmission of HIV and is now thought to account for as much as a third of vertical HIV transmission in South Africa (19, 20). In addition to PrEP use, other prevention methods need to be strengthened – male circumcision, condom use as well as HIV testing and ART initiation for male partners.

Early attendance is critical to allow enough time to screen for major conditions affecting the mother and baby and to intervene. The WHO recommends attendance to first ANC visit prior to 12 weeks and eight ANC visits prior to delivery. ANC attendance prior to 12 weeks was 26% while attendance prior to 20 weeks was 61% in the 2022 survey. This was down from 35% and 70.1% respectively in the 2019 survey. The DHIS reported that 69% of ANC attendees at public health clinics in 2021 attended the first visit at <20 weeks' gestation (10). Early ANC attendance is one of those indicators that was affected by COVID-19. Pillay et al. (14) reported that ANC attendance before 20 weeks, as recorded in the DHIS, decreased by more than 40% from March 2020 to November 2020 (14). There is need to re-educate women about the benefits of early ANC attendance and to make antenatal services friendly for women who attend ANC early.

The high coverage of syphilis screening which was at levels similar to previous surveys was encouraging. However, the proportion of women who did not have results on file, ≈20% remained the same as in 2019, emphasising the need for rapid syphilis testing to ensure women get results on the same day and initiate treatment early. Efforts are underway to introduce and roll-out dual and single rapid syphilis tests in ANC services nationally, along with a quality assurance programme to ensure good quality testing and results. These tests will allow the immediate identification of women who may have active syphilis for confirmatory testing and immediate treatment.

The proportion of women who had tested positive for syphilis increased by 0.5 percentage points (2.6% to 3.1%) and by 19% between the 2019 and 2022 surveys. The syphilis seroprevalence estimate increased by one percentage point since 2015. The increase in maternal seroprevalence mirrors the sustained increase in congenital syphilis notifications (21) the number of RPR-positive infants since 2017 (22) as well as the increase in the relative contribution of syphilis as a cause of genital ulcer disease in recent years, especially in the KwaZulu-Natal Province (23). There is a need to strengthen primary STI prevention and STI prevention among pregnant women and their partners through symptom screening, rapid testing and treatment, partner notification and referral for voluntary male circumcision if not already circumcised. Other interventions such as doxycycline post-exposure prophylaxis (PEP to be taken within 24 hours of unprotected intercourse, could be investigated as an intervention to reduce STIs, including syphilis in the general population with spill-over effects among pregnant women. Studies from the United States showed that Doxycycline PEP was associated with a 66% reduction in new STIs among PrEP users and 62% reduction among PLHIV (23-26).

There was an improvement in the coverage of treatment for syphilis and coverage of treatment with BPG compared to the previous survey. This could have been due to improvements in the BPG supply chain, which has been plagued by shortages since 2016 (27). The National Department of Health has prioritised pregnant women for treatment with BPG where there are shortages (28). While this may have contributed to improved treatment coverage among pregnant women, it may result in higher risk of re-infection as male partners are treated with doxycycline or erythromycin which have been associated with incomplete treatment and risk of transmission.

4.3. Strengths and limitations

The 2022 edition of the ANC survey was a large survey that enrolled a sample of pregnant women that was representative of pregnant women accessing care at public health facilities in the country. The survey was done in the same way as previous surveys since 2017, allowing analyses for trends in key indicators such as knowledge of HIV testing, ART initiation, and viral suppression but also included data on newer indicators – coverage of DTG-based regimens among pregnant WLHIV on ART as well as PrEP eligibility and coverage. Data on this survey was, however, subject to a several limitations. The main ones were:

- 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 generalizability 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 the North West Province (85.5%). Clinics collected extra samples to compensate for samples that may have haemolysed during transportation and to assist clinics that were remaining behind in sample size realisation. To adjust for variability in sample size achievement between districts, in the 2022 survey, all analyses were weighted for sample size realisation.
- 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. In 2022, specimen rejection accounted for 45% of exclusions, while in 2019, specimen rejection accounted for 90% of exclusions. There was however, no substantial difference observed in the demographic characteristics of participants excluded from the analysis due to rejections.
- Compared to previous surveys, missing data and inconsistent reporting were 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 resolution of some inconsistencies while some that could not be resolved were set to missing, potentially biasing the results. The antenatal survey is collected by NDoH staff/nurses providing ANC services. Limited supervision and monitoring support was given at site level for nurses collecting the data as the district teams responsible for coordinating and supervising survey implementation had other conflicting commitments/responsibilities, which resulted in inadequate support for the survey. The inadequate support and supervision could have led to data not being recorded properly and data being lost, leading to information bias on an outcome by outcome basis. However, G:ENESIS Analytics provided WhatsApp support and telephonic support during the survey. In addition, the availability of a training video on YouTube allowed better roll-out of training by the trainers.

- Data on HIV testing and results based on record review represent HIV testing in the past – days, weeks to years earlier than the date of enrolment. The calculation for agreement compared these HIV results to results from centralised laboratory testing. PPA for record review may appear poorer because of individuals who may have seroconverted since the last test.
- Data on viral load testing and the viral load results from record review did not consider the recommended frequency of viral load monitoring during pregnancy. So, while coverage for at least one viral load was high, this proportion may hide deficits in continued viral load monitoring, the lack of which increases the risk of vertical transmission.
- Data on syphilis prevalence were based on a record review. A syphilis-positive result was reported by facilities based on laboratory-based specific and non-specific results, rapid syphilis tests, and evidence of treatment. The lack of standardised syphilis testing can affect the syphilis prevalence estimate. However, most individuals (84%) reported as syphilis positive had a positive RPR result.
- Screening or testing findings for syphilis were abstracted regardless of the timing of the screening. The NDoH recommends screening at booking and again at 32–34 weeks' gestation. The screening at any point indicator hides a large gap in rescreening which is especially important in high-incidence settings like South Africa.
- Syphilis treatment findings were abstracted regardless of the timing of the treatment. The NDoH recommends treatment at least 30 days before delivery. The treatment at any point after screening indicator hides gaps in late screening, contributing to congenital syphilis.

4.4 Conclusions and suggestions

Based on the conduct and findings of this survey the following recommendations for policy, practice and research.

Suggestions for policy and practice

- Continue to strengthen and promote early ANC attendance. This can be done through primary healthcare clinics, pharmacies, and private practitioners that look after women at risk of or are planning to get pregnant. A nationwide media campaign may also assist in reaching women of reproductive age with messages promoting early ANC attendance.
- Strengthen HIV testing and ART initiation among women of reproductive age living with HIV. This is so that they are already on ART at conception and can receive retention and adherence support in order to maximise viral suppression during pregnancy, delivery and the post-partum periods. Special focus should remain on AGYW who still have lower knowledge of HIV-positive status prior to pregnancy and lower coverage of ART prior to pregnancy.
- Strengthen retention in care and adherence to ARV medications among pregnant women living with HIV throughout pregnancy and postpartum. This will ensure that more and more women are virally suppressed throughout pregnancy, delivery and the postpartum period.
- Maintain viral load monitoring and return of results for pregnant WLHIV in order to ensure women are virally suppressed and that both low-level and high-level viraemia are responded to timeously. Sending viral load results directly to mothers via SMS or MomConnect should be continued or introduced.
- 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.
- Continuation of promotion of male circumcision and condom use as strategies for primary prevention of maternal and congenital syphilis warrants further focus for inclusion in existing prevention strategies.

Suggestions for 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 or new HIV infections and viral suppression respectively.
- Triangulate HIV prevalence estimates from the ANC survey with other data sources such as HSRC’s HIV Prevalence, Incidence, Behaviour, and Communication Survey (SABSSM) in order to understand the drivers of the declining HIV prevalence apparent in this survey.
- Triangulate ANC attendance, viral load coverage and viral suppression data with DHIS and DHS in order to better understand trends observed in the survey.
- Triangulate DTG coverage data with DHIS data at the national and provincial level.
- 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.

- 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 PEP as an intervention for preventing STIs in the country.
- Measure syphilis prevalence directly in the next survey in order to validate syphilis positivity from medical records.
- Conduct evaluations to determine the completeness of data concerning key survey indicators as well as the quality of HIV testing data from medical records with a few complementing ANC surveys with routine ANC data. Key variables will include HIV testing, ART use, and viral load completion and results.

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Annexure 1: Data collection form

NATIONAL 2022 ANTENATAL HIV SENTINEL SURVEY, SOUTH AFRICA								
<p style="margin: 0;">NATIONAL INSTITUTE FOR COMMUNICABLE DISEASES Division of the National Health Laboratory Service</p>	 12A034	EPISODE NO. FOR LAB USE						
	FACILITY NAME: EC AMADIBA CLINIC	FACILITY CODE: 12A034						
SPECIMEN	B. SPECIMEN INFORMATION B1. Location: YAF AHS B2. Test: ANS		B3. Collection Date <table style="width: 100%; border: 1px solid black; text-align: center;"> <tr> <td style="width: 20px; height: 20px;">D</td> <td style="width: 20px; height: 20px;">D</td> <td style="width: 20px; height: 20px;">M</td> <td style="width: 20px; height: 20px;">M</td> <td style="width: 40px; height: 20px;">2022</td> </tr> </table>	D	D	M	M	2022
	D	D	M	M	2022			
		 ANCHSS2200001						
SURVEY ENROLMENT	C. SURVEY ENROLMENT QUESTIONS <i>(Note: the following section should be completed for all women including those who refuse to participate in the survey)</i>							
	C1. Are you pregnant? <input type="checkbox"/> Yes <input type="checkbox"/> No							
	C2. How old are you (in years)? <input type="text"/> <input type="text"/>							
	C2. OFFICE USE ONLY ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨							
	C3. What is your race? <input type="checkbox"/> African <input type="checkbox"/> Asian <input type="checkbox"/> Coloured <input type="checkbox"/> White <input type="checkbox"/> Other							
	C4. What is your relationship with the father of your child? <input type="checkbox"/> Married <input type="checkbox"/> Living together/co-habiting <input type="checkbox"/> Not living together but in a relationship <input type="checkbox"/> No relationship							
C5. Is this your first antenatal clinic visit? <input type="checkbox"/> Yes <input type="checkbox"/> No 2 nd visit <input type="checkbox"/> No 3 rd visit <input type="checkbox"/> No ≥4 th visit								
CONSENT I	D. CONSENT FOR PARTICIPATING IN CURRENT SURVEY							
	It has been explained to me and I understand what the antenatal survey is about, and:		Date <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 2022 D D M M					
	I agree to participate in the survey <input type="checkbox"/> Yes <input type="checkbox"/> No		Participant Signature					
	Witness (complete this section only if participant is unable to read and write)							
I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely		Date <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 2022 D D M M						
Witness Signature								
CONSENT II	E. CONSENT FOR STORAGE AND FUTURE USE OF YOUR INFORMATION AND BLOOD SAMPLE							
	I agree to the use of blood specimen for future studies <input type="checkbox"/> Yes <input type="checkbox"/> No		Date <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 2022 D D M M					
	Participant Signature							
	Witness (complete this section only if participant is unable to read and write)							
I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely		Date <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 2022 D D M M						
Witness Signature								
Nurse's name (please print as it appears on ID)		Date <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 2022 D D M M						
Nurse's Signature								

NATIONAL HIV SURVEILLANCE FOCAL CONTACT NUMBER: 084 855 7867

F. DEMOGRAPHICS AND CLINICAL INFORMATION (All participants)

DEMOGRAPHICS AND CLINICAL

F1. How old is the father of the baby? Don't know F1. OFFICE USE ONLY 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9

F2. Is the father of this baby 5 years older than you? Yes No Don't know

F3. What is your highest completed level of education? None Primary Secondary Tertiary

F4. How many times have you been pregnant including this current pregnancy? 1 (one) 2 (two) 3 (three) 4 (four) and above

F5. How many live babies have you delivered? 0 (zero) 1 (one) 2 (two) 3 (three) 4 (four) and above

F6. Gestational age at today's visit (in weeks) (review medical record) F6. OFFICE USE ONLY 0 1 2 3 4 0 1 2 3 4 5 6 7 8 9

F7. Gestational age at first antenatal care booking (in weeks) (review medical record) F7. OFFICE USE ONLY 0 1 2 3 4 0 1 2 3 4 5 6 7 8 9

G. HIV STATUS (All participants)

HIV STATUS

G1. Have you been tested for HIV before this pregnancy, if yes when? Never tested before this pregnancy Tested ≤ 12 months before this pregnancy Tested 13-24 months before this pregnancy Tested > 25 months before this pregnancy

G2. What is the participant's latest HIV status (from her medical records)? No HIV status recorded Participant refused testing Test not offered Discrepant result Negative from test done in previous ANC visit Negative from test done today HIV positive

G3. If HIV positive, when was she first diagnosed HIV positive? Positive before this pregnancy Tested positive during previous antenatal visit Tested positive today

G4. If reported HIV positive, ask this question:
 Has the participant ever taken ARVs? If yes, when did she start: No Yes, initiated today Yes, initiated before pregnancy (i.e. on ART at time of first ANC visit) Yes, initiated in prior ANC visit at 1st trimester Yes, initiated in prior ANC visit at 2nd trimester Yes, initiated in prior ANC visit at 3rd trimester

G5. If taking ARVs, which ARV regimen is she taking (review medical records) Dolutegravir (DTG)-based regimen (TLD) Efavirenz (EFV)-based regimen Second line regimen Other (Specify)

H. VIRAL LOAD TESTING (HIV Positive participants only)

HIV VIRAL LOAD

H1. Is there a record showing viral load (VL) test was done for the participant during this pregnancy? Yes No Not due for VL

H2. If VL is done, is the VL test result documented? Yes No Pending (in lab)

H3. If VL is documented, what is the most recent VL result from test done this pregnancy? ≤ 49 copies/ml 50-999 copies/ml ≥1000 copies/ml

H4. Date of most recent VL test:

I. PRE-EXPOSURE PROPHYLAXIS (PrEP) - PrEP is a pill taken by HIV negative people to reduce the risk of getting HIV (HIV Negative participants only)

PrEP

I1. In the past 12 months, I had: More than 1 sexual partner Had only 1 sexual partner

I2. My current sexual partner(s) is/are: HIV positive HIV negative Don't know his/their status Don't have sexual partner

I3. Have you had sex under the influence of drugs or alcohol in the past 6 months? Yes No

I4. Have you had sexually transmitted diseases in the last 6 months? Yes No

I5. Have you ever heard of PrEP before today? Yes No

I6. Have you been taking PrEP before this pregnancy? Yes No

I7. Are you currently taking PrEP? Yes No

J. SYPHILIS TESTING (All participants)

SYPHILIS

J1. Is there a record showing syphilis test was done for the participant during this pregnancy? Yes No

J2. If syphilis test was done, what type of test was done? TPHA TPAb RPR VDRL
 Rapid (Specify) Other (Specify)

J3. If syphilis test was done, what is the result? Positive Negative Pending (in lab) Not in file

J4. If the result was positive, did the patient receive treatment for syphilis? Yes No

J5. If she did receive treatment, was this Benzathine Penicillin (Bicillin)? Yes No

Annexure 2: Information sheet

Information sheet for participating in the current survey

INTRODUCTION

Hello. I am Sr. /Ms/Mr., a nurse working in the antenatal care unit of this clinic. I would like to find out if you are willing to participate in a study called “the Antenatal survey”. This study is being supported by the National Institute for Communicable Diseases and the National Department of Health.

WHY AND HOW ARE WE DOING THIS STUDY?

We are asking about 36,000 pregnant women to take part in this study. We are doing this study to find out how many pregnant women have HIV. HIV is an infection that can lead to serious negative influences on your and your baby’s health. This study will help the government to know whether the money spent to prevent HIV is having an effect and what more needs to be done. We are also doing this study to find out what care pregnant women receive from the clinic, if needed: Did the pregnant women get HIV and Syphilis tests during her antenatal visit/s? Did they get treatment for HIV and Syphilis? They also need to know how much medicine is needed to treat pregnant women for HIV and syphilis.

If you agree to participate in this study, a sample of blood will be drawn from you for HIV testing. In addition, this study will interview you and collect information from your medical record. Your answers and information from the medical record will be written in a form and will be held in strict confidentiality. We will send the blood and the form to the laboratory for testing.

BEING PART OF THE STUDY AND STOPPING THE STUDY

If you agree to take part in this study, we will first ask you questions. You do not have to answer all the questions. We will then collect 8.5mls (2 teaspoons) of blood from you for HIV testing. If this is your first antenatal visit, a separate blood sample in addition to the blood collected for routine testing will be collected for the study. At any time during the questions or before the blood specimen collection you can refuse to participate or ask us to stop. We will then stop.

Participation in this study is voluntary. If you do not want to take part in this study you will still get the same care in the clinic that you would get if the study was not here. The questions and the blood test will be done today in a separate part of the clinic.

RETURNING OF TEST RESULTS

We will ask you to provide us your full name and mobile phone number to contact you to return to the clinic for your HIV test result from blood collected as part of the survey. This information will be captured on a paper-based register. This register will be kept in a locked cabinet for one year and will be accessed by the antenatal nurse only. The register will be destroyed after a year.

Your HIV results will not be given over the phone and your personal information will not be shared with anyone.

The nurse will contact you only if you did not test for HIV during your antenatal visit or the laboratory test result completed as part of the survey has a different test result. You will receive two SMS reminders: the first reminder will be sent two weeks after testing and will ask you to come and collect your results. A second reminder will be sent if the results have not been collected after 8 weeks.

If the two tests have different results, we will ask you to repeat the test, and the final result will be confirmed 14 days after the second blood draw. If you don’t want to collect your results you can’t take part in the testing section of the study but you can take part in the interview.

PRIVACY

Your answers to the questions will be marked on a form. Your name will not be written down when you answer the questions. Only a code will be linked to your answers. So all your answers will be kept private. As the study sponsors, the National Department of Health, National Institute for Communicable Diseases and other sponsors may monitor or audit survey activities in conjunction with the Wits Research Ethics Committee. The reason for this would be to make sure that the survey is being done the way it is supposed to be done. It would also make sure that your rights and health are protected. Your personal medical information will be kept confidential.

The blood test results will be kept at the laboratory where they do the test as part of the everyday service. The HIV test results may be known to the nurse at the clinic who will give you the result but not to other nurses in other clinics. All forms that we fill today for the survey will be stored at NICD in a secure room in a locked cabinet for 5 years. Only the

POTENTIAL BENEFITS

You will know your HIV test result. If you are HIV positive then you can get medicine to treat HIV through the routine health care system immediately. If you are HIV negative then you will get further counselling on HIV prevention methods.

Pregnant women are also routinely offered HIV testing at the clinic. You can test for HIV at the clinic any time you want. Participation in the study is not a requirement for receiving HIV testing, or for receiving HIV treatment.

POTENTIAL HARM

The questions and the blood sample collection will take about 15 minutes of your time. If we ask questions that are a problem for you, you do not have to answer them.

The blood test can cause a little pain. The good thing about the blood test is that you can get to know your HIV result. This means that you can then get the right care for yourself, and your baby.

Your name and answers will be kept private. We do not share your individual information with anyone in the clinic. Please ask me if you have any problems with the questions, or with the study.

WILL YOU GET ANY PAYMENT FOR BEING IN THE STUDY?

You will not receive any money or food for being part of the study. You do not have to pay to be in the study.

PEOPLE DOING THE STUDY

If you have any questions or problems about the research study please phone the person in charge of the study. His name and telephone numbers are:

Professor Adrian J Puren (overall Investigator)
Head of Department
Centre for HIV and STI
NICD
1 Modderfontein Road, Sandringham, Gauteng, 2031
Tel: +2711386 6328 Mobile +27829088048

ANCHSS2022 WhatsApp Hotline: 067 148 4493

Or for *Ethical or Rights questions contact:*

Professor CB Penny, Chairperson of the Human Research Ethics Committee (Medical) at the University of Witwatersrand, on telephone no. 011 717 2301, or by e-mail at Clement.Penny@wits.ac.za.

Appendix A2: INFORMATION SHEET FOR STORAGE AND FUTURE USE OF BLOOD SAMPLE AND PARTICIPANT INFORMATION

INTRODUCTION

There may be some remaining blood taken from you during the study that might be useful for future studies. You are being asked to agree to the storage of the remaining blood sample for future study.

WHAT WILL THE REMAINING SAMPLES BE USED FOR?

Your remaining blood samples may be used for future studies. We would like to store remaining samples. We cannot give more details of what will be looked at, as this is not yet known. We assure you that no research will be done on the samples without the approval of the Research Ethics board.

CONFIDENTIALITY

We will not leave your name or contact information on the blood sample. However, the barcode and tracking number will be on the specimen.

WHERE WILL MY SAMPLES BE STORED?

Your samples will be stored in special facilities that are safe and secure at NICD. Only approved researchers can have access to the samples. A research ethics board must approve any future research study using the blood samples from you. This board watches over the human safety and rights.

HOW LONG WILL YOU KEEP MY SAMPLES?

We store samples for up to five years. If new evidence is found, an extension to keep the sample for an additional five years will be requested from the local authority. Specimens will be destroyed at the end of this period.

DOES STORAGE OF MY SAMPLES BENEFIT ME?

There are no direct benefits to you if you allow us to store the samples. However studies on the stored samples may benefit the society in the future as we learn more about HIV infection.

WHAT ARE THE RISKS?

We don't anticipate any risk as the samples are not linked with your name. Your blood sample will not be sold.

WHAT ARE MY RIGHTS?

Allowing your samples to be stored is voluntary. You may decide not to have your samples stored other than what is needed for the main study. If you decide not to allow your blood samples to be stored, you can still participate in the main study. You will also receive the same care in the clinic that you would get if the study was not here.

WHAT WILL I BE INFORMED OF?

You will be informed of all test results conducted at this health facility as well as all follow-up tests conducted as a part of this survey.

Further questions or concerns:

For any question on the storage of your samples you may contact the principle Investigator. His name and telephone numbers are given to you.

Annexure 3: Characteristics of enrolled women

Characteristic	HIV negative n (%)	HIV positive n (%)	Total n (%)
Age			
15-19	4600 (15.9)	389 (3.46)	4989 (12.5)
20-24	8267 (30.1)	1702 (15.6)	9969 (26.1)
25-29	7051 (26.6)	2862 (26.6)	9913 (26.6)
30-34	4439 (17.1)	3133 (29.5)	7572 (20.5)
35-49	2745 (10.3)	2640 (24.9)	5385 (14.3)
Population group			
Black	22957 (85.3)	10276 (96.0)	33233 (88.2)
Asian	252 (0.9)	77 (0.8)	329 (0.9)
Mixed race	3039 (10.6)	285 (2.3)	3324 (8.3)
White	551 (2.1)	38 (0.3)	589 (1.6)
Other	221 (0.9)	21 (0.3)	242 (0.7)
Missing	82 (0.3)	29 (0.3)	111 (0.3)
Education			
None	180 (0.7)	97 (0.8)	277 (0.7)
Primary	2279 (8.6)	1025 (9.8)	3304 (8.9)
Secondary	19442 (70.9)	8080 (75.1)	27522 (72.0)
Tertiary	4506 (17.3)	1256 (12.0)	5762 (15.9)
Missing	695 (2.5)	268 (2.4)	963 (2.5)
Relationship with partner who fathered current pregnancy			
Married	4382 (17.1)	1363 (13.1)	5745 (16.0)
Living together as married	6477 (25.9)	3034 (30.3)	9511 (27.1)
Not living together but in a relationship	15089 (52.8)	5839 (51.8)	20928 (52.5)
No relationship	964 (3.5)	393 (3.9)	1357 (3.6)
Missing	190 (0.7)	97 (0.9)	287 (0.8)
Age difference with partner who fathered current pregnancy			
<5 years	15321 (55.9)	5603 (51.8)	20924 (54.8)
≥5 years	10339 (39.0)	4372 (41.3)	14711 (39.6)
Unknown	1045 (3.7)	582 (5.3)	1627 (4.1)
Missing	397 (1.5)	169 (1.6)	566 (1.5)
Province			
Eastern Cape	3509 (9.3)	1717 (11.9)	5226 (10.0)
Free State	1979 (4.6)	859 (5.3)	2838 (4.8)
Gauteng	4120 (28.9)	1478 (27.3)	5598 (28.5)
KwaZulu-Natal	5784 (16.6)	3417 (25.9)	9201 (19.2)
Limpopo	2653 (10.2)	637 (6.5)	3290 (9.2)
Mpumalanga	2328 (7.5)	1038 (8.8)	3366 (7.9)
Northern Cape	1393 (2.4)	249 (1.1)	1642 (2.0)

North West	1947 (6.7)	672 (6.1)	2619 (6.5)
Western Cape	3389 (13.8)	659 (7.1)	4048 (11.9)
ANC visit			
Follow up	18215 (65.7)	7501 (69.1)	25716 (66.6)
First ANC visit	8267 (32.0)	2974 (28.6)	11241 (31.0)
Missing	620 (2.4)	251 (2.4)	871 (2.4)
Parity			
1	11682 (42.2)	2014 (18.3)	13696 (35.6)
≥ 2	14965 (56.2)	8541 (80.2)	23506 (62.8)
Missing	455 (1.7)	171 (1.5)	626 (1.6)
Gravidity			
< 2	10374 (37.3)	1555 (14.1)	11929 (30.9)
≥ 2	15948 (58.9)	8832 (82.9)	24780 (66.2)
Missing	780 (2.9)	339 (3.1)	1119 (2.9)
Trimester at booking			
First	6273 (22.7)	2496 (23.0)	8769 (22.8)
Second	15939 (59.1)	6151 (57.9)	22090 (58.8)
Third	1803 (6.8)	735 (6.8)	2538 (6.8)
Missing	3087 (11.5)	1344 (12.3)	4431 (11.7)

Annexure 4: Detailed provincial reports

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Eastern Cape

Sample size realization and demographic characteristics

The sample size realization in Eastern Cape was 98.0% (5 221). At district level, sample size realization ranged from 92.0% (806) in NMM to 108.0% (573) in Buffalo City. The total number of women enrolled was lowest in Joe Gqabi at 499 (9.5% of provincial total) and the highest in O.R. Tambo 1114 (21.3% of provincial total). The majority of participants were aged 25–29 years (25.3%) and aged 20–24 years (25.0%) (Figure 1).

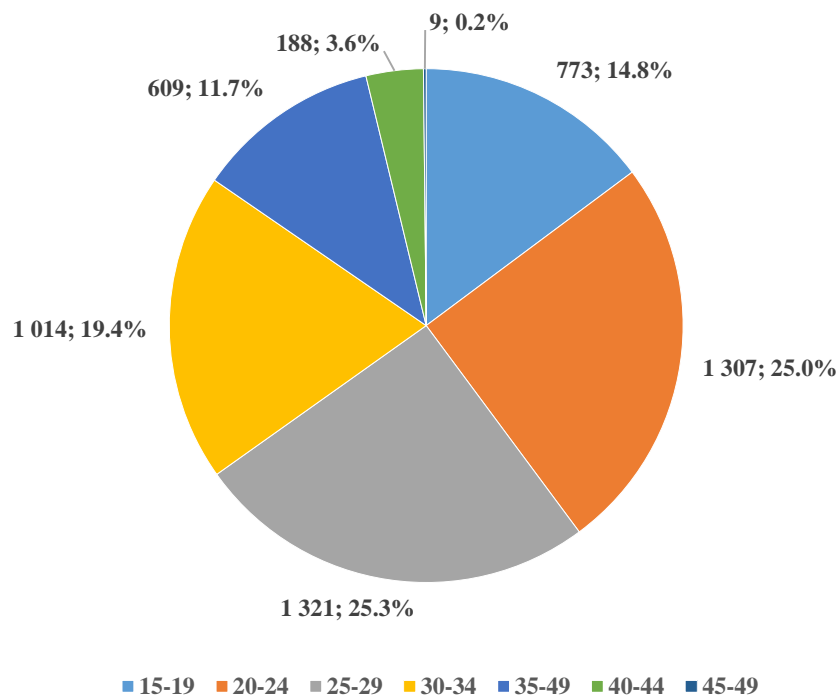
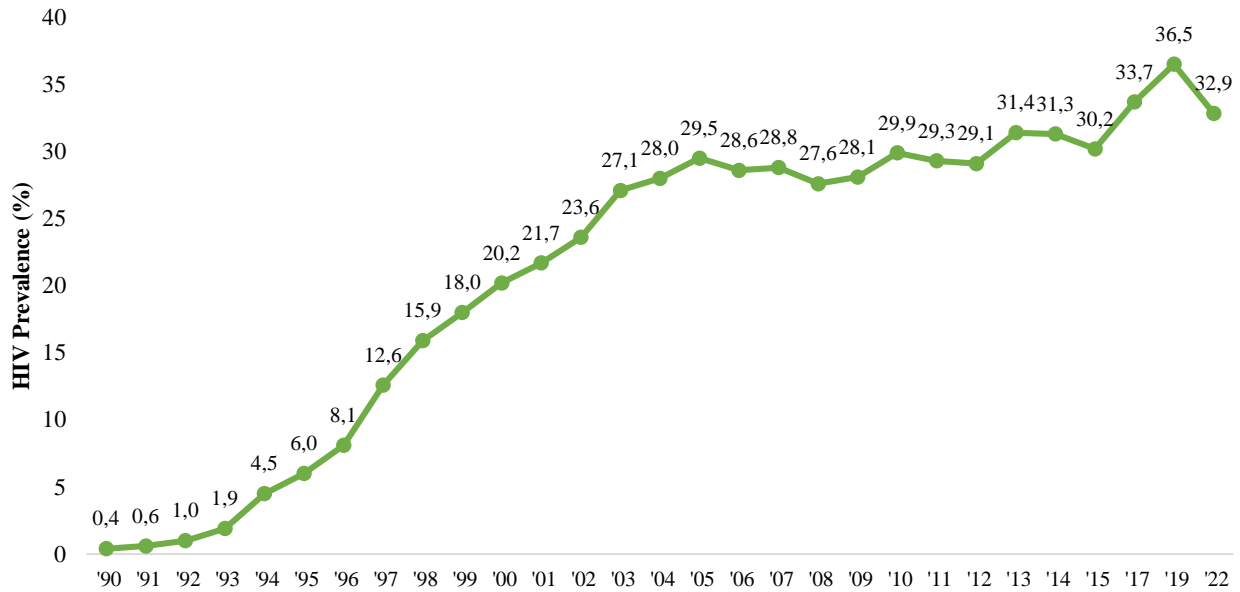


Figure 29: Distribution of survey participants by five-year age groups – Eastern Cape, Antenatal HIV Sentinel Survey, 2022

HIV prevalence

The overall HIV prevalence in Eastern Cape was 32.9% (95% CI: 31.5–34.2) (Figure 2). This figure was lower by 3.6% points from the prevalence reported in 2019 (36.5%, 95% CI: 35.2–37.9).

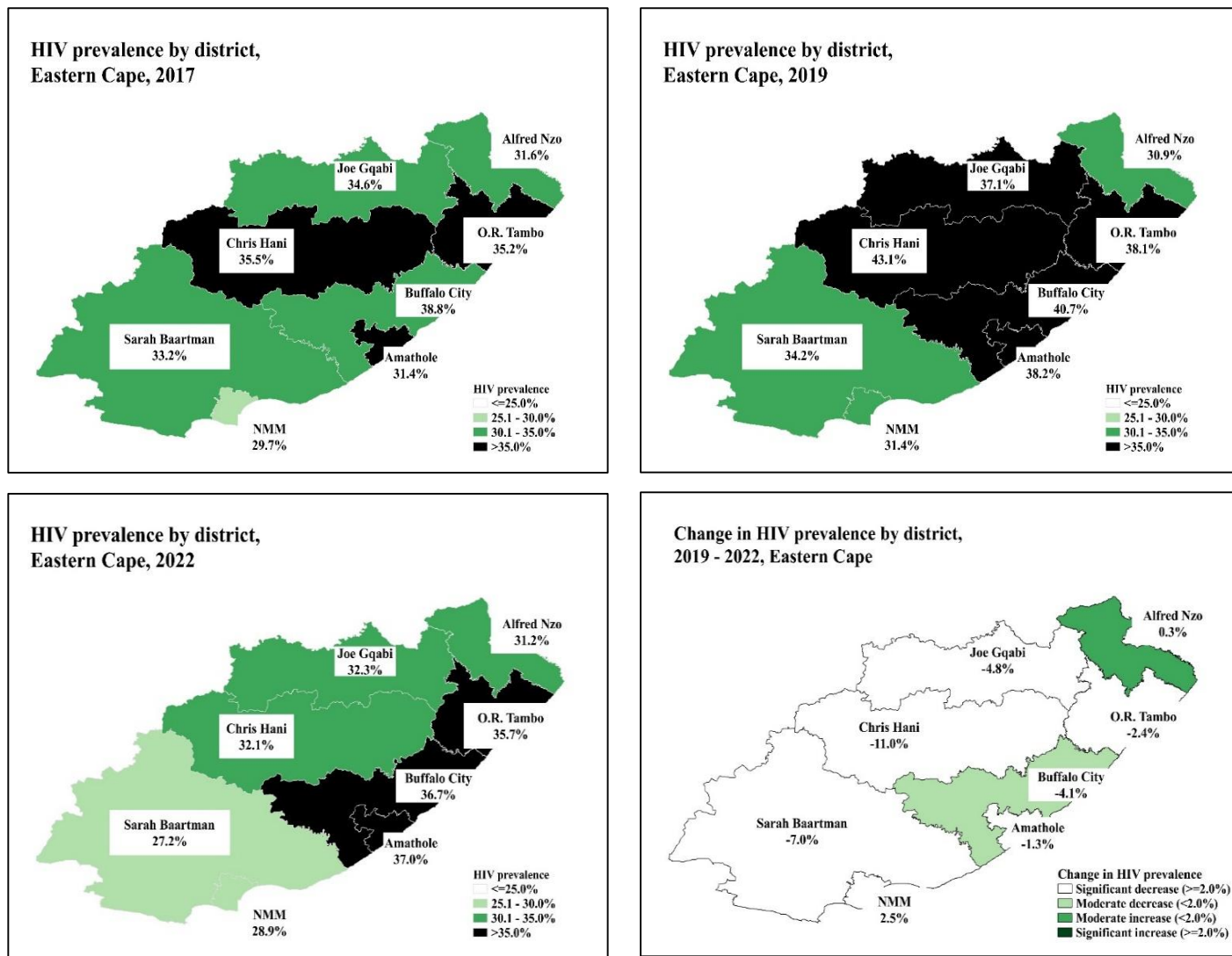


The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees

Figure 30: The HIV epidemic curve among antenatal women, Eastern Cape, 1990 – 2022
Antenatal HIV Sentinel Survey

HIV prevalence by district

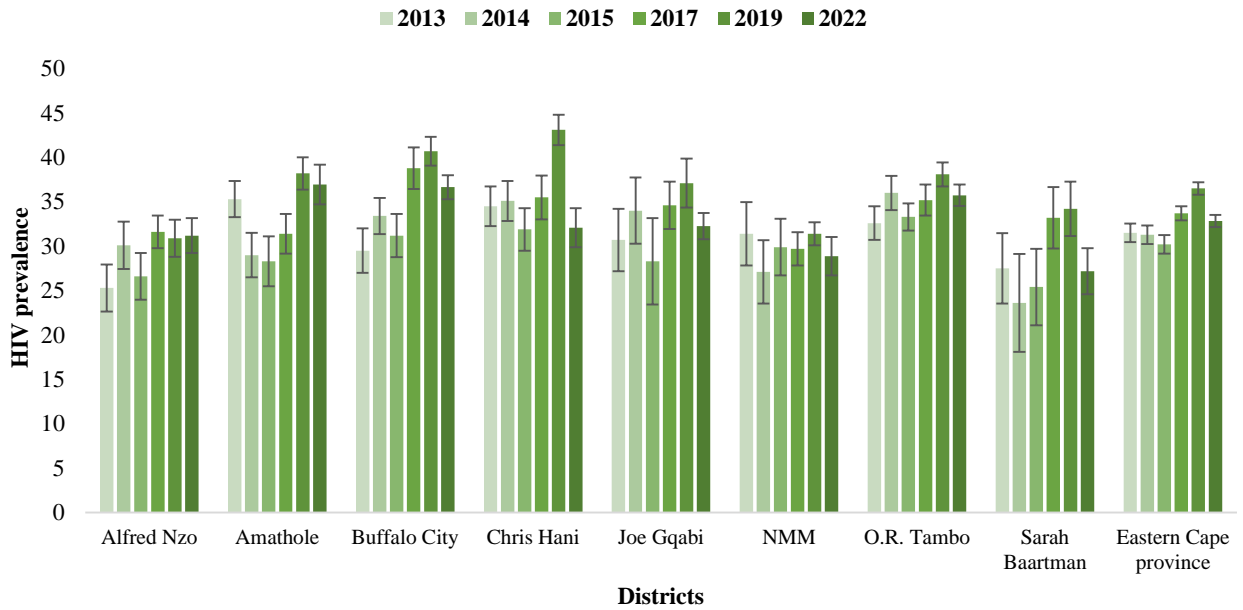
The district with the highest prevalence in Eastern Cape was Amathole (37.0%, 95% CI: 32.7 – 41.4) followed by Buffalo City (36.7%, 95% CI: 34.1 – 39.3) in 2022 (Figure 3). The Sarah Baartman district had lowest HIV prevalence in this province at 27.2% (95% CI: 22.4 – 32.6). Overall, the HIV prevalence has decreased in almost all districts (except for Alfred Nzo) compared to the prevalence in 2019.



NMM: Nelson Mandela Metro

Figure 31: Change in district HIV prevalence estimates, 2017 – 2022, Antenatal HIV Sentinel Survey, Eastern Cape

Figure 4 and Table 1 shows the prevalence trend from 2013 to 2022. In 2022, the district prevalence ranged from 27.2% (Sarah Baartman) to 37.0% in (Amathole). In Eastern Cape, even though there appears to be year-to-year fluctuation in the prevalence trend, overall, prevalence has increased in almost all districts (except Nelson Mandela Metro (NMM)) from the level in 2013 to 2019 with a decrease in 2022.



The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees. The confidence intervals are wide due to small sample size at district level

Figure 32: HIV prevalence trend by district, 2013 – 2022, Antenatal HIV Sentinel Survey, Eastern Cape

Table 1: HIV prevalence by district in the Eastern Cape province, Antenatal HIV Sentinel Survey, 2013 to 2022

District	2013		2014		2015		2017		2019		2022	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Alfred Nzo	25.3	20.5 - 30.9	30.1	20.5 - 30.9	26.6	21.8 - 32.1	31.6	28.1 - 35.3	30.9	27.0 - 35.2	31.2	27.5 - 35.1
Amathole	35.3	31.4 - 39.4	29.0	24.8 - 34.6	28.3	23.2 - 34.2	31.4	27.2 - 36.0	38.2	34.7 - 41.8	37.0	32.7 - 41.4
Buffalo City	29.5	24.8 - 34.6	33.4	31.4 - 39.4	31.2	26.7 - 36.2	38.8	34.3 - 43.5	40.7	37.6 - 43.9	36.7	34.1 - 39.3
Chris Hani	34.5	30.2 - 39.0	35.1	30.2 - 39.0	31.9	27.4 - 36.8	35.5	30.8 - 40.5	43.1	39.8 - 46.5	32.1	27.9 - 36.6
Joe Gqabi	30.7	24.2 - 38.0	34.0	24.2 - 38.8	28.3	19.7 - 38.8	34.6	29.5 - 40.0	37.1	31.9 - 42.7	32.3	29.4 - 35.2
NMM	31.4	24.9 - 38.9	27.1	24.9 - 38.9	29.9	24.0 - 36.5	29.7	26.1 - 33.4	31.4	28.9 - 34.0	28.9	24.8 - 33.3
O.R. Tambo	32.6	29.0 - 36.4	36.0	28.8 - 36.4	33.3	30.4 - 36.4	35.2	31.8 - 38.7	38.1	35.5 - 40.8	35.7	33.4 - 38.1
Sarah Baartman	27.5	20.4 - 35.9	23.6	14.5 - 36.1	25.4	17.9 - 34.8	33.2	26.8 - 40.4	34.2	28.5 - 40.5	27.2	22.4 - 32.6
Eastern Cape	31.5	29.4 - 33.5	31.3	29.4 - 33.5	30.2	28.2 - 32.3	33.7	32.2 - 35.3	36.5	35.2 - 37.9	32.9	31.5 - 34.2

The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees

PMTCT cascade – the first and second 95

In Eastern Cape, 99.7%⁴ (4 895) of women attending ANC were tested for HIV or had been offered HIV testing based on medical records review data. Majority of the ANC attendees (99.96%, 4 792) accepted the offer or already knew their HIV-positive status. Of the 1 717 participants found to be HIV-positive by EIA test, 97.2% (1 668) already knew their HIV-positive status at the time of the survey. Among those who knew their HIV-positive status, excluding 23 participants whose treatment status was not reported, 98.9% (1 645) had initiated ART at the time of the survey (Figure 5). By district, the lowest knowledge of HIV status was in Joe Gqabi (95.7%) and the highest was in Sarah Baartman (98.6%). Among those who knew their status, ART initiation ranged from 98.3% (Alfred Nzo) to 99.5% (Buffalo City). Initiation of ART increased between 2017 and 2022 in all districts.

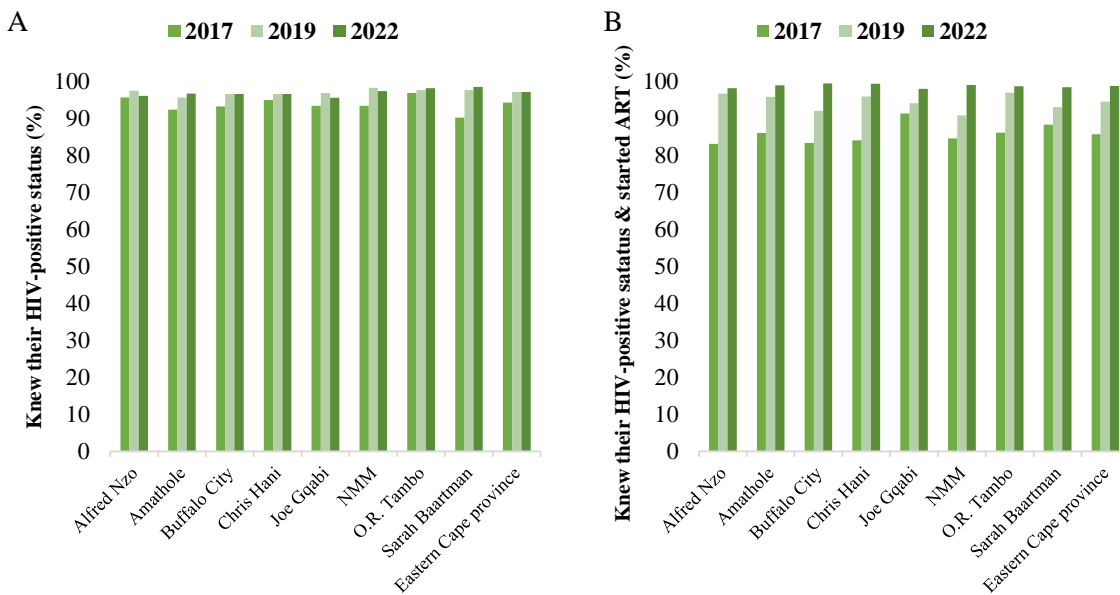


Figure 33: Knowledge of HIV-positive status and ART initiation at the time of the survey by district, in the 2017, 2019 and 2022 Antenatal HIV Sentinel Surveys, Eastern Cape

Knowledge of HIV-positive status and ART initiation before pregnancy

Knowledge of HIV status before pregnancy in the Eastern Cape (78.4%) was slightly above the national average (78.1%). Among those who knew their HIV-positive status prior to pregnancy and had a reported treatment status (1 115), 925 (83.0%) started ART before pregnancy (Figure 6). By district, knowledge of HIV status before pregnancy ranged from 71.5% in Joe Gqabi to 85.9% in Alfred Nzo districts in 2022. District NMM had the lowest ART initiation before pregnancy (78.3%) while Alfred Nzo had the highest ART initiation before pregnancy (at 89.3%). In all districts there was a decline in the proportion of HIV positive women who had initiated ART prior to pregnancy, a finding also observed at national level.

⁴318 (6.1%) missing response excluded when calculating percentage

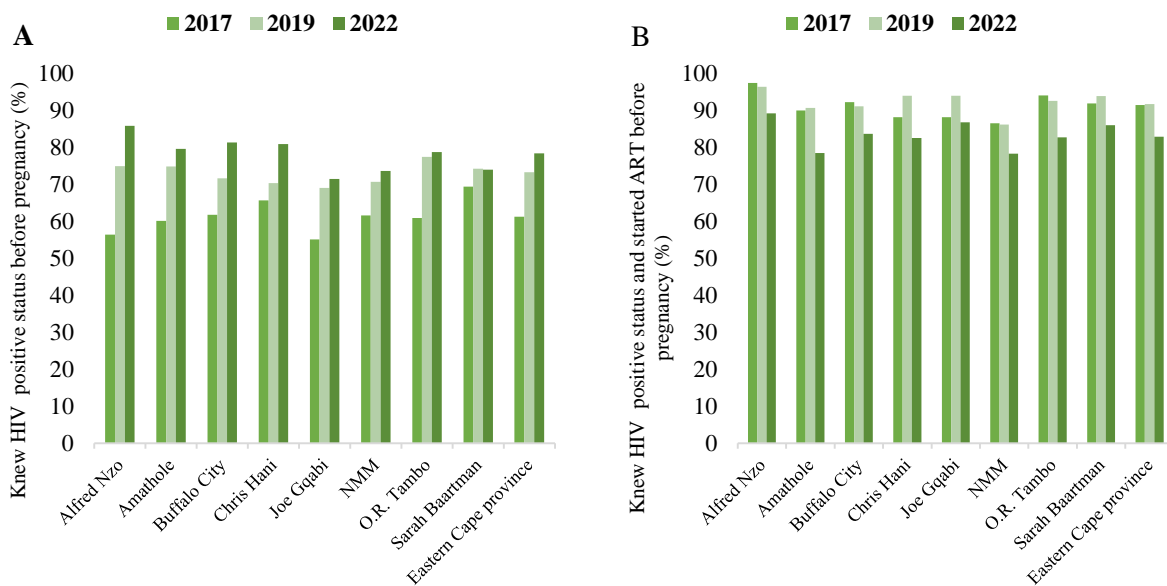


Figure 34: Knowledge of HIV-positive status and ART initiation before pregnancy by district, in the 2017, 2019 and 2022 Antenatal HIV Sentinel Surveys, Eastern Cape

Viral Load Monitoring

Viral load testing coverage was 89.0% (998 out of 1121 HIV positive women with viral load coverage data available) in Eastern Cape and it was greater than 83.0% across all districts in the province (Figure 7). 79.0% (788/998) had received their viral load results among those who had a viral load test done and were due for a viral load test. Of those who had a viral load test done and received results, viral suppression (<50 copies/ml) was at 70.7% (557/788).

At a district level, viral load testing coverage was the lowest at Joe Gqabi (83.2%, 95% CI: 73.3 – 89.9) and highest in Amathole (94.4%, 95% CI: 89.6 – 97.1). Only 68.9% (95% CI: 54.1 – 80.7) had received viral load test results in Alfred Nzo while Amathole had 87.5% (95% CI: 81.7 – 91.7) receive results. The lowest viral load suppression was 58.7% (95% CI: 47.4 – 69.2) at Sarah Baartman and the highest was 77.6% (95% CI: 71.2 – 82.9) at O.R. Tambo.

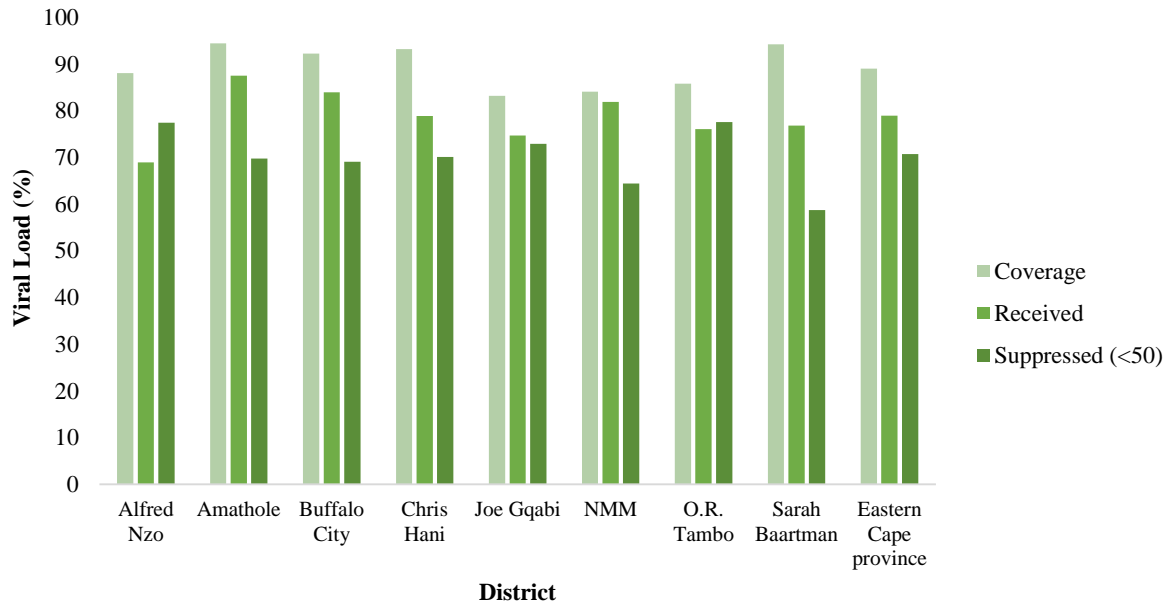


Figure 35: Viral load testing among antenatal women by district, in the 2022 HIV Antenatal Survey, Eastern Cape

PrEP Coverage

In Eastern Cape, 38.5% (1 162 out of 3 021) HIV negative women were PrEP eligible. The highest PrEP eligibility by district in Eastern Cape was in Joe Gqabi (47.6%, 95% CI: 42.1 – 53.1). Of those who were PrEP eligible and whose prior use of PrEP was reported, 4.1% (95% CI: 3.2 – 5.1) were on PrEP before pregnancy (Figure 8). Prior use of PrEP was the lowest in the Amathole district where none of women in the survey had taken PrEP prior to pregnancy. Among those who were PrEP eligible and whose current PrEP use was reported, current use of PrEP was 3.6% (95% CI: 2.7 – 4.7). By district, none of the participating PrEP eligible women were currently taking PrEP in Joe Gqabi district and the highest proportion of people currently taking PrEP was in the Alfred Nzo district (9.6%, 95% CI: 5.4 – 16.4).

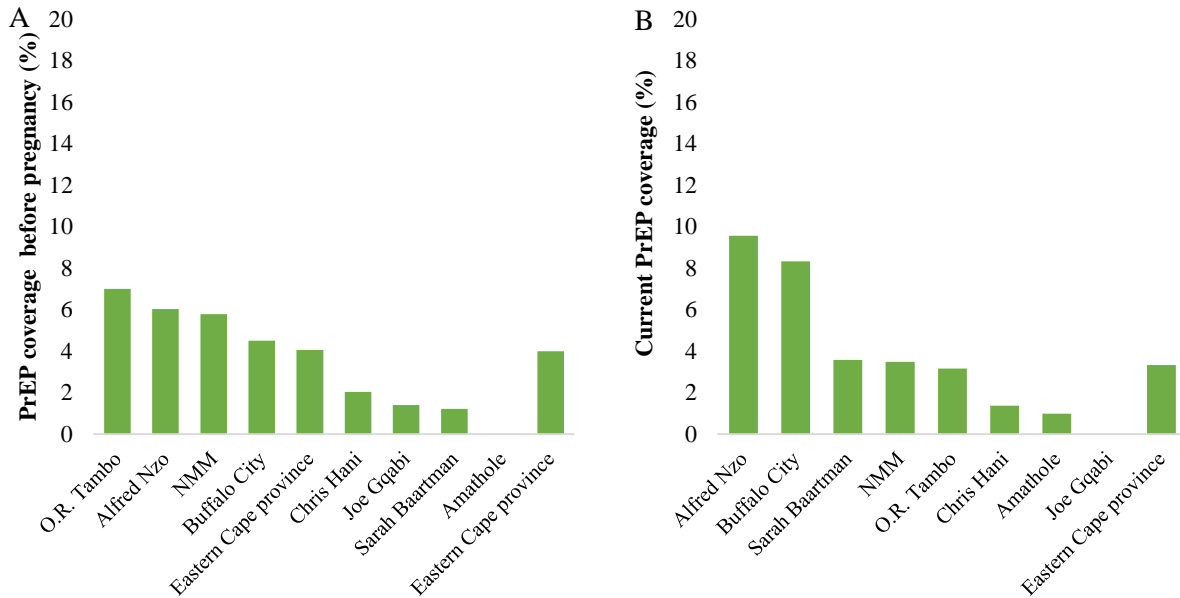


Figure 36: PrEP coverage before pregnancy (A) and during current pregnancy (B) by district, in the 2022 Antenatal HIV Sentinel Survey, Eastern Cape

Early ANC attendance

Less than a quarter (23.8%) of participants in Eastern Cape attended their first-ANC-visit before or at 12 weeks of pregnancy (Figure 9), while more than half (55.8%) of the participants in Eastern Cape attended their first-ANC-visit before 20 weeks of gestational age. At a district level, Alfred Nzo had the lowest attendance of ANC before 20 weeks (42.7%) and the highest was in Sarah Baartman (66.2%). With regards to other factors, attendance of ANC before 20 weeks was lower than the national average (61.0%) among women with high (≥ 4) gravidity (51.9%), single women (41.7%), participants with no education (45.7%) or primary education (54.7%), adolescent girls (50.0%) and women older than 40 years (51.8%).

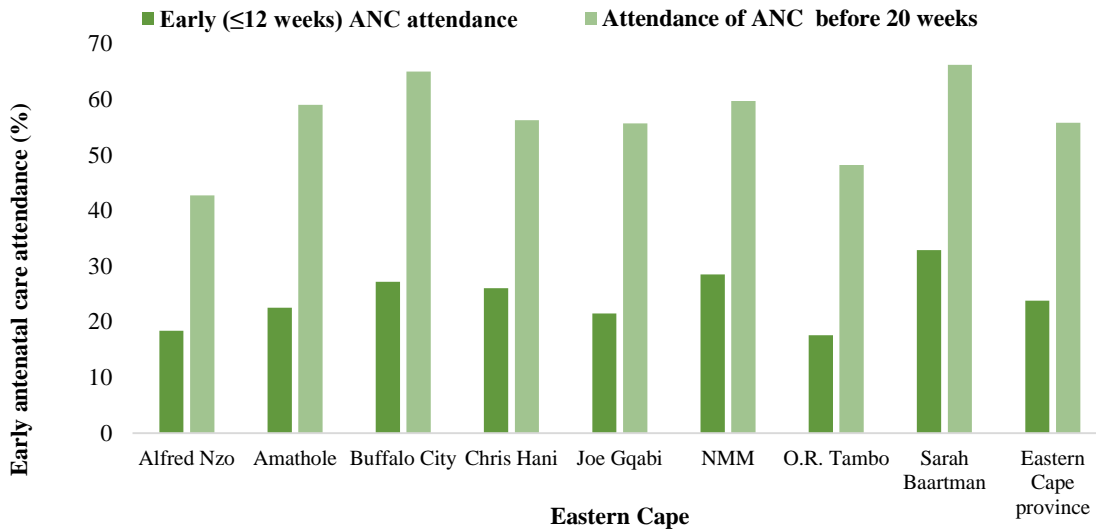
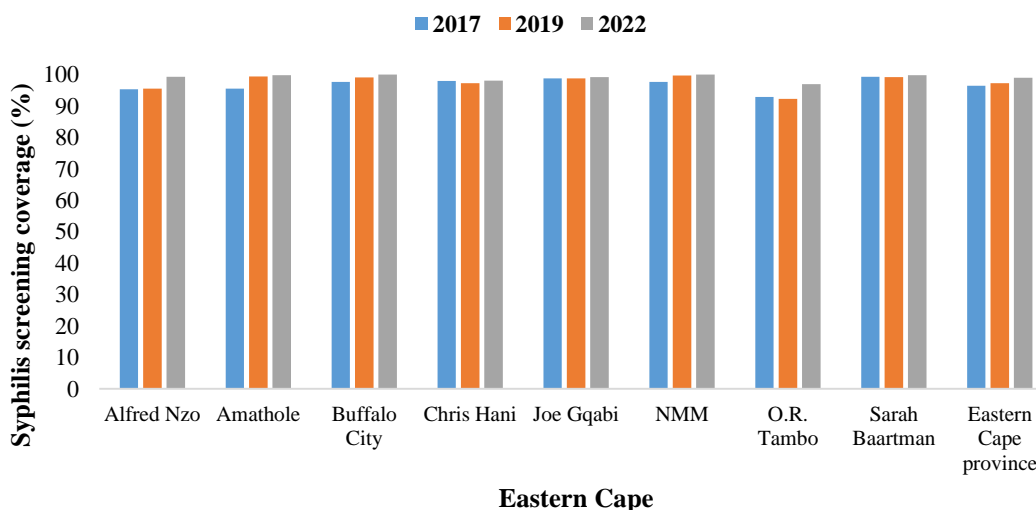


Figure 37: Early attendance of antenatal care by province in the 2022 Antenatal HIV Sentinel Survey, Eastern Cape

Maternal syphilis screening and treatment coverage

In Eastern Cape, maternal syphilis screening coverage was 98.9%, showing an increase in syphilis screening coverage from 2019 (97.2%) (Figure 10). All districts in Eastern Cape had syphilis screening coverage greater than 95% with the lowest being 97.0% (O.R. Tambo).

In terms of missing data, 2.4% of the participants had missing data for syphilis screening coverage. If we assume that all missing responses indicate the participant did not receive the screening test, and include them as such in the denominator, the overall coverage for syphilis screening in Eastern Cape decreases from 98.9% to 96.6%.



The denominator syphilis screening coverage was the number of women who completed the questionnaire. Missing data excluded
Figure 38: Maternal syphilis screening coverage among antenatal women, in the 2017, 2019, 2022 Antenatal HIV Survey, Eastern Cape

Among the women who had syphilis screening, 3.2% (153) were positive, 84.6% (4 072) were negative, 11.7% (564) had pending results, 0.5% (26) did not have results in file (Figure 11). Of those who had a test, combined 12.3% had missing results (either due to pending in the laboratory or due to not being in patient file). The lowest percent of missing results was in NMM (1.8%) and the highest was in O.R. Tambo (26.0%).

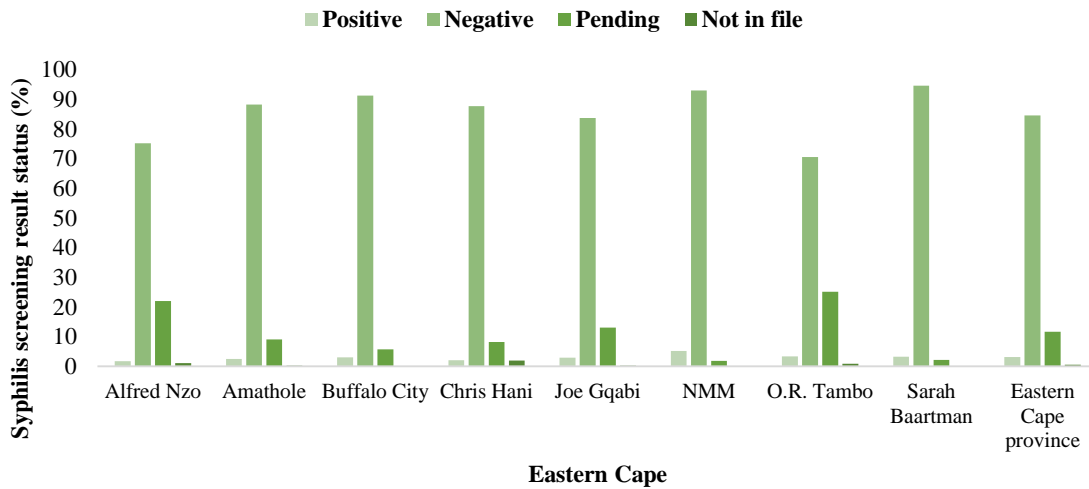
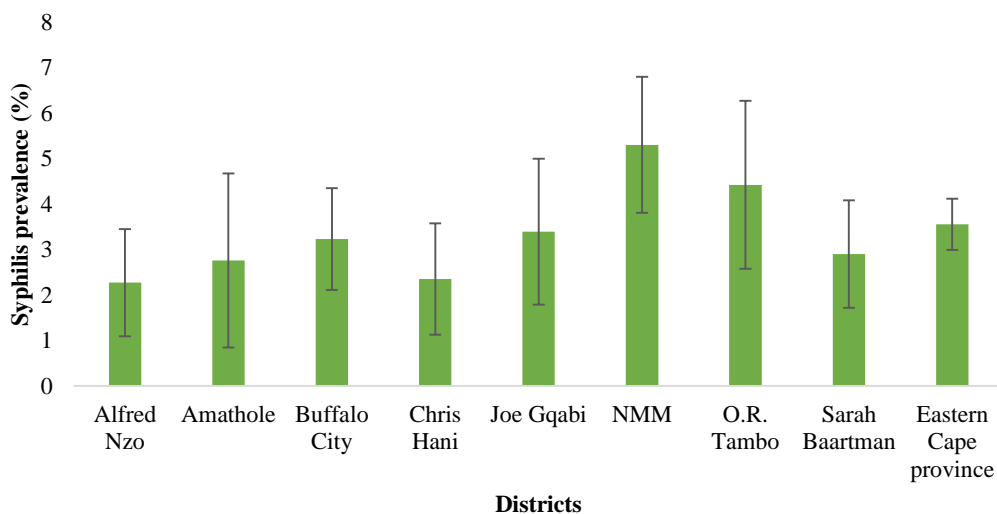


Figure 39: Maternal syphilis screening test result status by district, in the 2022 Antenatal HIV Sentinel Survey, Eastern Cape

After excluding the pending results and the results not in file, the prevalence of syphilis (per medical record review data) among those who had syphilis test results available, was 3.6% (95% CI: 3.0 – 4.2) in Eastern Cape (Figure 12). The highest syphilis prevalence was in NMM at 5.3% (95% CI: 4.0 – 7.0) and the lowest was in Alfred Nzo at 2.3% (95% CI: 1.4 – 3.8).



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

Figure 40: Maternal syphilis prevalence among antenatal women, in the 2022 HIV Antenatal Survey, Eastern Cape

Of the 140 participants who were syphilis-positive and whose syphilis treatment status was reported, 88.2% (135) received treatment for syphilis. Of those treated for syphilis and had type of treatment data reported (128), 96.9% (124) were treated with at least one dose of BPG (Figure 13). If we assume that all missing responses mean that the subjects did not receive treatment for syphilis and include the missing data in the denominator, the coverage of syphilis treatment decreases from 96.4% to 88.2% and the treatment with BPG decreases from 96.9% to 91.9%.

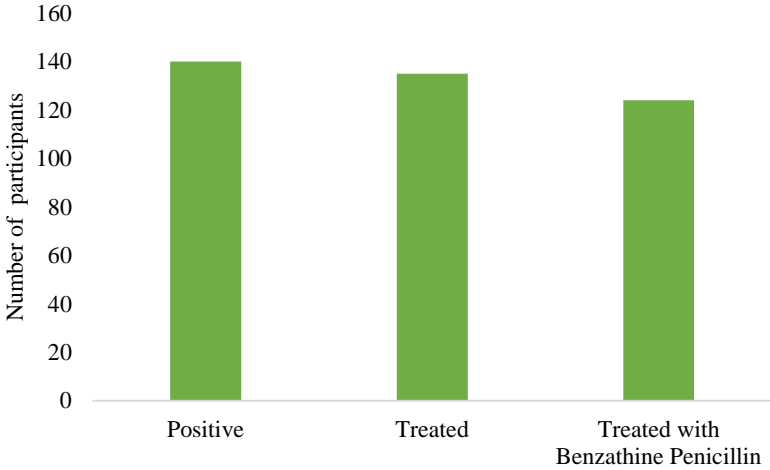


Figure 41: Syphilis treatment cascade among antenatal women, in the 2022 HIV Antenatal Survey, Eastern Cape

Free State

Sample size realization and demographic characteristics

The sample size realization in Free State was 104.0% (2 834). At district level, sample size realization ranged from 86.0% (556) in Mangaung to 115.0% (435) in Xhariep. The total number of women enrolled was lowest in Xhariep at 435 (15.3% of provincial total) and the highest in Thabo Mofutsanyana at 696 (24.5% of provincial total). Most of the participants were aged 25–29 years (26.4%) and aged 20–24 years (26.2%) (Figure 14).

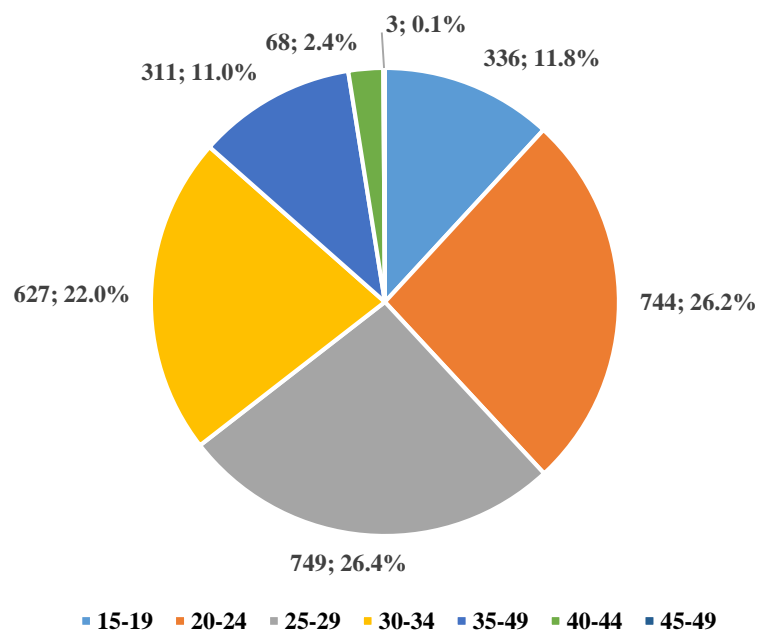
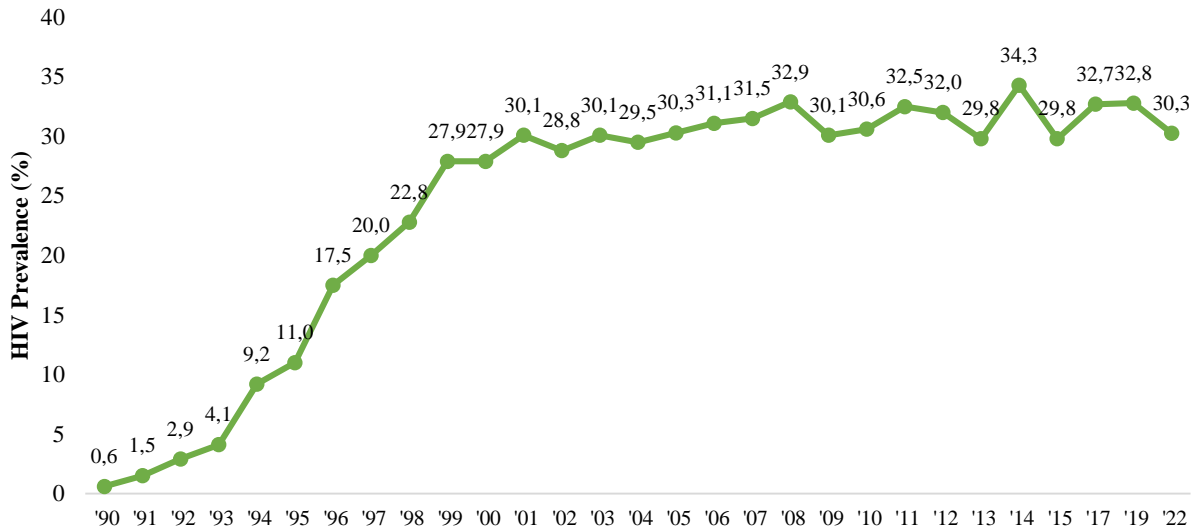


Figure 42: Distribution of survey participants by five-year age groups – Free State, Antenatal HIV Sentinel Survey, 2022

HIV prevalence

The HIV prevalence in Free State fluctuated between 30% to 34% between 2009 and 2019 (Figure 15). In 2022, the HIV prevalence was 30.3% (95% CI: 28.6 – 32.1), which is lower by 2.5% points from the prevalence reported in 2019 (32.8%, 95% CI: 31.3 – 34.3).



The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees

Figure 43: The HIV epidemic curve among antenatal women, Free State, 1990 – 2022, Antenatal HIV Sentinel Survey

HIV prevalence by district

In Free State, Thabo Mofutsanyane (35.2%, 95% CI: 31.7 – 38.9) had the highest HIV prevalence followed by Lejweleputswa (31.2%, 95% CI: 27.8 – 34.8) (Figure 16). In this province, the district with the lowest HIV prevalence was Xhariep at 25.1% (95% CI: 20.1 – 30.8). Overall, compared to the 2019 prevalence, the HIV prevalence has decreased in almost all districts, excluding Thabo Mofutsanyane, which had a prevalence of 32.1% (95% CI: 29.4 – 34.8) in 2019).

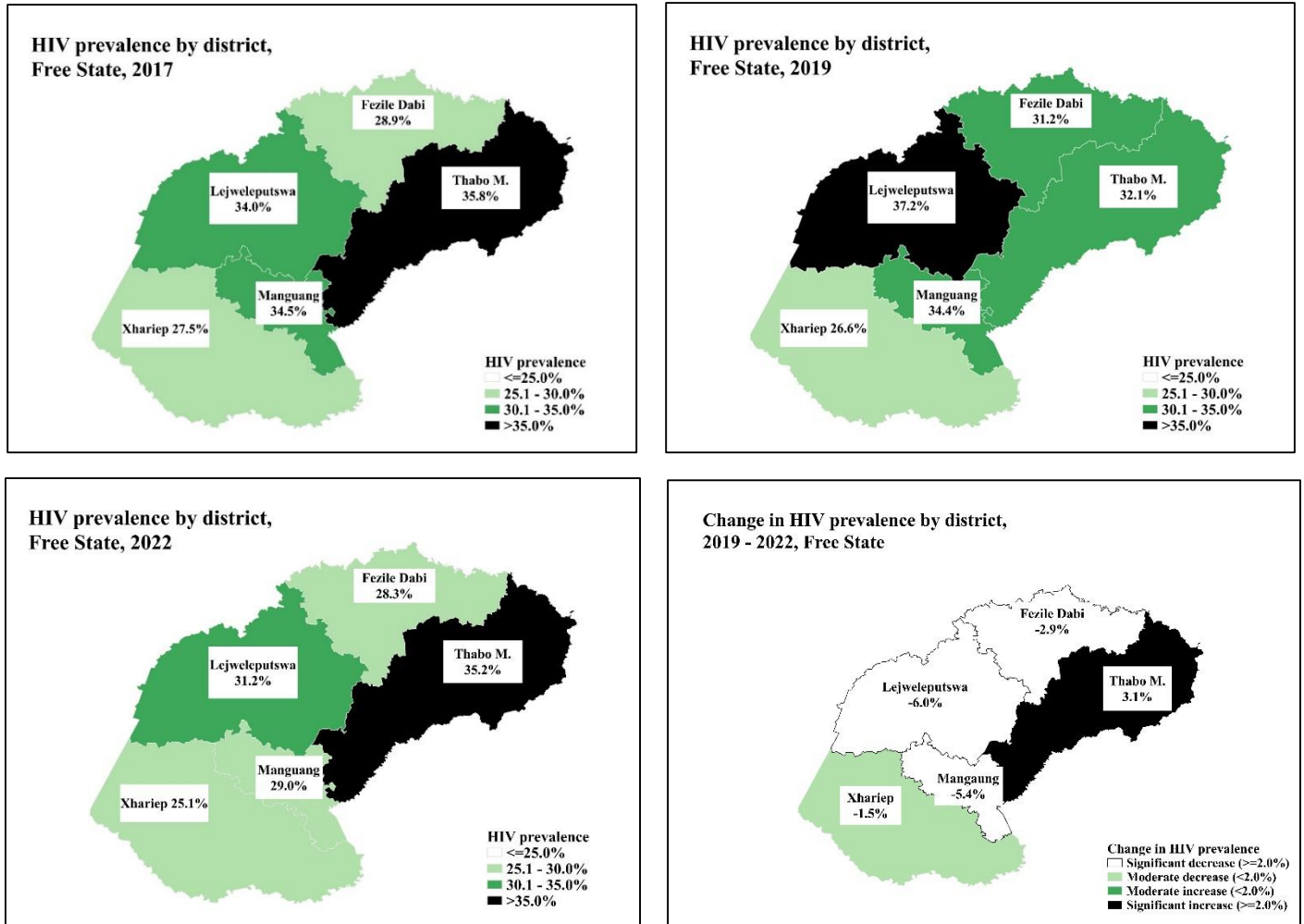
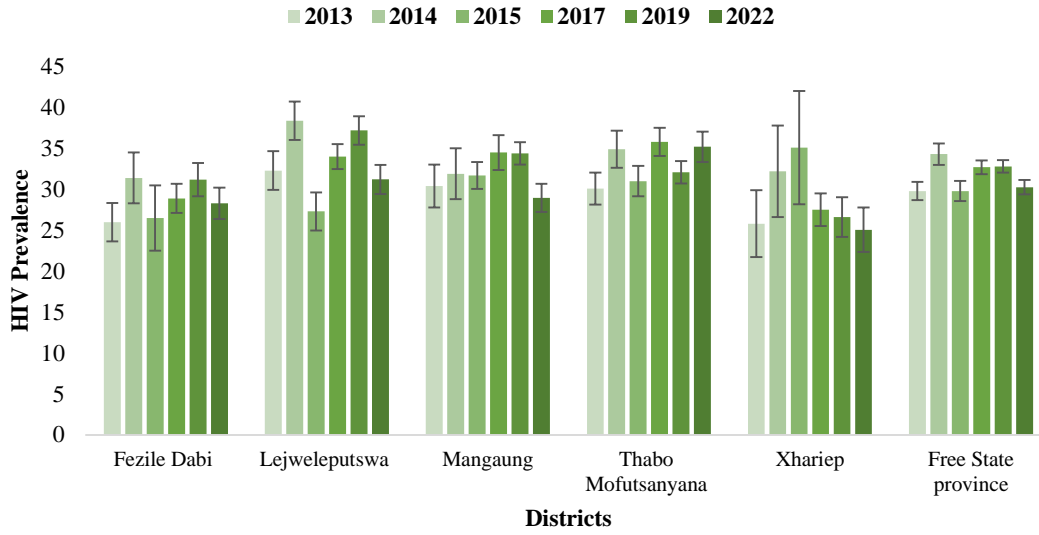


Figure 44: Change in district HIV prevalence estimates, 2017–2022, Antenatal HIV Sentinel Survey, Free State

Figure 17 and Table 2 shows the prevalence trend from 2013 to 2022. In 2022, district prevalence ranged from 25.1% (Xhariep) to 35.2% in (Thabo Mofutsanyana). In Free State, there appears to be a year-to-year fluctuation in the prevalence trend. Compared to 2013, the prevalence has decreased in 3 of the 5 districts in 2022.



The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees. The confidence intervals are wide due to small sample size at district level

Figure 45: HIV prevalence trend by district, 2013–2022, Antenatal HIV Sentinel Survey, Free State

Table 2: HIV prevalence by district in the Free State province, Antenatal HIV Sentinel Survey, 2013 to 2022

District	2013		2014		2015		2017		2019		2022	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Fezile Dabi	26.0	21.6 - 30.8	31.4	25.6 - 37.8	26.5	19.4 - 35.1	28.9	25.5 - 32.5	31.2	27.4 - 35.4	28.3	24.7 - 32.2
Lejweleputswa	32.3	27.9 - 37.2	38.4	33.9 - 43.1	27.3	23.0 - 32.1	34.0	31.1 - 37.1	37.2	33.8 - 40.6	31.2	27.8 - 34.8
Mangaung	30.4	25.5 - 35.8	31.9	26.1 - 38.3	31.7	28.5 - 35.0	34.5	30.5 - 38.8	34.4	31.8 - 37.2	29.0	25.7 - 32.5
Thabo Mofutsanyana	30.1	26.4 - 34.1	34.9	30.6 - 39.5	31.0	27.5 - 34.8	35.8	32.4 - 39.2	32.1	29.4 - 34.8	35.2	31.7 - 38.9
Xhariep	25.8	18.6 - 34.6	32.2	22.3 - 44.2	35.1	22.7 - 49.8	27.5	23.8 - 31.6	26.6	22.1 - 31.6	25.1	20.1 - 30.8
Free State	29.8	27.6 - 32.0	34.3	31.8 - 36.9	29.8	27.5 - 32.3	32.7	31.1 - 34.4	32.8	31.3 - 34.3	30.3	28.6 - 32.1

The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees

PMTCT cascade – the first and second 95

Based on medical records review, 99.9%⁵ (2 730) of HIV women attending ANC were offered HIV testing or already knew their HIV-positive status. Most of the ANC attendees (99.9%, 2 703) accepted the offered test or already knew their HIV-positive status. From the 859 participants found to be HIV-positive by EIA test, 97.8% (840) already knew their HIV-positive status at the time of the survey (Figure 18). By district, Xhariep had the lowest knowledge of HIV status (95.4%) while Lejweleputswa had the highest knowledge of HIV status (99.0%).

Among those who knew their HIV-positive status, excluding 9 participants whose treatment status was not reported, 98.9% (831) had initiated ART at the time of the survey. At a district level, of those who knew their status, ART initiation ranged from 97.9% (Fezile Dabi) to 100.0% (Xhariep). Initiation of ART at the time of the survey increased between 2019 and 2022 in all districts.

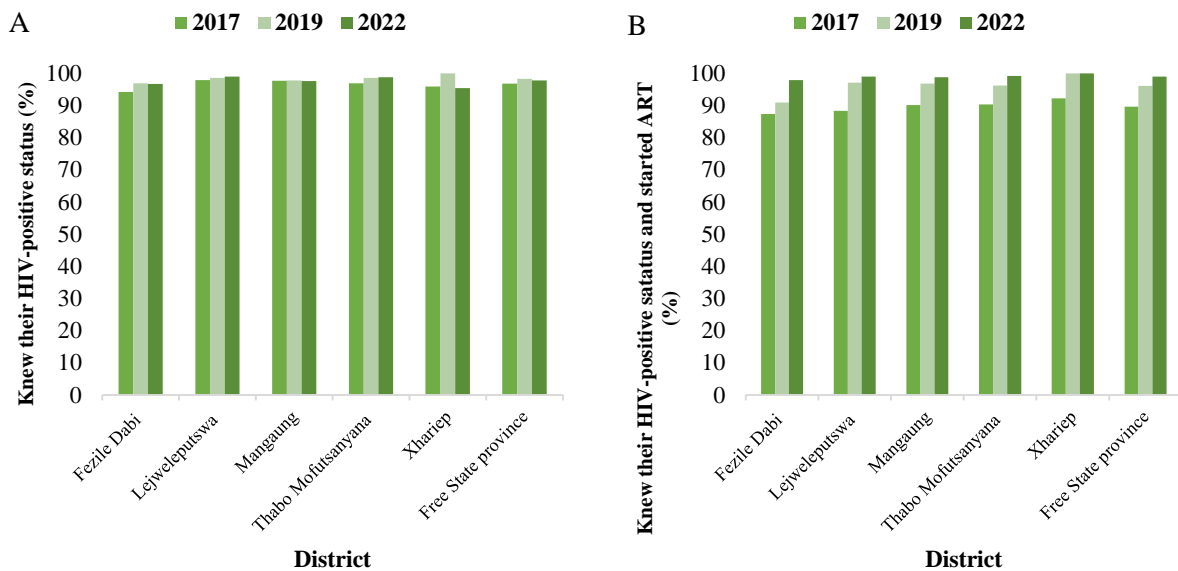


Figure 46: Knowledge of HIV-positive status and ART initiation at the time of the survey by district, in the 2017, 2019 and 2022 Antenatal HIV Sentinel Surveys, Free State

Knowledge of HIV-positive status and ART initiation before pregnancy

In Free State, knowledge of HIV status before pregnancy was 79.2%, which was slightly above the national average (78.1%). Among those who knew their HIV-positive status prior to pregnancy and had a reported treatment status (619), 550 (88.9%) started ART before pregnancy (Figure 19).

At district level, knowledge of HIV status before pregnancy ranged from 72.6% (Mangaung) to 90.4% (Xhariep) in 2022. The Fezile Dabi district had the lowest ART initiation before pregnancy (84.0%) and the highest ART initiation before pregnancy was in Xhariep (97.8%).

⁵106 (3.7%) missing response excluded when calculating percentage

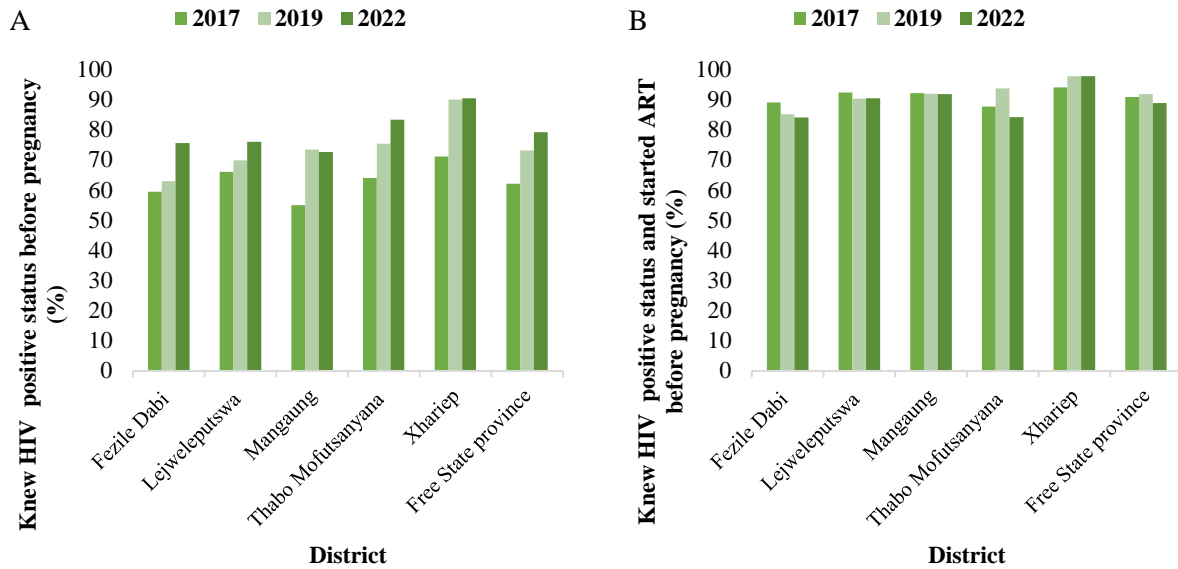


Figure 47: Knowledge of HIV-positive status and ART initiation before pregnancy by district, in the 2017, 2019 and 2022 Antenatal HIV Sentinel Surveys, Free State

Viral Load Monitoring

In Free State, viral load testing coverage was 87.8% (568 out of 647) and it was greater than 80.0% across all districts in the province (Figure 20). Among those who had a viral load test done and were due for a viral load test, 76.4% (434/568) had received their viral load results. Of those who had a viral load test done and received results, viral suppression (<50 copies/ml) was at 76.7% (333/434).

At a district level, Fezile Dabi had the lowest viral load testing coverage (83.0%, 95% CI: 72.5 – 90.0) and the highest viral load testing coverage was in Thabo Mofutsanyana (93.5%, 95% CI: 90.5 – 95.6). In Mangaung only 62.5% (95% CI: 51.6 – 72.3) had received viral load test results while in Thabo Mofutsanyana 89.5% (95% CI: 84.5 – 93.1) had received results. Viral load suppression was the lowest in Mangaung at 70.8% (95% CI: 61.1 – 78.9) and the highest was 79.1% (95% CI: 69.8 – 86.1) at Xhariep.

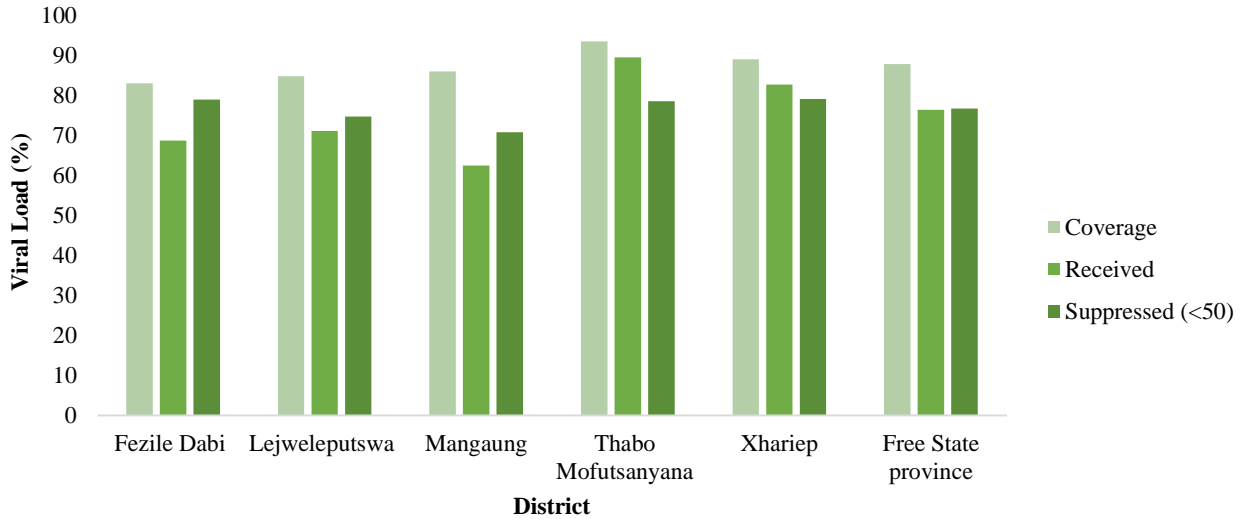


Figure 48: Viral load testing among antenatal women by district, in the 2022 HIV Antenatal Survey, Free State

PrEP Coverage

In Free State, 44.0% (769 out of 1 748) of HIV negative women were PrEP eligible. Of those who were PrEP eligible and whose prior use of PrEP was reported, prior use of PrEP was 4.9% (95% CI: 3.8 – 6.3) (Figure 21). Prior use of PrEP was the lowest at Xhariep (0.9%, 95% CI: 0.3 – 3.0) and the highest at Lejweleputswa (6.0%, 95% CI: 3.5 – 10.2). Among PrEP eligible women whose current use of PrEP was reported, 3.9% (95% CI: 2.9 – 5.4) were currently taking PrEP. The Fezile Dabi district had the lowest current use of PrEP pregnancy (0.8%, 95% CI: 0.2 – 3.9).

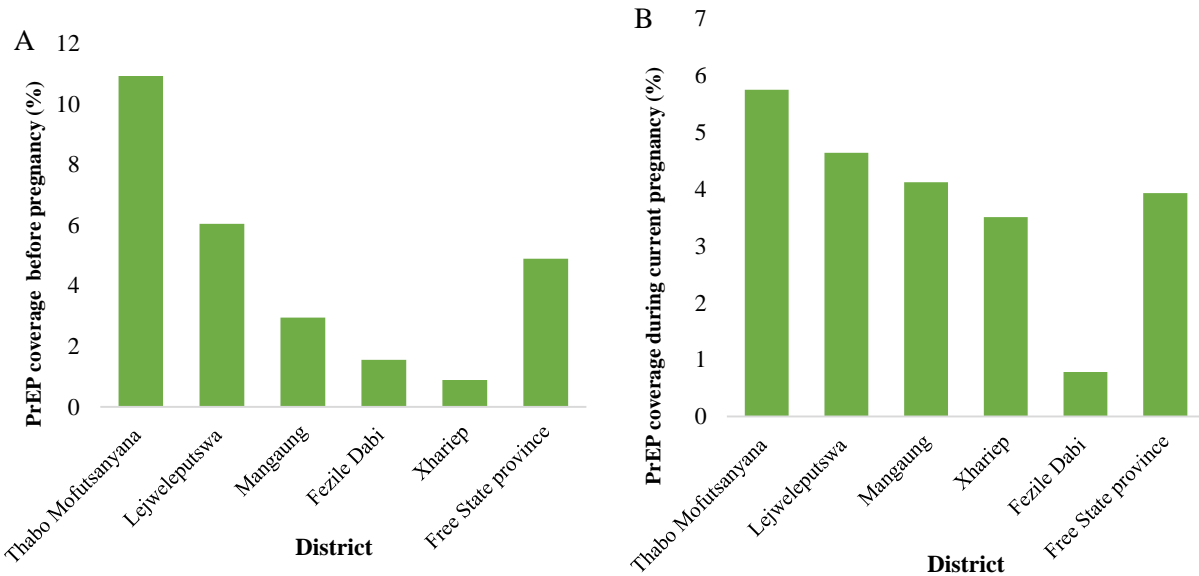


Figure 49: PrEP coverage before pregnancy (A) and during current pregnancy (B) by district, in the 2022 Antenatal HIV Sentinel Survey, Free State

Early ANC attendance

In Free State, 25.6% of the participants in Free State attended their first-ANC-visit before or at 12 weeks of pregnancy (Figure 22). While more than half (59.9%) of the participants in the province attended their first-ANC-visit before 20 weeks of gestational age. At a district level, the lowest attendance of ANC before 20 weeks was in Lejweleputswa (55.6%) and the highest was in Xhariep (71.8%). In terms of other factors, attendance of ANC before 20 weeks was lower than the national average (61.0%) among women with high (≥ 4) gravidity (50.4%), single women (57.1%), or primary education (54.5%), adolescent girls (52.8%) and women older than 40 years (53.7%). Attendance of ANC before 20 weeks was higher than the national average (61.0%) among women with no education (75.0%).

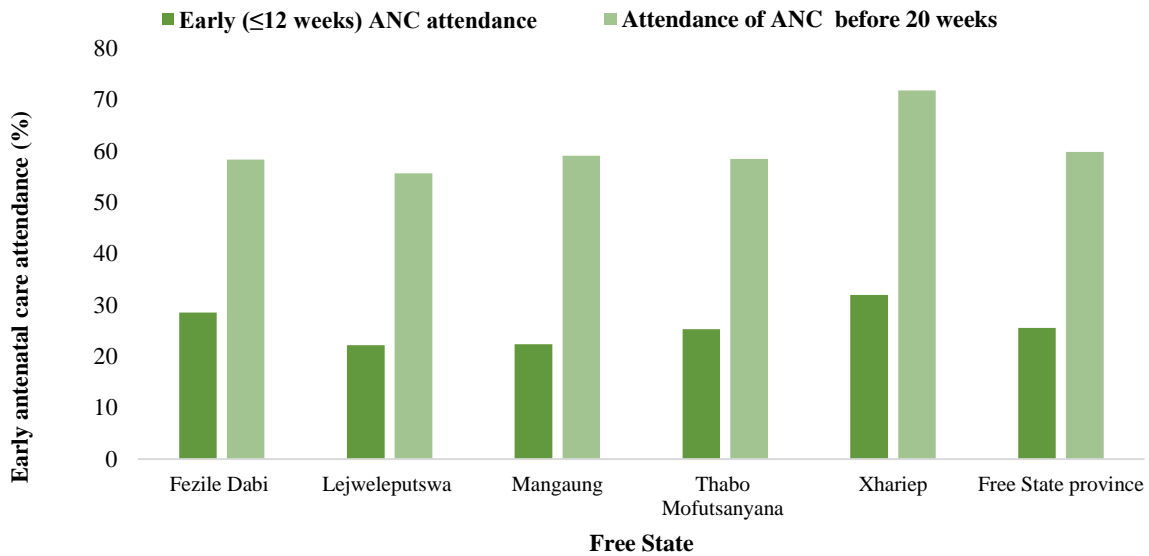
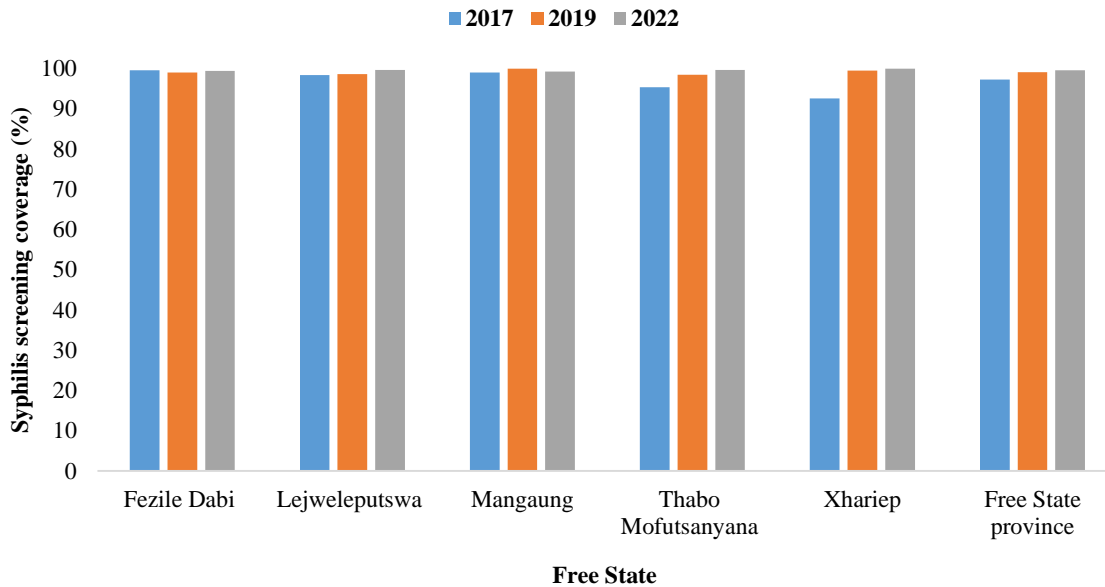


Figure 50: Early attendance of antenatal care by province in the 2022 Antenatal HIV Sentinel Survey, Free State

Maternal syphilis screening and treatment coverage

In Free State, maternal syphilis screening coverage was 99.6%, which shows a slight increase in syphilis screening coverage from 2019 (99.1%) (Figure 23). All districts in Free State had syphilis screening coverage greater than 99.0% with the lowest being 99.3% (Manguang).

With regards to missing data, for syphilis screening coverage 0.9% of the participants had missing data. If we assume that all missing responses indicate the participant did not receive the screening test, and include them as such in the denominator, coverage for syphilis screening in Free State decreases from 99.6% to 98.8%.



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

Figure 51: Maternal syphilis screening coverage among antenatal women, in the 2017, 2019, 2022 Antenatal HIV Survey, Free State

Of the women who had syphilis screening, 3.3% (89) were positive, 88.0% (1 368) were negative, 8.5% (230) had pending results, 0.2% (5) did not have results in file (Figure 24). Of those who had a test, combined 8.7% had missing results (either due to pending in the laboratory or due to not being in patient file). The lowest percent of missing results was in Xhariep (3.1%) and the highest was in Fezile Dabi (20.3%).

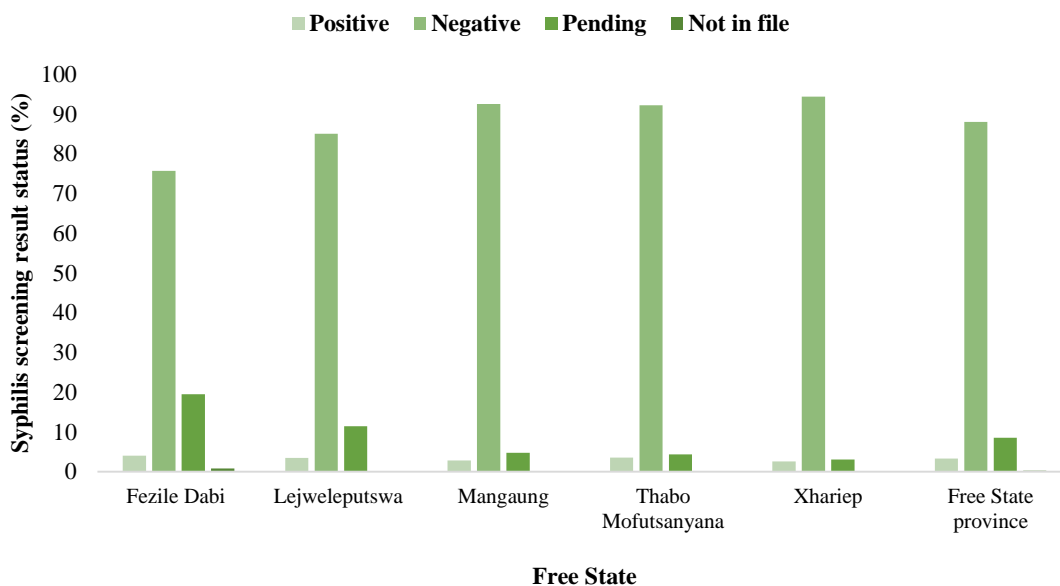
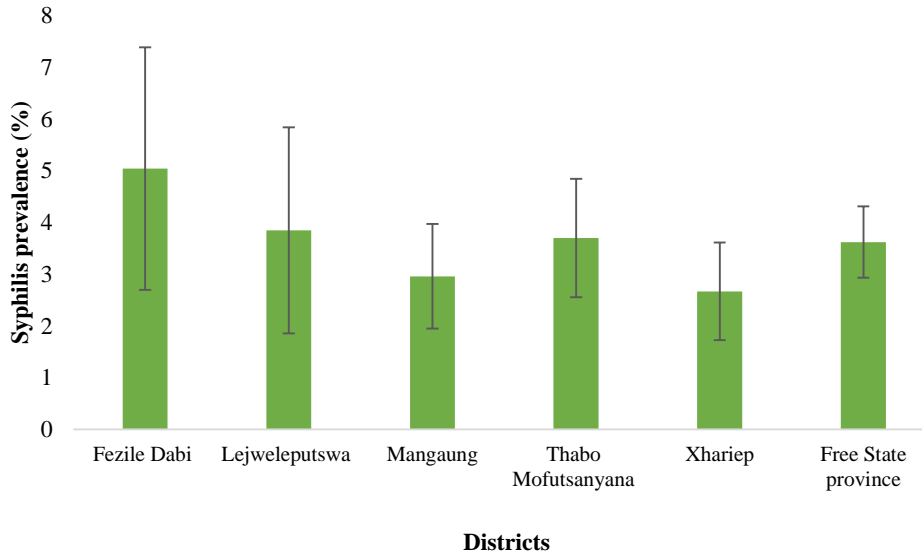


Figure 52: Maternal syphilis screening test result status by district, in the 2022 Antenatal HIV Sentinel Survey, Free State

Once the pending results and the results not in file were excluded, the prevalence of syphilis (per medical record review data) among those who had syphilis test result, was 3.6% (95% CI: 3.0 – 4.4) in Free State (Figure 25). In Fezile Dabi, the prevalence of syphilis was high at 5.0% (95% CI: 3.2 – 7.9) and the lowest was in Xhariep at 2.7% (95% CI: 1.9 – 3.8).



The denominator syphilis prevalence was the number of women who received syphilis test results. Missing data excluded
Figure 53: Maternal syphilis prevalence among antenatal women, in the 2022 HIV Antenatal Survey, Free State

Among those who were syphilis-positive and whose syphilis treatment status was reported, 100.0% (84) received treatment for syphilis. Of those treated for syphilis and had type of treatment data reported (84), 97.6% (82) were treated with at least one dose of BPG (Figure 26). If we assume that all missing responses mean that the subjects did not receive treatment for syphilis and include as such the missing data in the denominator, the coverage of syphilis treatment decreases from 100.0% to 94.4%.

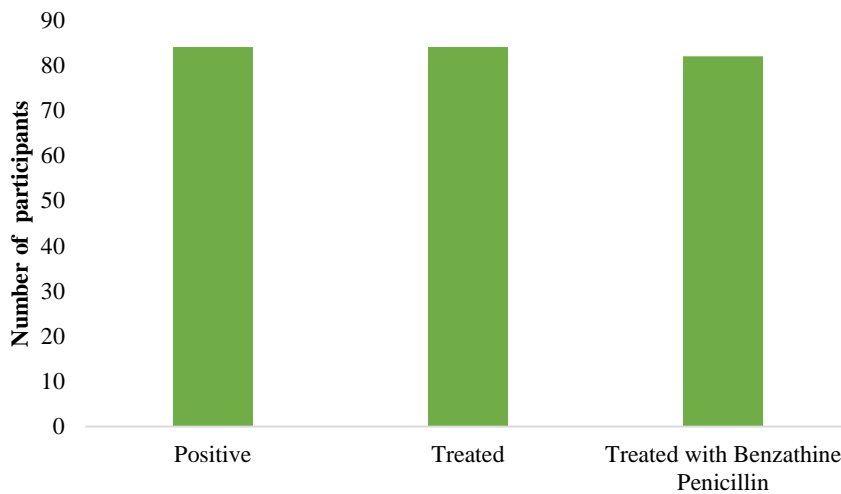


Figure 54: Syphilis treatment cascade among antenatal women, in the 2022 HIV Antenatal Survey, Free State

Gauteng

Sample size realization and demographic characteristics

The sample size realization in Gauteng was 117.0% (5 580). At district level, sample size realization ranged from 103.0% (1 182) in West Rand to 135% (1 524) in Ekurhuleni. The number of women enrolled was lowest in Sedibeng at 602 (10.8% of provincial total) and the highest in Ekurhuleni at 1 526 (27.3% of provincial total). The majority of participants were aged 25-29 years (28.4%), 20-24 years (24.5%) and 30-34 years (23.0%) (Figure 27).

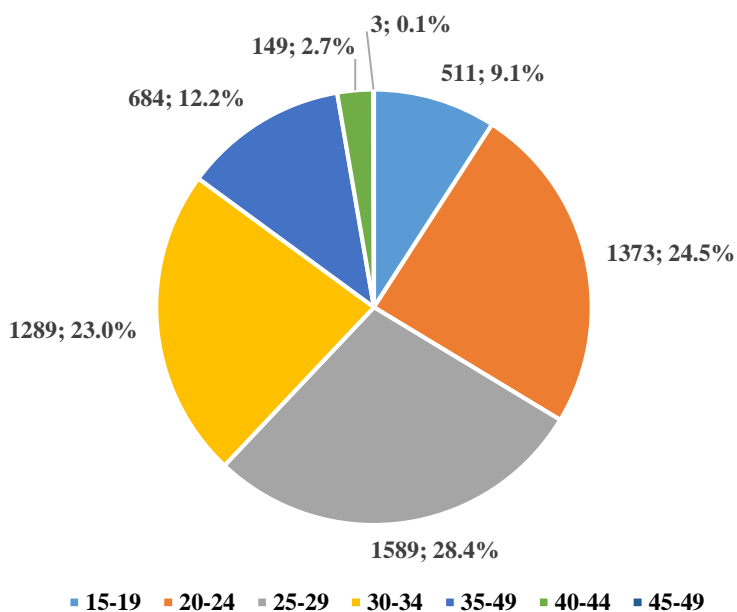
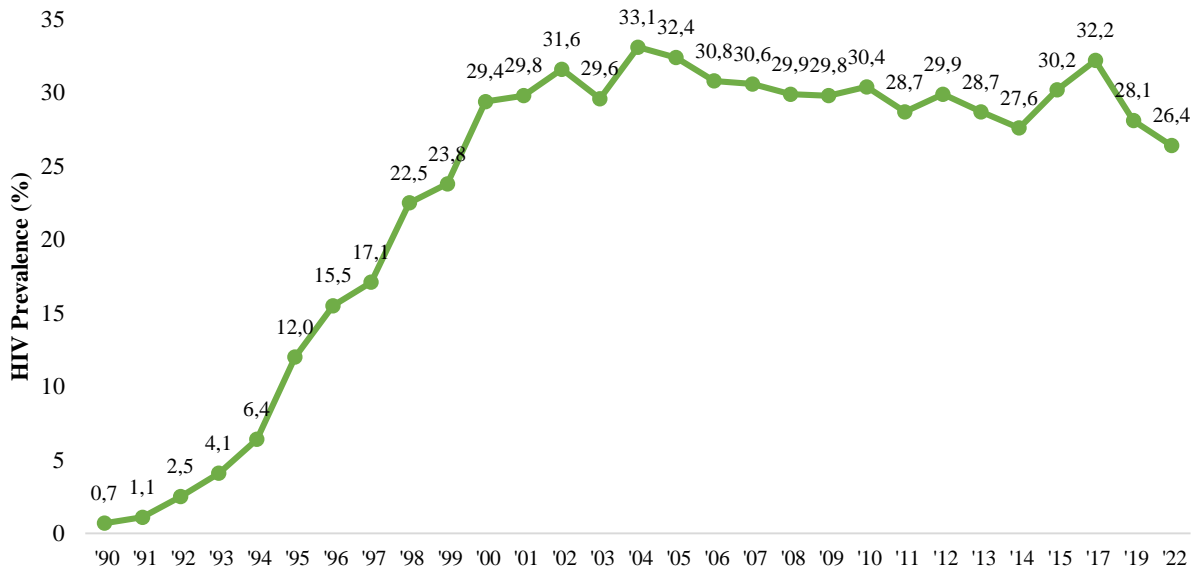


Figure 55: Distribution of survey participants by five-year age groups – Gauteng, Antenatal HIV Sentinel Survey, 2022

HIV prevalence

The HIV prevalence in Gauteng fluctuated between 30.4 % to 32.2% between 2010 and 2017 and had been declining ever since (Figure 28). In 2022, the HIV prevalence was 26.4% (95% CI: 25.4 – 27.6), which is lower by 1.7% points from the prevalence reported in 2019 (28.1%, 95% CI: 26.8 – 27.4).



The prevalence reported in 2015, 2017, and 2019 is for both first and follow-up visit attendees

Figure 56: The HIV epidemic curve among antenatal women, Gauteng, 1990 – 2022, Antenatal HIV Sentinel Survey

HIV prevalence by district

In Gauteng, Ekurhuleni Metropolitan Municipality (28.6%, 95% CI: 26.5 – 30.9) had the highest HIV prevalence followed by West Rand (28.5%, 95% CI: 26.1 – 31.0) (Figure 29). In this province, the district with the lowest HIV prevalence was Tshwane District Municipality at 22.6% (95% CI: 20.6 – 24.8). Overall, compared to the 2019 prevalence, the HIV prevalence decreased in City of Johannesburg, Sedibeng and Tshwane districts, remained the same in West Rand district and increased in Ekurhuleni district.

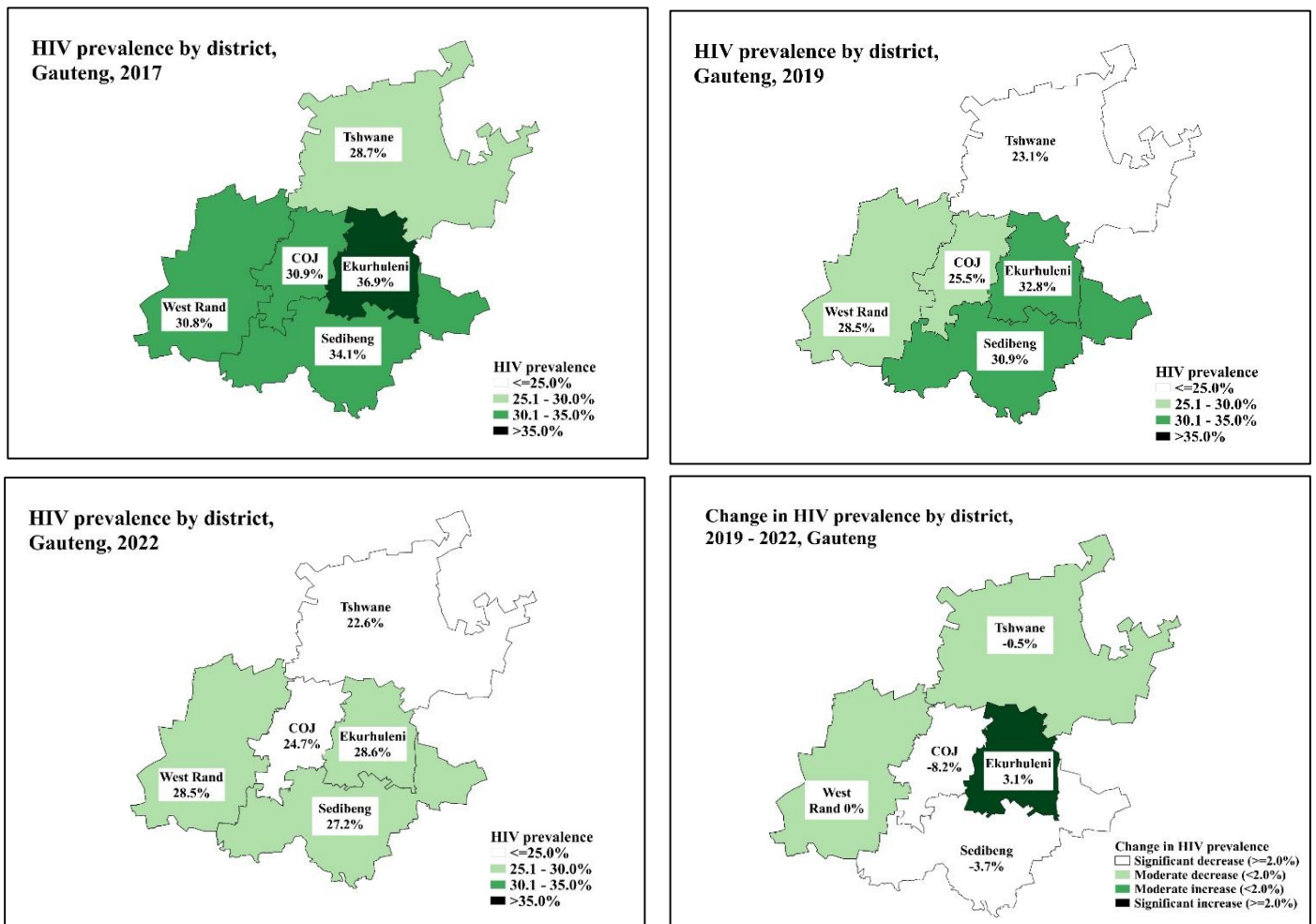
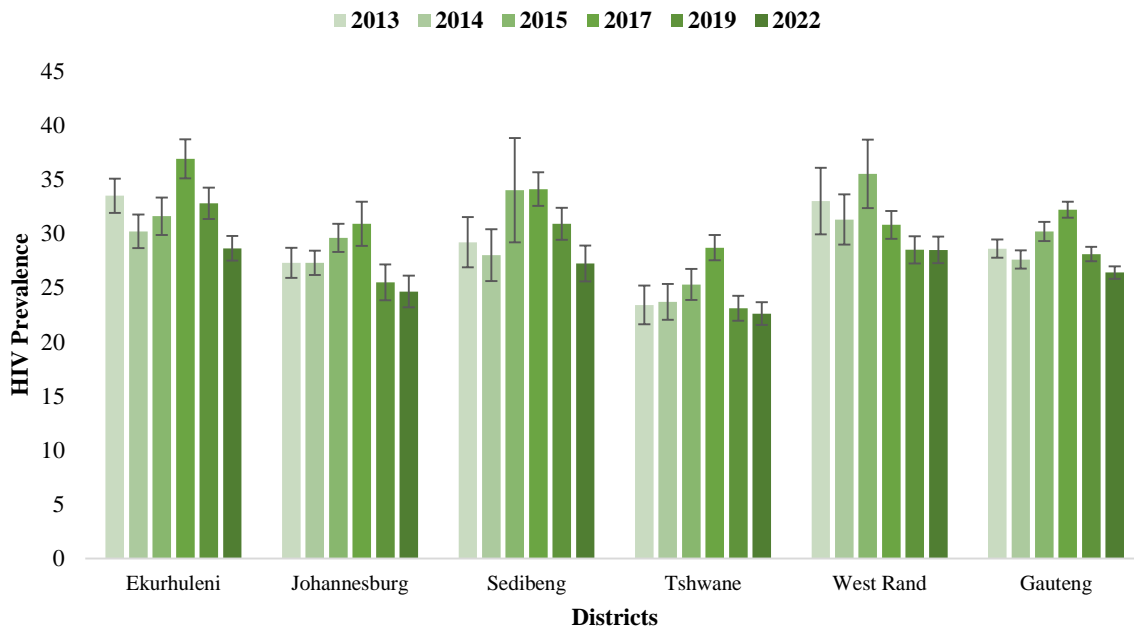


Figure 57: Change in district HIV prevalence estimates, 2017–2022, Antenatal HIV Sentinel Survey, Gauteng

Figure 30 and Table 3 show the prevalence trend for Gauteng from 2013 to 2022. District prevalence ranged from 22.6% in City of Tshwane to 28.6% in Ekurhuleni in 2022. Overall, the HIV prevalence has decreased from 2013 (28.6%) to 2022 (26.4%).



The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees. The confidence intervals are wide due to small sample size at district level

Figure 58: HIV prevalence trend by district, 2013–2022, Antenatal HIV Sentinel Survey, Gauteng

Table 3: HIV prevalence by district in the Gauteng province, Antenatal HIV Sentinel Survey, 2013 to 2022

District	2013		2014		2015		2017		2019		2022	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Ekurhuleni	33.5	30.4 - 36.6	30.2	27.3 - 33.4	31.6	28.3 - 35.1	36.9	33.4 - 40.5	32.8	30.0 - 35.7	28.6	26.5 - 30.9
Johannesburg	27.3	24.7 - 30.1	27.3	25.2 - 29.6	29.6	27.1 - 32.2	30.9	27.0 - 35.0	25.5	22.3 - 28.8	24.7	21.9 - 27.6
Sedibeng	29.2	24.8 - 33.9	28.0	23.5 - 32.9	34.0	25.2 - 44.1	34.1	31.1 - 37.2	30.9	28.1 - 33.9	27.2	24.1 - 30.6
Tshwane	23.4	20.1 - 27.1	23.7	20.6 - 27.1	25.3	22.6 - 28.2	28.7	26.5 - 31.1	23.1	21.0 - 25.5	22.6	20.6 - 24.8
West Rand	33.0	27.3 - 39.3	31.3	26.9 - 36.0	35.5	29.5 - 41.9	30.8	28.4 - 33.4	28.5	26.1 - 31.0	28.5	26.1 - 31.0
Gauteng	28.6	27.0 - 30.3	27.6	27.0 - 30.3	30.2	28.5 - 32.0	32.2	30.7 - 33.6	28.1	26.8 - 29.4	26.4	25.3 - 27.6

The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees

PMTCT cascade – the first and second 95

Based on medical records review, 99.96%⁶ (5 180) of women attending ANC were offered HIV testing or already knew their HIV positive status. Most of the ANC attendees offered the test, (99.98%, 5113) accepted the offered test or already knew their HIV-positive status. From the 1478 participants found to be HIV-positive by EIA test, 96.96% (1 433) already knew their HIV-positive status at the time of the survey (Figure 31). By district, Tshwane District had the lowest knowledge of HIV status (96.2 %) while West Rand had the highest knowledge of HIV status (97.9%).

Among those who knew their HIV-positive status, excluding 24 participants whose treatment status was not reported, 98.5% (1 408) initiated ART at the time of the survey. At a district level, of those who knew their status, ART initiation ranged from 90.0% (Tshwane) to 99.4% (Sedibeng). Initiation of ART increased between 2019 and 2022 in all districts.

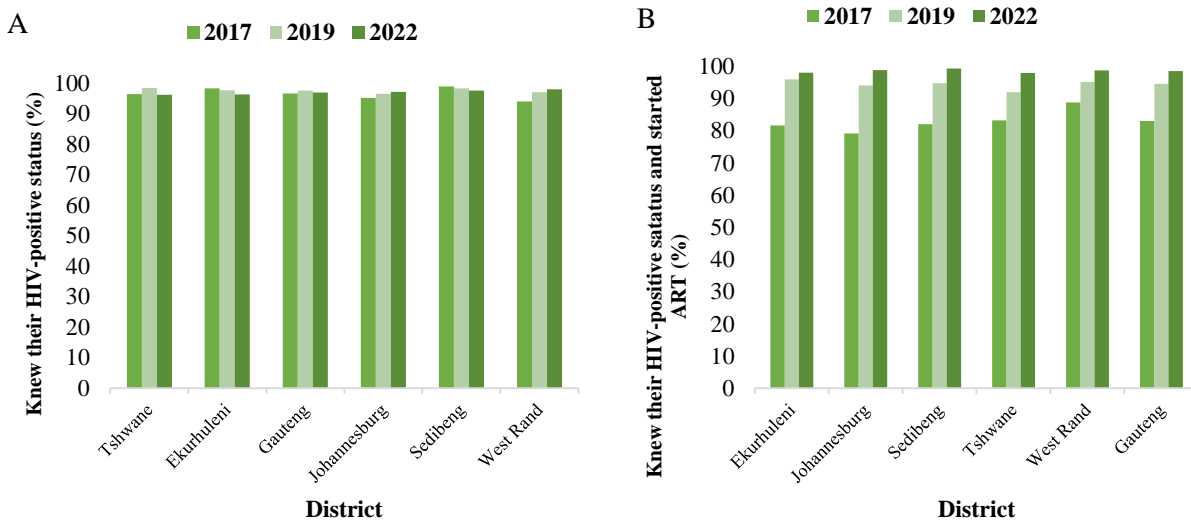


Figure 59: Knowledge of HIV-positive status and ART initiation at the time of the survey by district, in the 2017, 2019 and 2022 Antenatal HIV Sentinel Surveys, Gauteng

Knowledge of HIV-positive status and ART initiation before pregnancy

In Gauteng, knowledge of HIV status before pregnancy was 74.6%, which was slightly below the national average (78.1%). Among those who knew their HIV-positive status prior to pregnancy and had a reported treatment status (962), 803 (83.5%) started ART before pregnancy (Figure 32).

At district level, knowledge of HIV status before pregnancy ranged from 72.8 % (Tshwane) to 77.2% (Sedibeng) in 2022. The Ekurhuleni district had the lowest ART initiation before pregnancy (78.1%) and the highest ART initiation before pregnancy was in Sedibeng (88.8%). In all districts the percentage of women who knew their HIV positive status and initiated ART prior to pregnancy decreased compared to 2019.

⁶416 (7.3%) missing response excluded when calculating percentage

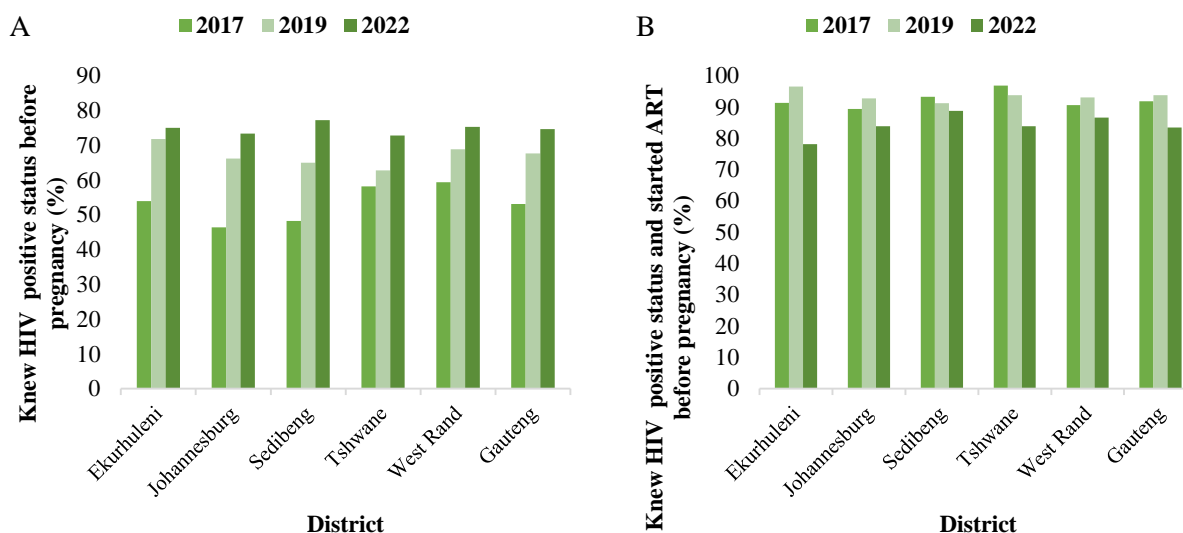


Figure 60: Knowledge of HIV-positive status and ART initiation before pregnancy by district, in the 2017, 2019 and 2022 Antenatal HIV Sentinel Survey, Gauteng

Viral Load Monitoring

In Gauteng, viral load testing coverage was 87.3% (879 out of 1 007) and it was greater than 85.0% across all districts in the province (Figure 33). Among those who had a viral load test done and were due for a viral load test, 76.0% (668/879) had received their viral load results. Of those who had a viral load test done and received results, viral suppression (<50 copies/ml) was at 72.6% (485/668).

At a district level, Tshwane had the lowest viral load testing coverage (85.3%, 95% CI: 79.1 – 89.9) and the highest viral load testing coverage was in Sedibeng (87.7%, 95% CI: 83.9 – 90.7). In West Rand only 71.2% (95% CI: 61.8 – 79.0) had received viral load test results while in Sedibeng 87.0% (95% CI: 74.0 – 86.9) had received results. Viral load suppression was the lowest in Tshwane at 64.6% (95% CI: 57.9 – 70.8) and was the highest in Sedibeng at 80.5% (95% CI: 75.0 – 85.0).

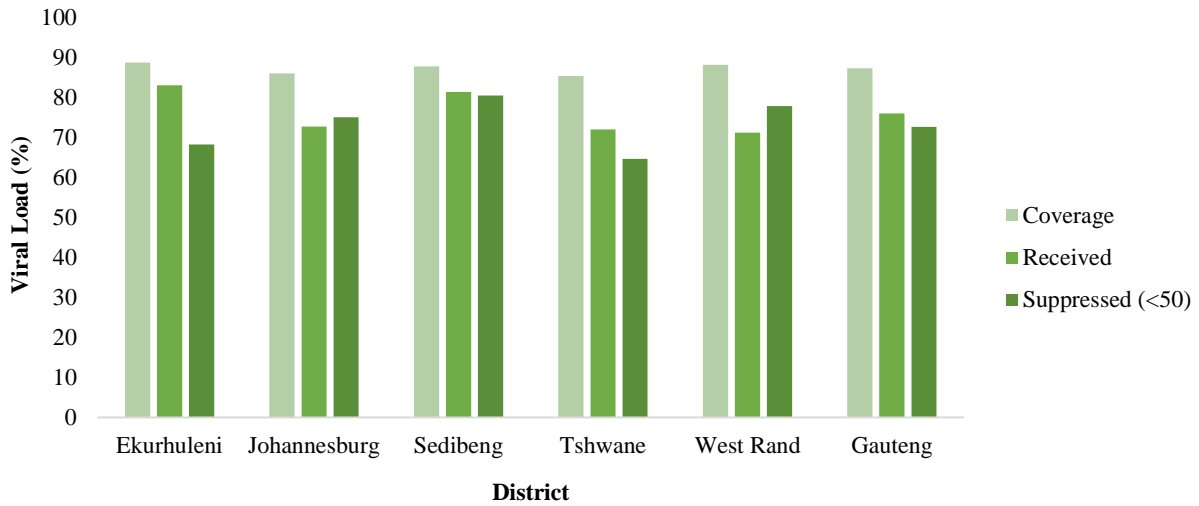


Figure 61: Viral load testing among antenatal women by district, in the 2022 HIV Antenatal Survey, Gauteng

PrEP Coverage

In Gauteng, 42.1% (1 408 out of 3 341) of HIV negative women were PrEP eligible. Of those who were PrEP eligible and whose prior use of PrEP use was reported, prior use of PrEP was 4.0% (95% CI: 3.2 – 5.1) (Figure 34). Prior use of PrEP was the lowest in Johannesburg (1.1%, 95% CI: 0.4 – 3.5) and the highest in Sedibeng (4.6%, 95% CI: 2.7 – 7.9). Among PrEP eligible women whose current use of PrEP was reported, 4.2% (95% CI: 3.0 – 5.9) were currently taking PrEP. Tshwane district had the lowest current use of PrEP pregnancy (0.7%, 95% CI: 0.3 – 1.8).

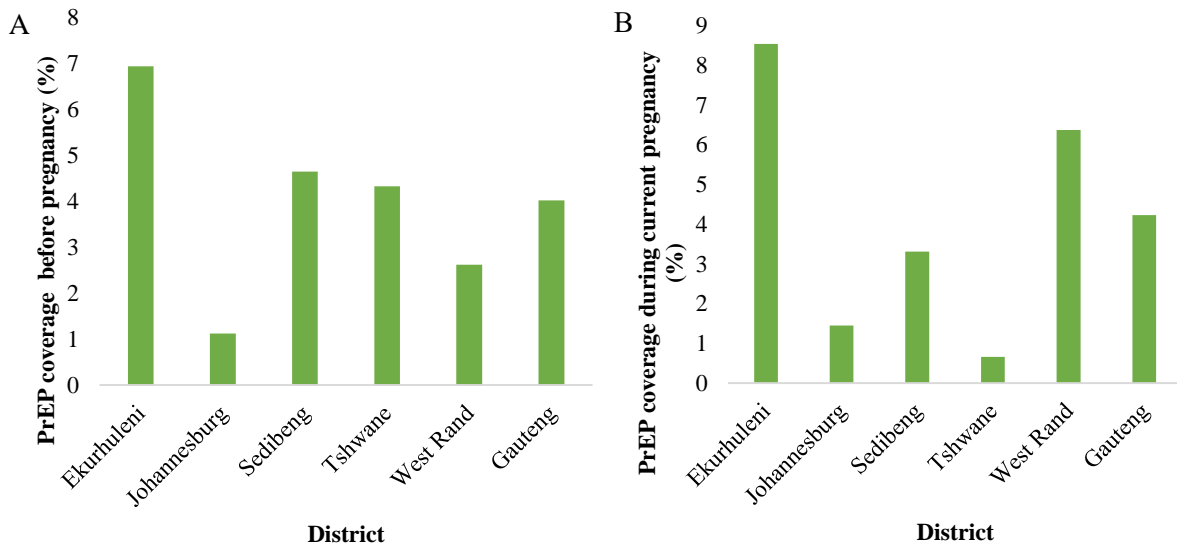


Figure 62: PrEP coverage before pregnancy (A) and during current pregnancy (B) by district, in the 2022 Antenatal HIV Sentinel Survey, Gauteng

Early ANC attendance

In Gauteng, 21.2% of the participants attended their first-ANC-visit before or at 12 weeks of pregnancy (Figure 35), while more than half (56.6%) of the participants in the province attended their first-ANC-visit before 20 weeks of gestational age. At a district level, the lowest attendance of ANC before 20 weeks was in Johannesburg (53.1%) and the highest was in West Rand (64.8%). Attendance of ANC before 20 weeks was lower than the national average (61.0%) among women with high (≥ 4) gravidity (48.4%), single women (52.1%), participants with no education (35.9%) or primary education (49.9%), adolescent girls (50.6%) and women older than 40 years (51.4%).

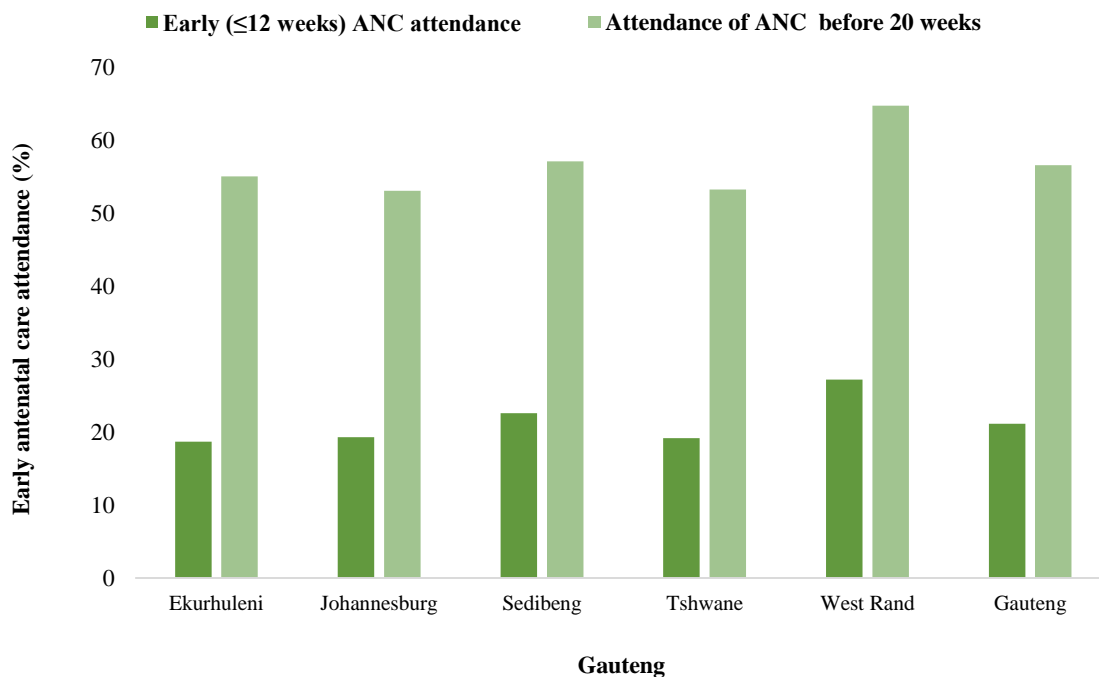
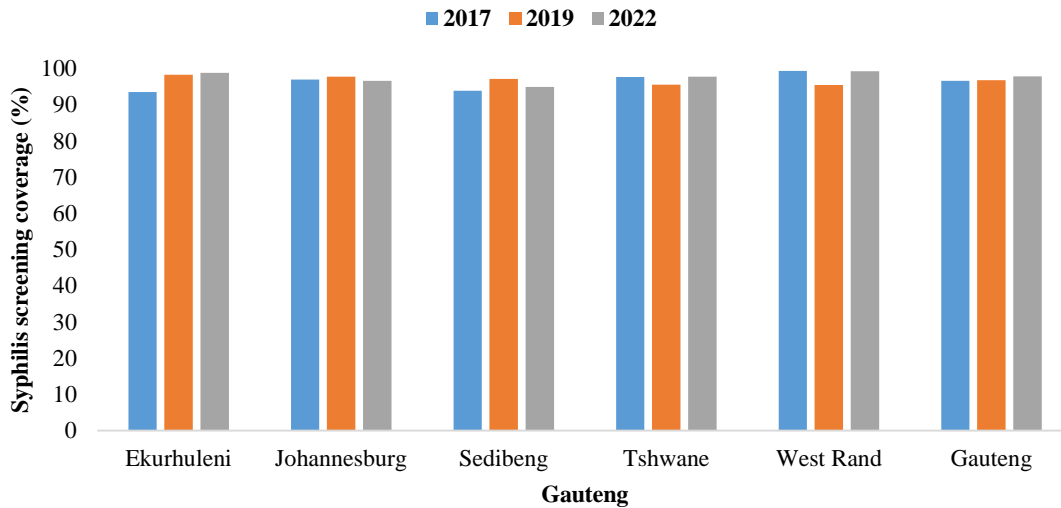


Figure 63: Early attendance of antenatal care by province in the 2022 Antenatal HIV Sentinel Survey, Gauteng

Maternal syphilis screening and treatment coverage

In Gauteng, maternal syphilis screening coverage was 97.8%, which was an increase from 96.8% in 2019 (Figure 36). All districts in Gauteng had syphilis screening coverage greater than 94.0% with the lowest being 95.0% (Sedibeng).

With regards to missing data for syphilis screening coverage, 2.4% (133) of the participants had missing data. If we assume that all missing responses indicate the participant did not receive the screening test, and include them as such in the denominator, coverage for syphilis screening in Gauteng decreased from 97.8% to 95.5%.



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

Figure 64: Maternal syphilis screening coverage among antenatal women, in the 2017, 2019, 2022 Antenatal HIV Survey, Gauteng

Of the women who had syphilis screening, 1.4% (72) were positive, 66.8% (3 394) were negative, 30.6% (1 554) had pending results, 1.1% (58) did not have results in file (Figure 37). Of those who had a test, combined 31.7% had missing results (either due to pending in the laboratory or due to not being in patient file). The lowest percent of missing results was in West Rand (6.2%) and the highest was in Tshwane (48.6%).

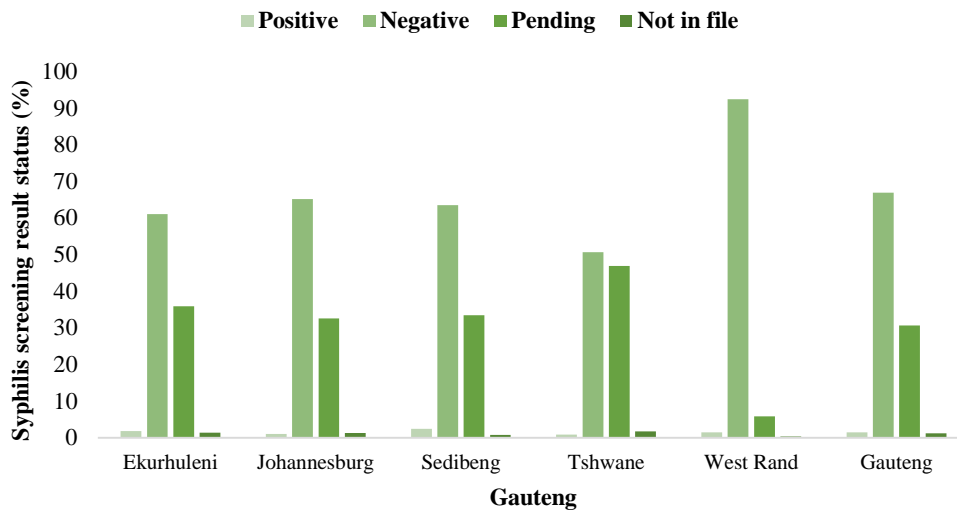
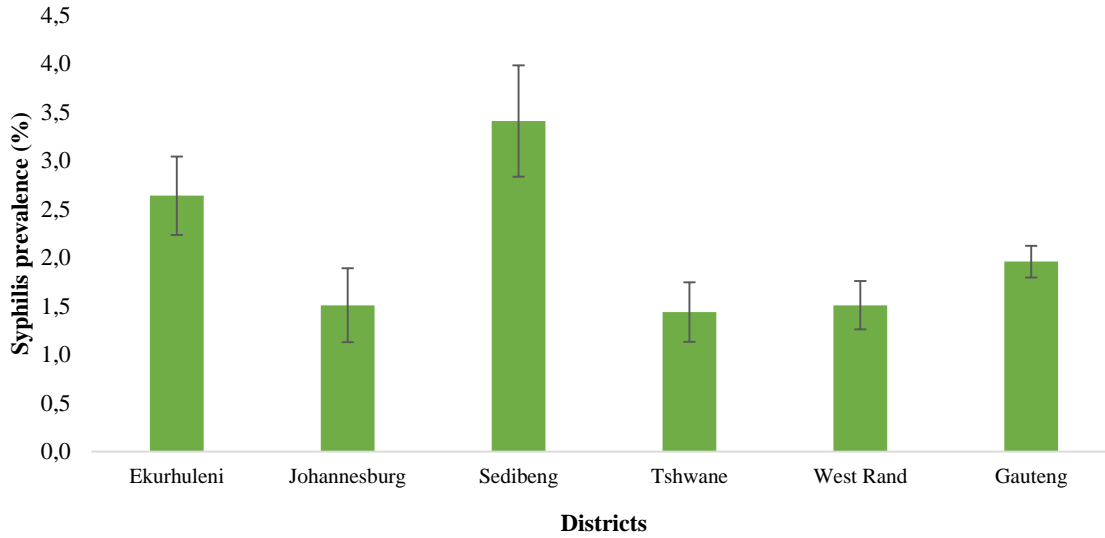


Figure 65: Maternal syphilis screening test result status by district, in the 2022 Antenatal HIV Sentinel Survey, Gauteng

Once the pending results and the results not in file were excluded, the prevalence of syphilis (per medical record review data) among those who had syphilis test result, was 2.0% (95% CI: 1.7 – 2.3) overall (Figure 38). In Sedibeng, the prevalence of syphilis was high at 3.41% (95% CI: 2.4 – 4.7) and the lowest was in Tshwane at 1.4% (95% CI: 0.9 – 2.2).



The denominator syphilis prevalence was the number of women who received syphilis test results. Missing data excluded
Figure 66: Maternal syphilis prevalence among antenatal women, in the 2022 HIV Antenatal Survey, Gauteng

Among those who were syphilis-positive and whose syphilis treatment status was reported, 98.6% (68) received treatment for syphilis. Of those treated for syphilis and had type of treatment data reported (68), 75.0% (51) were treated with at least one dose of BPG (Figure 39). If we assume that all missing responses mean that the subjects did not receive treatment for syphilis and include as such the missing data in the denominator, the coverage of syphilis treatment decreases from 98.6% to 94.4%.

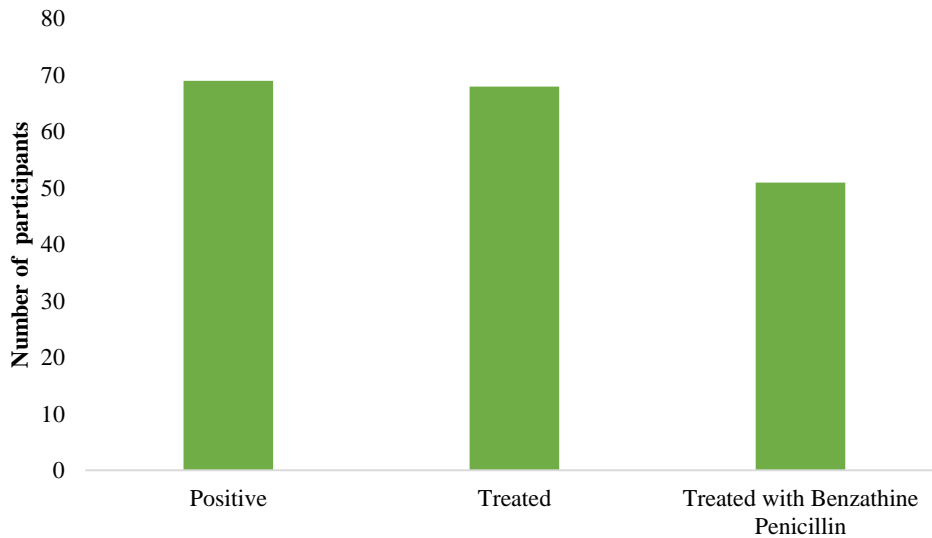


Figure 67: Syphilis treatment cascade among antenatal women, in the 2022 HIV Antenatal Survey, Gauteng

KwaZulu Natal

Sample size realization and demographic characteristics

The sample size realization in KwaZulu Natal was 105.2% (9 201). At district level, the total number of women enrolled ranged from 634 in Zululand to 1 008 in Harry Gwala District. Sample realization ranged from 86.1% in Zululand to 188.0% in Harry Gwala. The majority of participants were aged 20-24 years (27.0%), 25-29 years (25.6%) and 30-34 years (18.5%) (Figure 40).

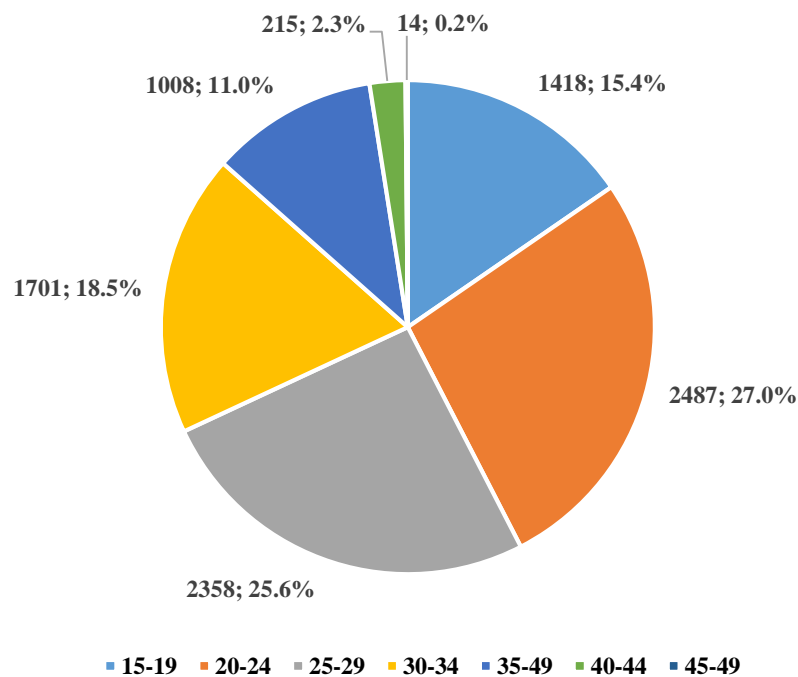
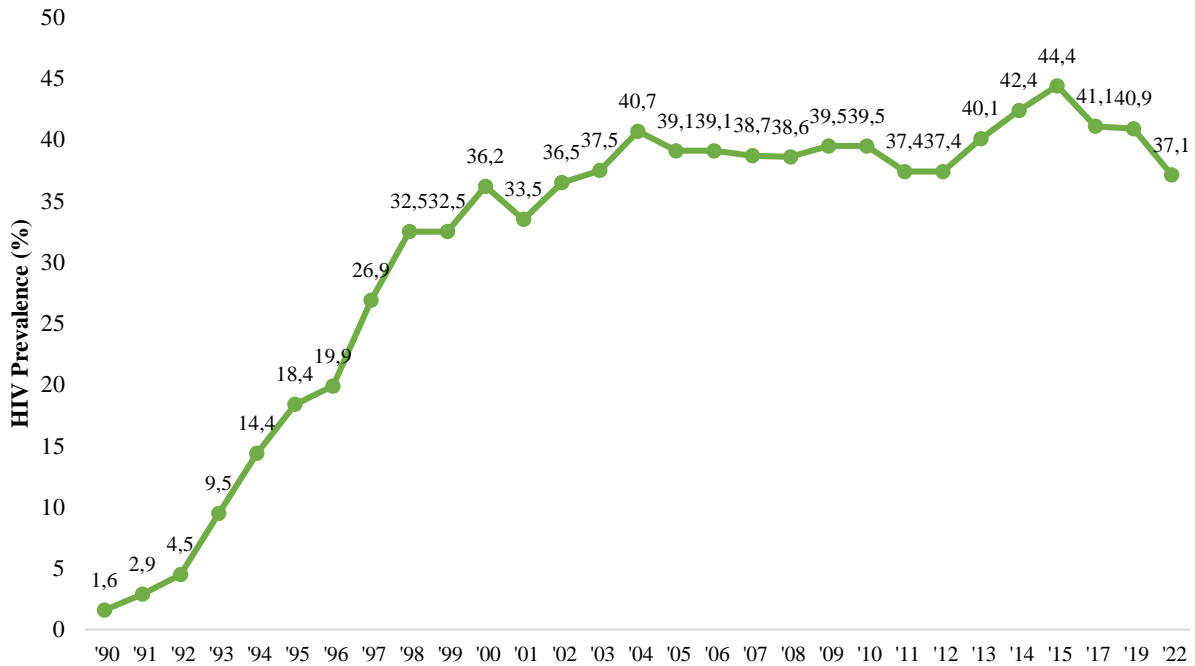


Figure 68: Distribution of survey participants by five-year age groups – KwaZulu Natal, Antenatal HIV Sentinel Survey, 2022

HIV prevalence

The HIV prevalence in KwaZulu Natal fluctuated between 39.5% to 44.4% between 2010 and 2015 and has been declining ever since (Figure 41). In 2022, the HIV prevalence was 37.1% (95% CI: 35.8 – 38.5), which is 3.8% points lower than the prevalence reported in 2019 (40.9%, 95% CI: 39.6- 42.2).



The prevalence reported in 2015, 2017, 2019, and 2022 is for both first and follow-up visit attendees

Figure 69: The HIV epidemic curve among antenatal women, KwaZulu Natal, 1990 – 2022, Antenatal HIV Sentinel Survey

HIV prevalence by district

In KwaZulu Natal, UMkhanyakude District (44.0%, 95% CI: 37.6 – 50.7) had the highest HIV prevalence followed by uMgungundlovu (41.8%, 95% CI: 36.0 – 47.9) (Figure 42). In this province, the district with the lowest HIV prevalence was UMzinyathi District at 31.0% (95% CI: 27.3 – 35.0). Overall, compared to the 2019 prevalence, the HIV prevalence decreased in all districts except in Harry Gwala, Ugu and uMgungundlovu districts while it remained the same in UMkhanyakude.

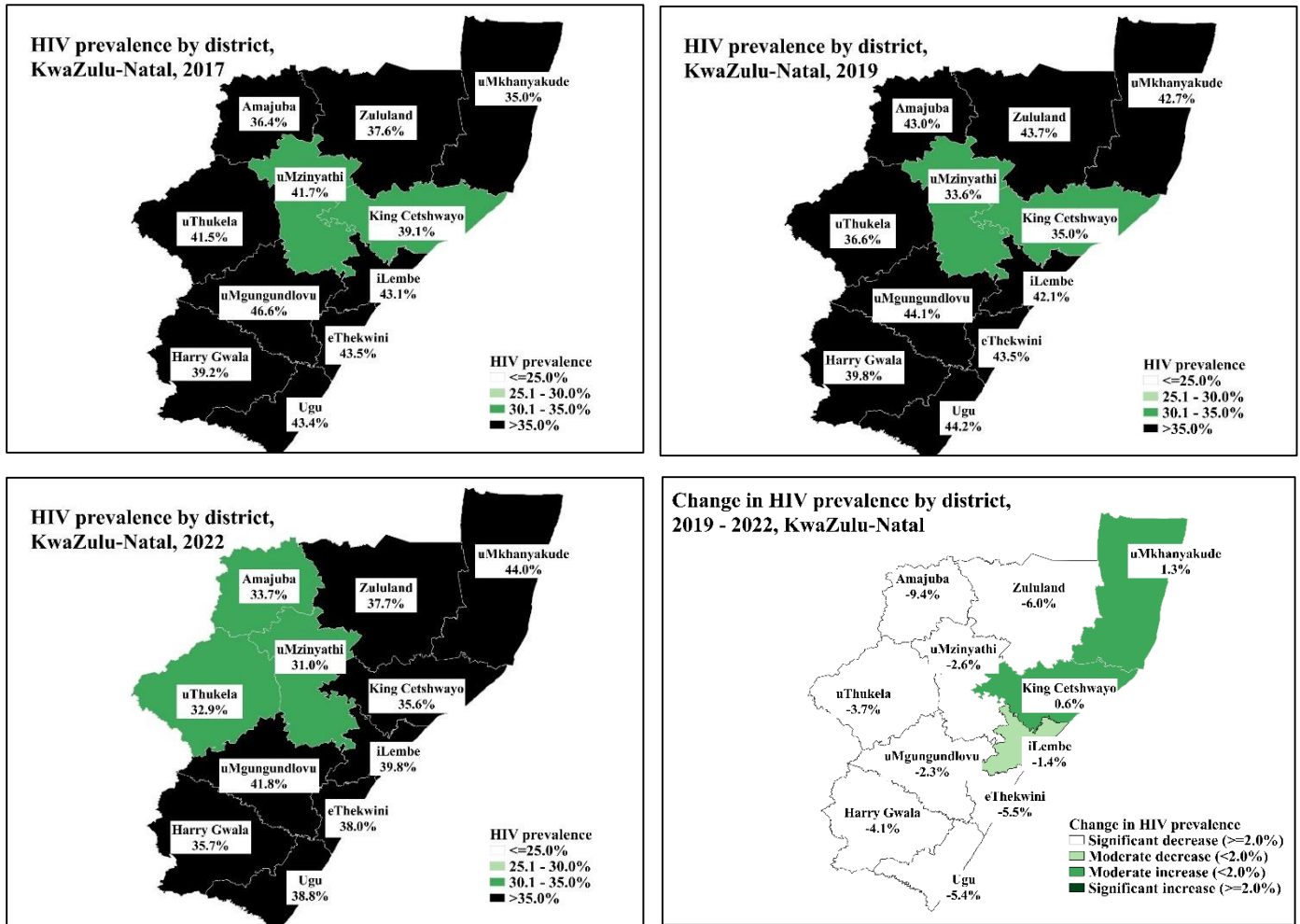
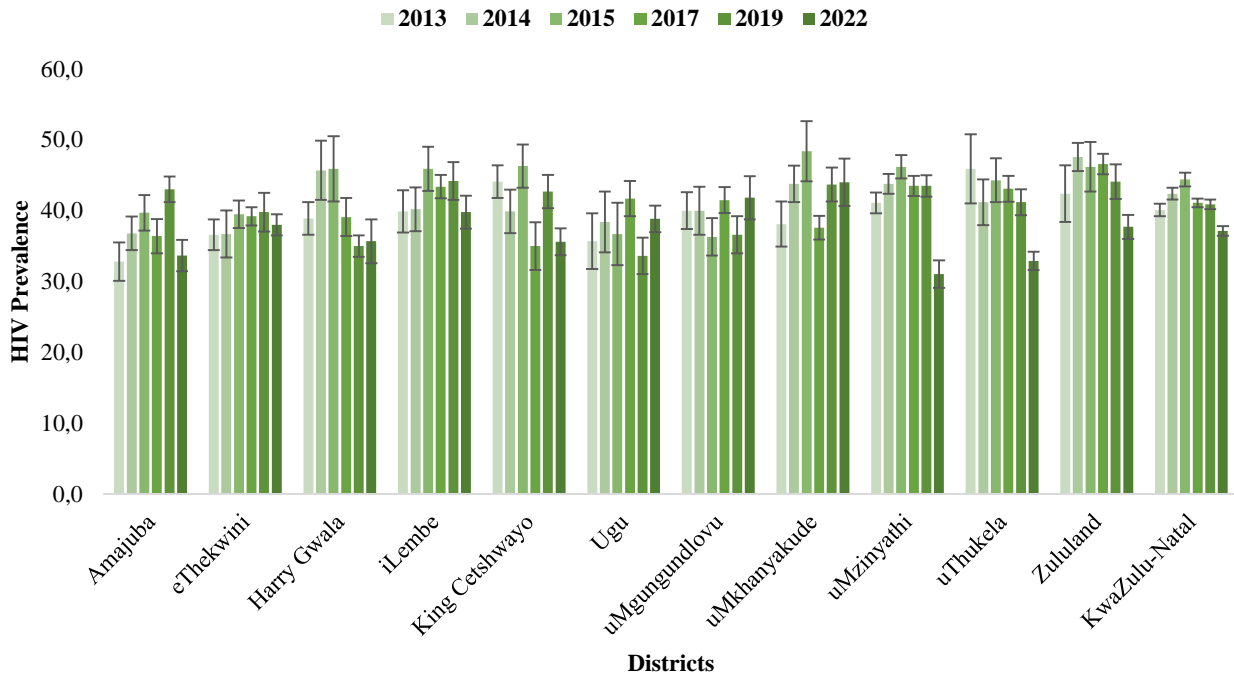


Figure 70: Change in district HIV prevalence estimates, 2017–2022, Antenatal HIV Sentinel Survey, KwaZulu-Natal

Figure 43 and Table 4 show the prevalence trend for KwaZulu Natal from 2013 to 2022. The district HIV prevalence in the province ranged from 31.0% in uMzinyathi to 44.0% in uMkhanyakude in 2022.



The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees. The confidence intervals are wide due to small sample size at district level

Figure 71: HIV prevalence trend by district, 2013–2022, Antenatal HIV Sentinel Survey, KwaZulu Natal

Table 4: HIV prevalence by district in the KwaZulu-Natal province, Antenatal HIV Sentinel Survey, 2013 to 2022

District	2013		2014		2015		2017		2019		2022	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Amajuba	32.8	27.7 - 38.3	36.8	32.3 - 41.6	39.7	34.9 - 44.8	36.4	31.7 - 41.2	43.0	39.5 - 46.6	33.7	29.4 - 38.1
eThekwini	41.1	38.3 - 44.0	43.8	41.1 - 46.6	46.2	43.0 - 49.5	43.5	40.7 - 46.3	43.5	40.5 - 46.4	38.0	35.1 - 41.0
Harry Gwala	36.6	32.5 - 41.0	36.7	30.4 - 43.4	39.5	35.8 - 43.4	39.2	36.7 - 41.7	39.8	34.6 - 45.3	35.7	29.9 - 42.0
iLembe	45.9	36.5 - 55.6	41.2	35.0 - 47.7	44.3	38.3 - 50.5	43.1	39.5 - 46.7	41.2	37.7 - 44.9	39.8	35.3 - 44.5
King Cetshwayo	38.9	34.4 - 43.5	45.7	37.6 - 54.0	45.9	37.0 - 55.1	39.1	34.0 - 44.5	35.0	32.1 - 38.1	35.6	32.0 - 39.4
Ugu	39.9	34.2 - 45.9	40.2	34.4 - 46.4	45.9	39.9 - 52.1	43.4	40.2 - 46.7	44.2	39.0 - 49.5	38.8	35.2 - 42.6
uMgungundlovu	42.4	34.8 - 50.5	47.6	43.7 - 51.5	46.2	39.3 - 53.1	46.6	43.8 - 49.5	44.1	39.3 - 48.9	41.8	36.0 - 47.9
uMkhanyakude	44.1	39.6 - 48.6	39.9	34.0 - 46.1	46.3	40.4 - 52.3	35.0	28.7 - 41.9	42.7	38.2 - 47.4	44.0	37.6 - 50.7
uMzinyathi	35.7	28.4 - 43.8	38.4	30.3 - 47.1	36.7	28.5 - 45.8	41.7	36.9 - 46.6	33.6	28.8 - 38.9	31.0	27.3 - 35.0
uThukela	40.0	35.0 - 45.2	40.0	33.5 - 46.8	36.3	31.3 - 41.7	41.5	38.0 - 45.1	36.6	31.6 - 41.9	32.9	30.4 - 35.5
Zululand	38.1	32.1 - 44.6	43.8	38.8 - 48.9	48.4	40.2 - 56.8	37.6	34.4 - 41.0	43.7	39.1 - 48.5	37.7	34.5 - 41.1
KwaZulu-Natal	40.1	38.4 - 41.8	42.4	40.8 - 44.1	44.4	42.5 - 46.3	41.1	39.9 - 42.3	40.9	39.6 - 42.3	37.1	35.8 - 38.5

The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees

PMTCT cascade – the first and second 95

Based on medical records review, 99.9%⁷ (8 774) of women attending ANC were offered HIV testing or already knew their HIV positive status. Most of the ANC attendees offered the test, accepted (99.99%, 8 606) the offered test or already knew their HIV-positive status. From the 3417 participants found to be HIV-positive by EIA test, 97.0% (3 314) already knew their HIV-positive status at the time of the survey (Figure 44). By district, King Cetshwayo had the lowest knowledge of HIV status (94.0%) while eThekweni Metropolitan District had the highest knowledge of HIV status (99.1%).

Among those who knew their HIV-positive status, excluding 27 participants whose treatment status was not reported, 99.3% (3 287) had initiated ART at the time of the survey. At a district level, of those who knew their status, ART initiation ranged from 98.4% (Amajuba) to 100.0% (Harry Gwala, uMzinyathi and uThukela). Initiation of ART increased between 2019 and 2022 in all districts.

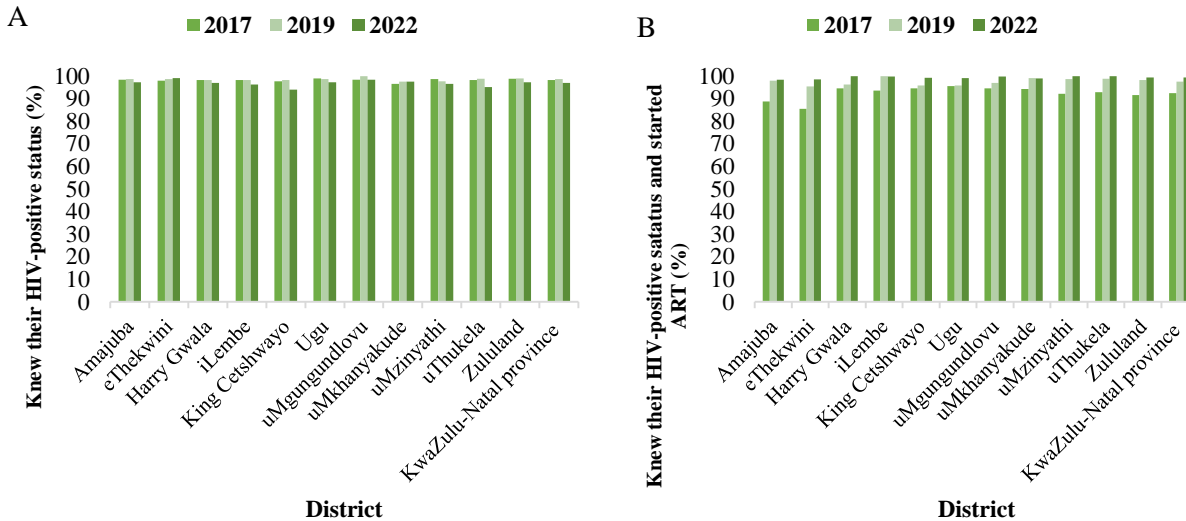


Figure 72: Knowledge of HIV-positive status and ART initiation by district, in the 2017, 2019 and 2022 Antenatal HIV Sentinel Surveys, KwaZulu Natal

Knowledge of HIV-positive status and ART initiation before pregnancy

In KwaZulu Natal, knowledge of HIV status before pregnancy was 99.3%, which was much higher than the national average (78.1%). Among those who knew their HIV-positive status prior to pregnancy and had a reported treatment status (2 482), 2 105 (84.8%) started ART before pregnancy (Figure 45).

At district level, knowledge of HIV status before pregnancy ranged from 98.4% (Amajuba) to 100.0% (Harry Gwala, uMzinyathi and uThukela) in 2022. The Zululand district had the lowest ART initiation before pregnancy (74.0%) and the highest ART initiation before pregnancy was in Amajuba (91.8%). In all districts except Amajuba (where it increased slightly), the percentage

⁷419 (4.5%) missing response excluded when calculating percentage

of women who knew their HIV-positive status and initiated ART prior to pregnancy decreased compared to 2019.

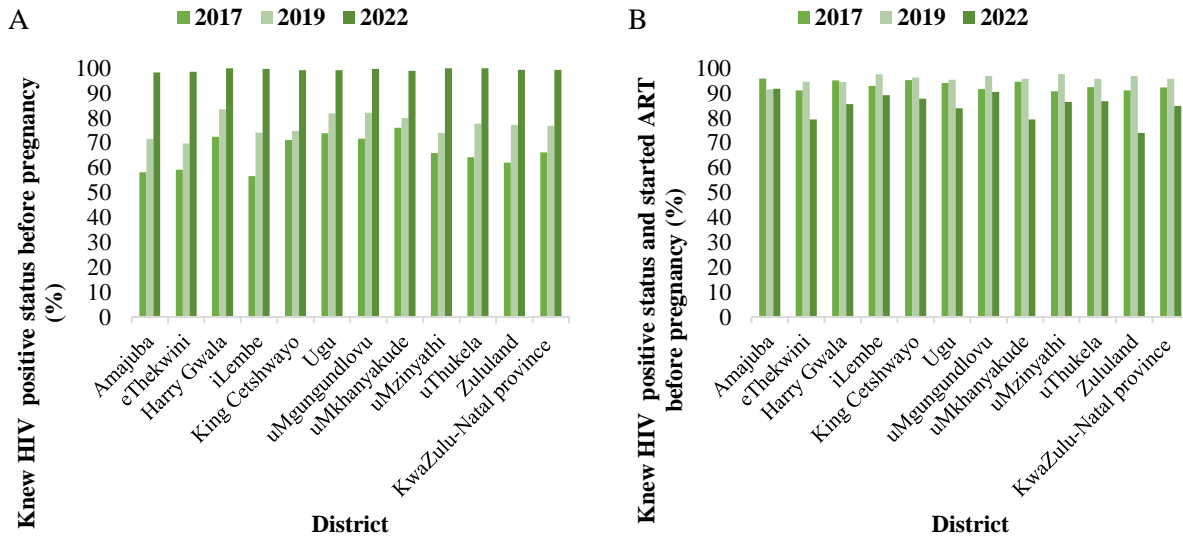


Figure 73: Knowledge of HIV-positive status and ART initiation before pregnancy by district, in the 2017, 2019 and 2022 Antenatal HIV Sentinel Survey, KwaZulu Natal

Viral Load Monitoring

In KwaZulu Natal, viral load testing coverage was 90.5% (2 271 out of 2 510) and was greater than 83.0% across all districts in the province (Figure 46). Among those who had a viral load test done and were due for a viral load test, 85.2% (1 935/2 271) had received their viral load results. Of those who had a viral load test done and received results, viral suppression (<50 copies/ml) was at 81.3% (1 574/1 935).

At a district level, Amajuba had the lowest viral load testing coverage (86.0%, 95% CI: 78.8 – 91.0) and highest viral load testing coverage was in uMzinyathi (93.8%, 95% CI: 89.3 – 96.0). In King Cetshwayo, only 75.6% (95% CI: 64.6 – 84.0) had received viral load test results while in uMzinyathi 92.9% (95% CI: 88.5 – 95.0) had received results. Viral load suppression was the lowest in eThekweni at 74.2% (95% CI: 70.4 – 77.7) and the highest was at 88.2% (95% CI: 83.3 – 91.9) in Ugu.

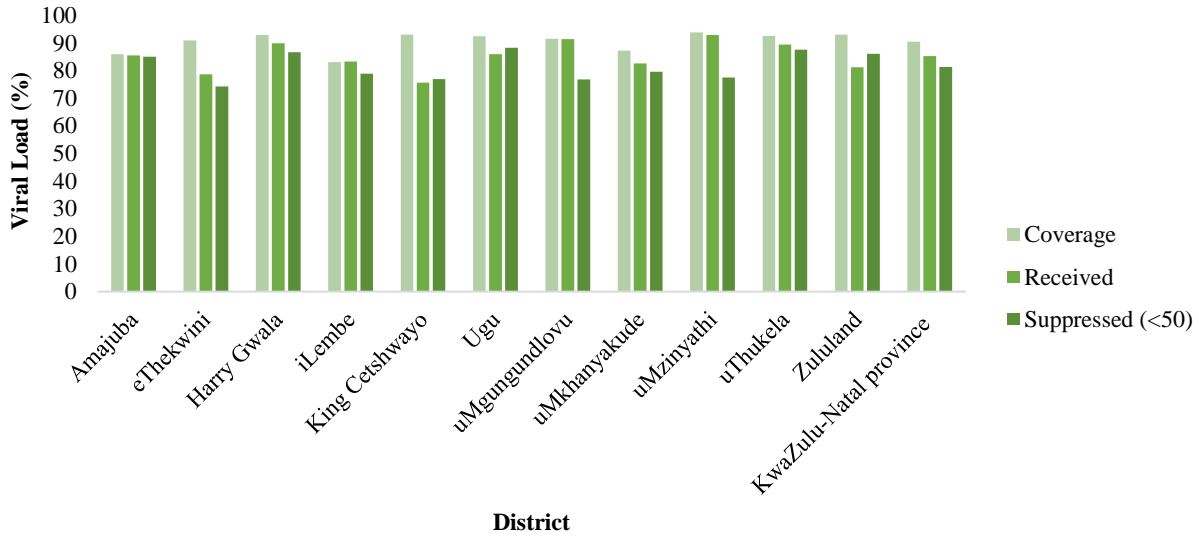


Figure 74: Viral load testing among antenatal women by district, in the 2022 HIV Antenatal Survey, KwaZulu Natal

PrEP Coverage

In KwaZulu Natal, 47.1% (2 249 out of 4 778) of HIV negative women were PrEP eligible. This proportion of PrEP eligibility among HIV negative women was the highest among all the provinces. Of those who were PrEP eligible and whose prior use of PrEP use was reported, prior use of PrEP was 6.2% (95% CI: 5.3 – 7.3) (Figure 47). Prior use of PrEP was the lowest in iLemba district at 1.7%, 95% CI: 0.6- 4.2) and the highest in Zululand (19.7%, 95% CI: 12.0 – 30.5). Among PrEP eligible women whose current use of PrEP was reported, 17.9% (95% CI: 15.0 – 21.1) were currently taking PrEP. Amajuba District had the lowest current use of PrEP pregnancy (3.6%, 95% CI: 2.3 – 5.7).

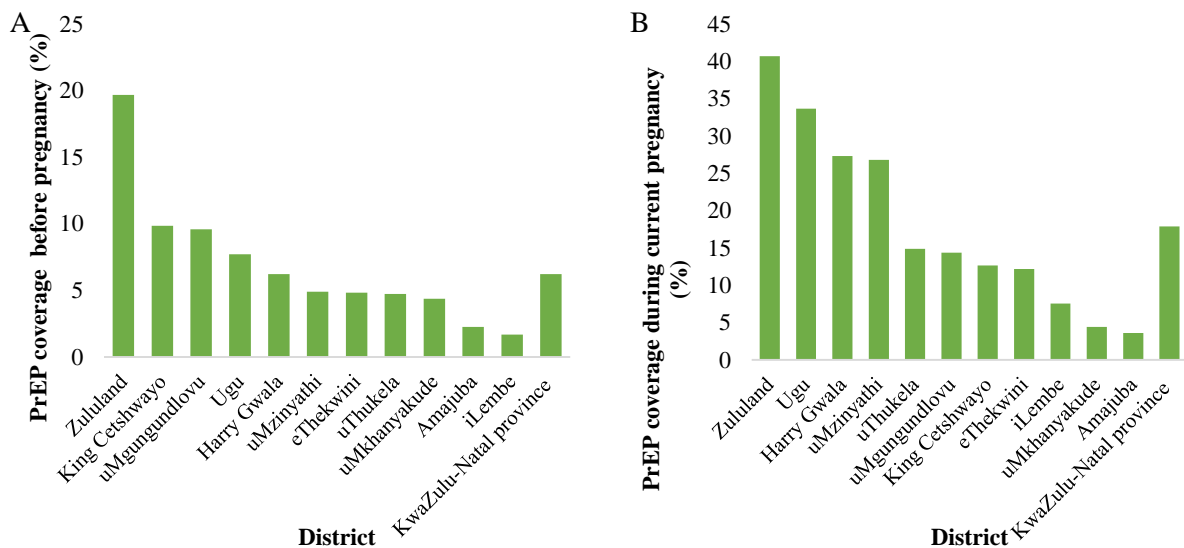


Figure 75: PrEP coverage before pregnancy (A) and during current pregnancy (B) by district, in the 2022 Antenatal HIV Sentinel Survey, KwaZulu Natal

Early ANC attendance

In KwaZulu Natal, 26.6% of the participants attended their first-ANC-visit before or at 12 weeks of pregnancy (Figure 48), while 64.5 % attended their first-ANC-visit before 20 weeks of gestational age. At a district level, the lowest attendance of ANC before 20 weeks was in King Cetshwayo (59.0%) and the highest was in Harry Gwala (69.1%). Attendance of ANC before 20 weeks was higher than the national average (61.0%) overall and but lower than the national average among women with high (≥ 4) gravidity (59.6%), single women (52.5%) and adolescent girls (60.0%). ANC attendance among participants with primary education (61.1%) or no education (66.3%) or women older than 40 years (63.3%) was higher or similar to the national average.

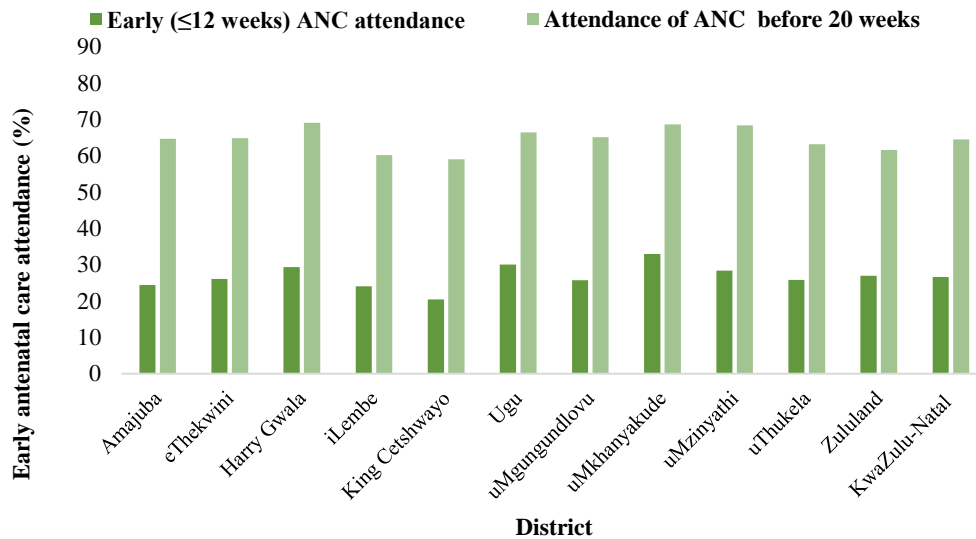
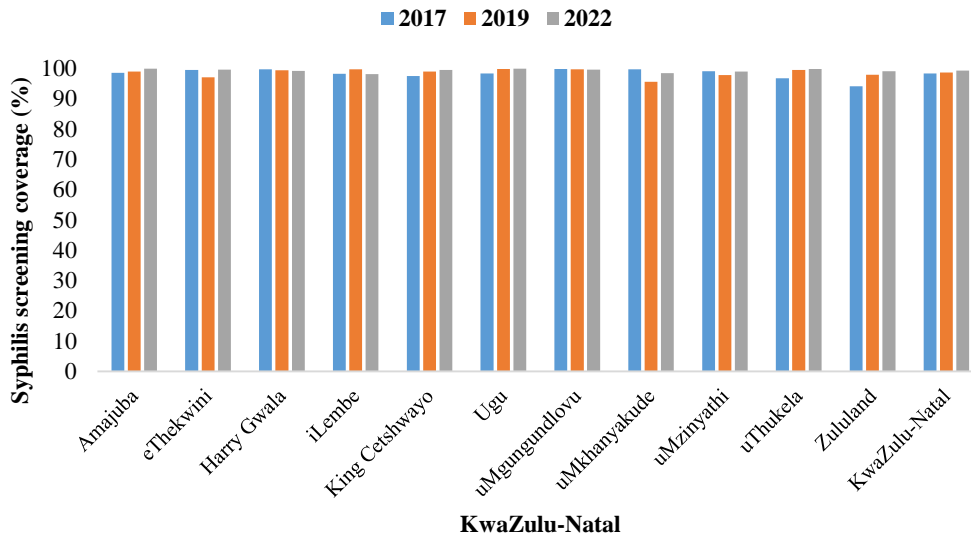


Figure 76: Early attendance of antenatal care by province in the 2022 Antenatal HIV Sentinel Survey, KwaZulu Natal

Maternal syphilis screening and treatment coverage

For KwaZulu Natal, maternal syphilis screening coverage was 99.4%, which was an increase from 2019 (98.7%) (Figure 49). All districts in the province had syphilis screening coverage greater than 98.0% with the lowest being 94.2% (iLembe).

For syphilis screening coverage, 2.1% (190) of the participants had missing data. If we assume that all missing responses indicate the participant did not receive the screening test, and include them as such in the denominator, coverage for syphilis screening in KwaZulu Natal decreased from 99.4% to 97.3%.



The denominator syphilis screening coverage was the number of women who completed the questionnaire. Missing data excluded
Figure 77: Maternal syphilis screening coverage among antenatal women, in the 2017, 2019, 2022 Antenatal HIV Survey, KwaZulu Natal

Of the women who had syphilis screening, 4.2% (365) were positive, 86.9% (7 503) were negative, 8.7% (755) had pending results, 0.2% (15) did not have results in file (Figure 50). Of those who had a test, combined 8.9% had missing results (either due to pending in the laboratory or due to not being in patient file). The lowest percent of missing results was in iLembe (0.4%) and the highest was in uMzinyathi (25.7%).

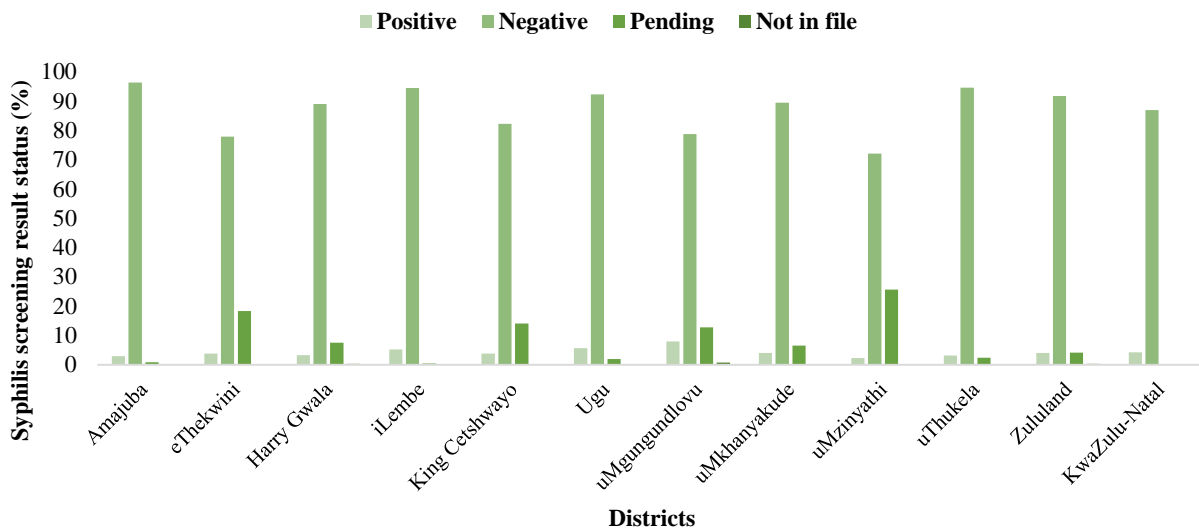
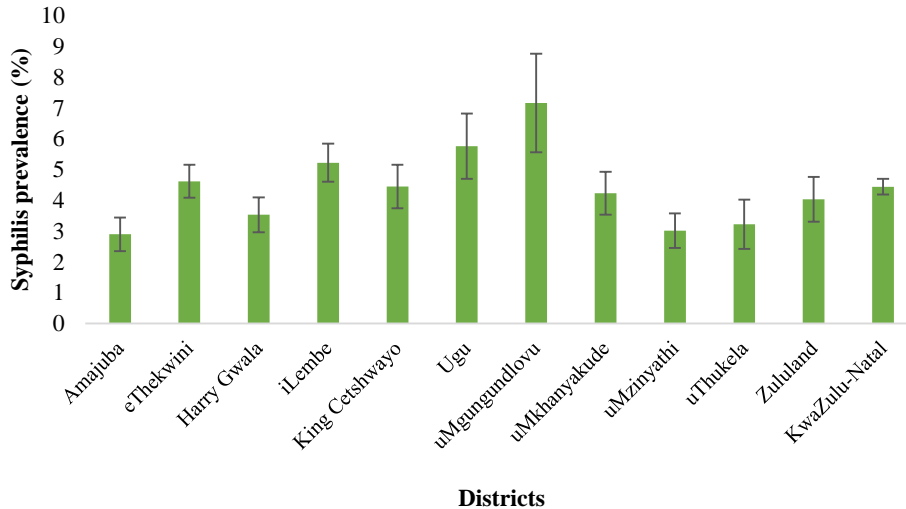


Figure 78: Maternal syphilis screening test result status by district, in the 2022 Antenatal HIV Sentinel Survey, KwaZulu Natal

Once the pending results and the results not in file were excluded, the prevalence of syphilis (per medical record review data) among those who had syphilis test result, was 4.4% (95% CI: 4.0 – 5.0) (Figure 51). In Amajuba the prevalence of syphilis was the lowest at 2.9% (95% CI: 2.0 – 7.2) and the highest was in uMgungundlovu at 7.2% (95% CI: 4.6 – 11.0).



The denominator syphilis prevalence was the number of women who received syphilis test results. Missing data excluded
Figure 79: Maternal syphilis prevalence among antenatal women, in the 2022 HIV Antenatal Survey, KwaZulu Natal

Among those who were syphilis-positive and whose syphilis treatment status was reported, 98.3% (348) received treatment for syphilis. Of those treated for syphilis and had type of treatment data reported (348), 93.1% (324) were treated with at least one dose of BPG (Figure 52). If we assume that all missing responses mean that the subjects did not receive treatment for syphilis and include as such the missing data in the denominator, the coverage of syphilis treatment decreases from 98.3% to 95.3%.

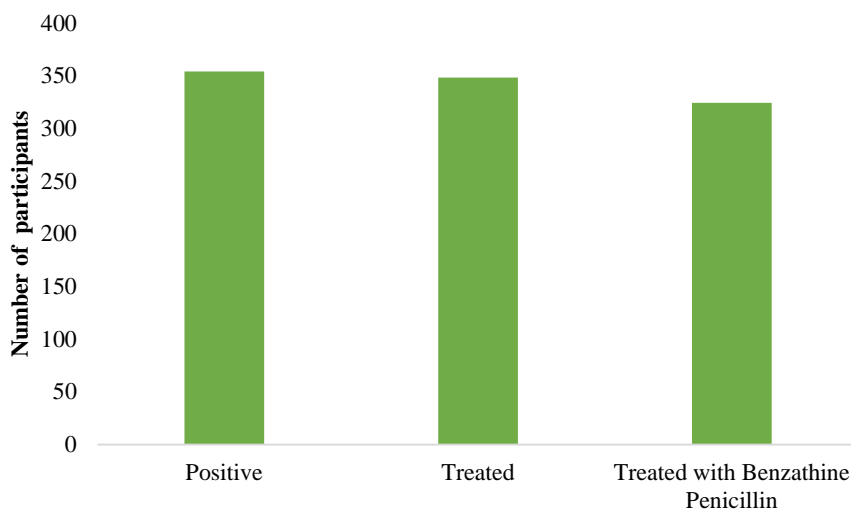


Figure 80: Syphilis treatment cascade among antenatal women, in the 2022 HIV Antenatal Survey, KwaZulu Natal

Limpopo

Sample size realization and demographic characteristics

The sample size realization in Limpopo was 104.0% (3 167). At district level, the number of women enrolled was 869 (26.4% of provincial total), 569 (17.3%), 554 (16.8%), 693 (21.1%) and 605 (18.4%) in Capricorn, Mopani, Sekhukhune, Vhembe, and Waterberg districts, respectively. Sample realization ranged from 98.0% in Waterberg to 119.0% in Sekhukhune. The majority of participants were aged 25-29 years (25.4%), and 20-24 years (24.9%) (Figure 53).

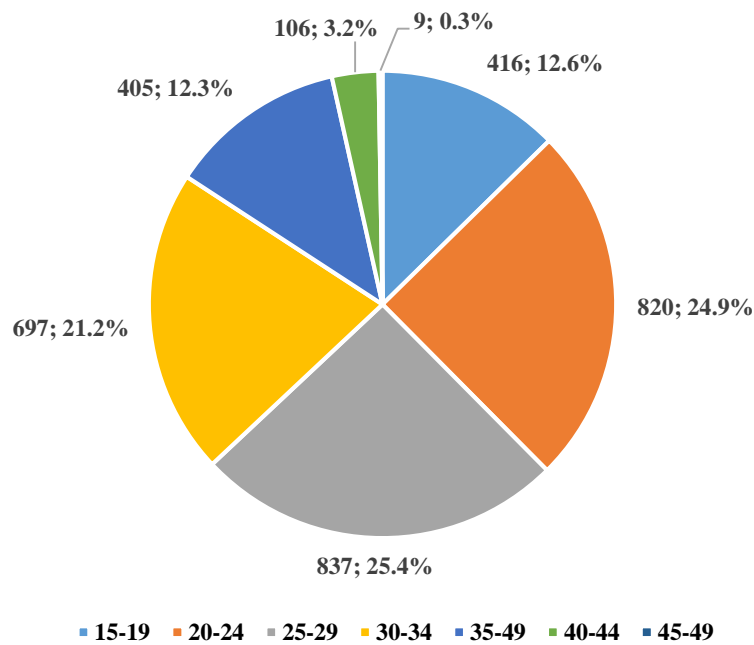
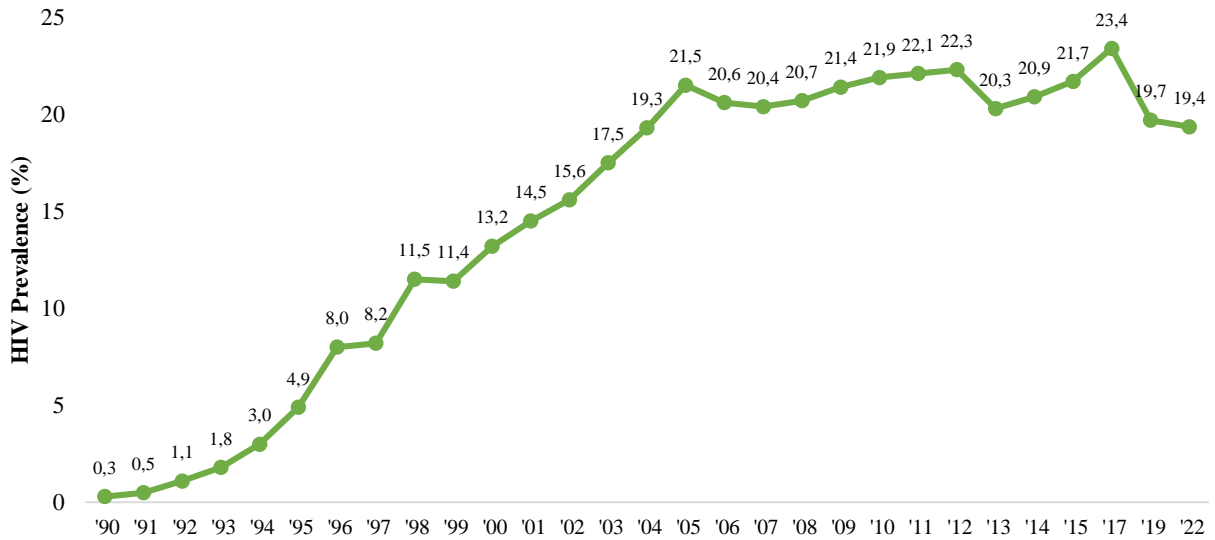


Figure 81: Distribution of survey participants by five-year age groups – Limpopo, Antenatal HIV Sentinel Survey, 2022

HIV prevalence

The HIV prevalence in Limpopo fluctuated between 21.5% to 23.4% between 2005 and 2017 and has declined ever since (Figure 54). In 2022, the HIV prevalence was 19.4% (95% CI: 18.2 – 20.5), which is 0.3% points lower than the prevalence reported in 2019 (19.7%, 95% CI: 18.4 – 21.2).



The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees

Figure 82: The HIV epidemic curve among antenatal women, Limpopo, 1990 – 2022, Antenatal HIV Sentinel Survey

HIV prevalence by district

In Limpopo, the highest HIV prevalence was in Waterberg at 24.5% (95% CI: 21.6 – 27.6) had followed by Mopani (20.6%, 95% CI: 17.4 – 24.2) (Figure 55). In this province, the district with the lowest HIV prevalence was Vhembe District at 13.1% (95% CI: 11.4 – 15.1). Overall, compared to the 2019 prevalence, the HIV prevalence decreased in all districts, except for the Sekhukhune district, which increased from 15.5% (2019) to 19.1% (2022).

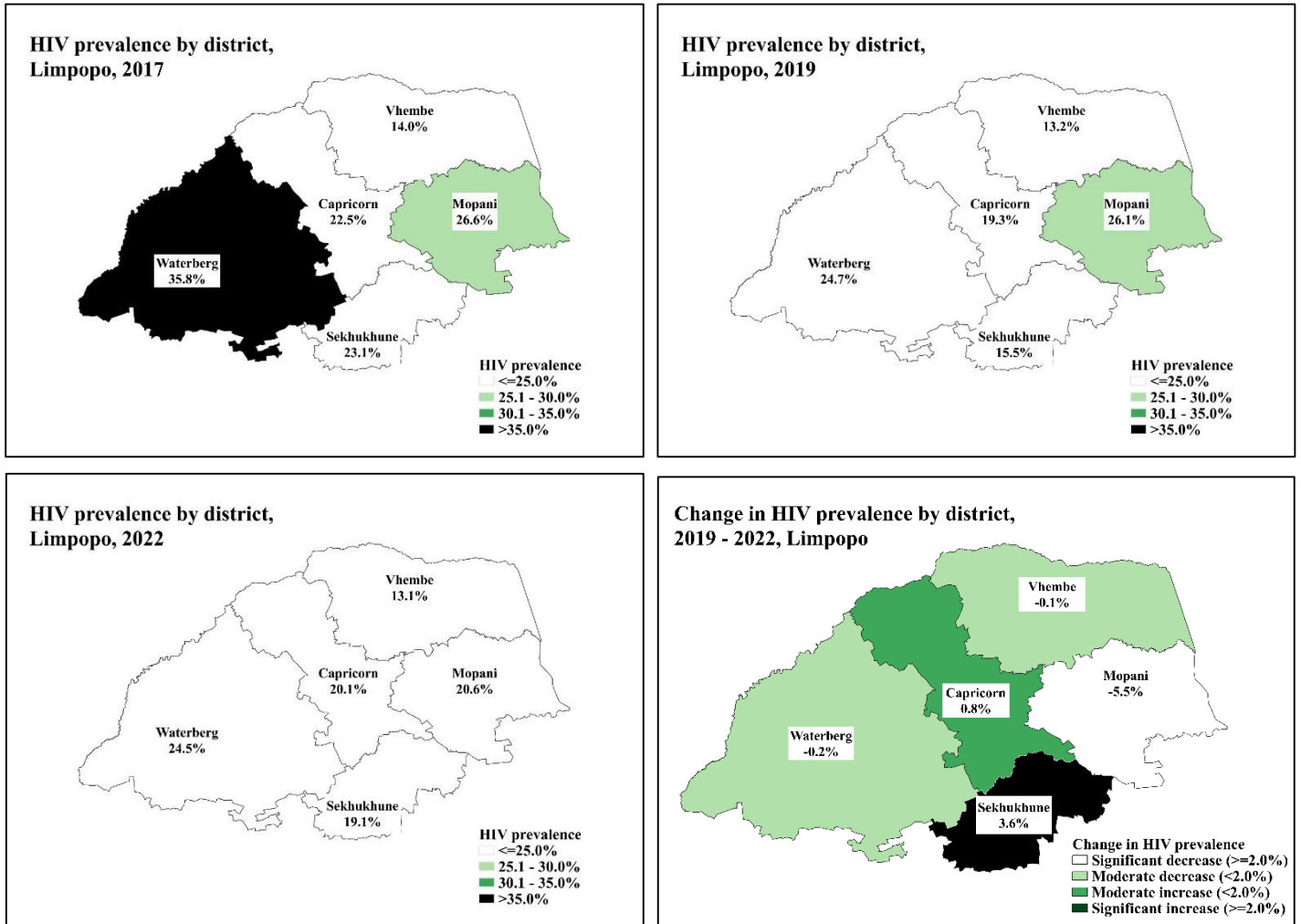
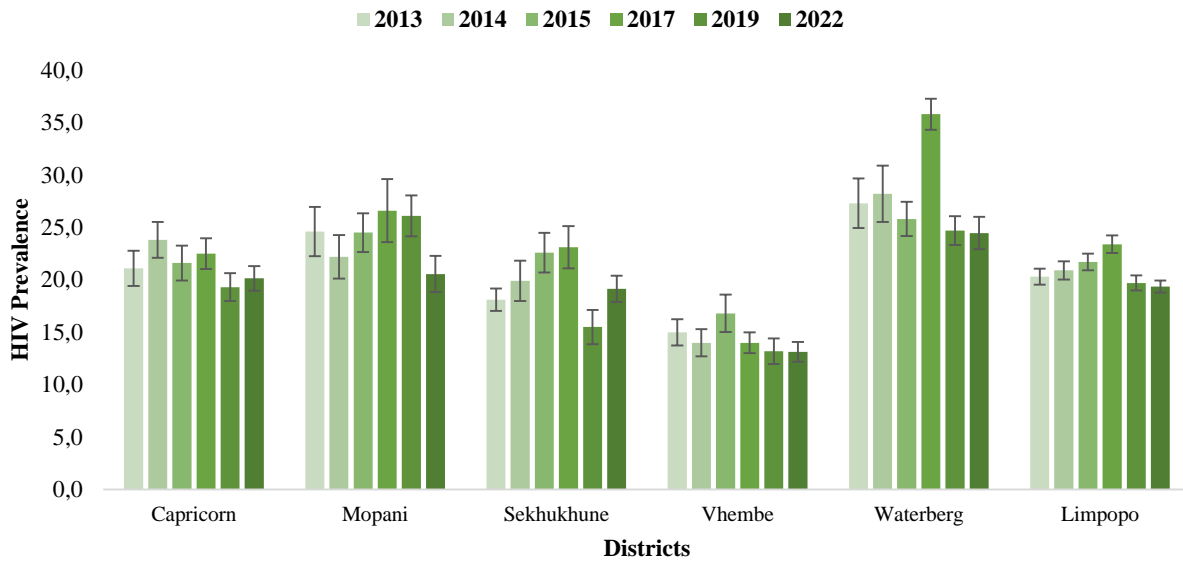


Figure 83: Change in district HIV prevalence estimates, 2017–2022, Antenatal HIV Sentinel Survey, Limpopo

The HIV prevalence trend for Limpopo from 2013 to 2022 is shown in Figure 56 and Table 5. At district level, the HIV prevalence ranged from 13.1% to 24.5% in Vhembe and Waterberg, respectively. Overall, the HIV prevalence declined from 2013 to 2022.



The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees. The confidence intervals are wide due to small sample size at district level

Figure 84: HIV prevalence trend by district, 2013–2022, Antenatal HIV Sentinel Survey, Limpopo

Table 5: HIV prevalence by district, in the Limpopo province, Antenatal HIV Sentinel Survey, 2013–2022

District	2013		2014		2015		2017		2019		2022	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Capricorn	21.1	18.0 - 24.6	23.8	20.6 - 27.3	21.6	18.5 - 25.0	22.5	19.8 - 25.5	19.3	16.8 - 22.0	20.1	17.9 - 22.6
Mopani	24.6	20.3 - 29.5	22.2	18.4 - 26.5	24.5	21.1 - 28.3	26.6	21.1 - 32.9	26.1	22.4 - 30.1	20.6	17.4 - 24.2
Sekhukhune	18.1	16.1 - 20.3	19.9	16.4 - 23.9	22.6	19.1 - 26.5	23.1	19.4 - 27.3	15.5	12.6 - 19.0	19.1	16.8 - 21.7
Vhembe	15.0	12.7 - 17.6	14.0	11.7 - 16.8	16.8	13.6 - 20.6	14.0	12.2 - 16.1	13.2	11.0 - 15.8	13.1	11.4 - 15.1
Waterberg	27.3	22.9 - 32.2	28.2	23.2 - 33.7	25.8	22.7 - 29.1	35.8	33.0 - 38.8	24.7	22.1 - 27.5	24.5	21.6 - 27.6
Limpopo	20.3	18.9 - 21.9	20.9	19.2 - 22.6	21.7	20.1 - 23.2	23.4	21.8 - 25.1	19.7	18.4 - 21.2	19.4	18.2 - 20.5

The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees

PMTCT cascade – the first and second 95

Based on medical records review, 99.7%⁸ (3 034) of women attending ANC were offered HIV testing or already knew their HIV positive status. Among the ANC attendees who were offered the test, 99.97% (3 034) accepted the offered test or already knew their HIV-positive status. From the 637 participants found to be HIV-positive by EIA test, 91.7% (584) already knew their HIV-positive status at the time of the survey (Figure 57). By district, Vhembe had the lowest knowledge of HIV status (86.8%) and Waterberg district had the highest knowledge of HIV status at 95.3%.

Among those who knew their HIV-positive status, excluding 12 participants whose treatment status was not reported, 98.1% (572) had initiated ART at the time of the survey. At a district level, among those who knew their status, ART initiation ranged from 97.5% (in Capricorn and Vhembe) to 100.0% in Sekhukhune district. Initiation of ART increased between 2019 and 2022 in 4 of the districts in Limpopo (Vhembe decreased from 100.0% in 2019 to 97.5% in 2022).

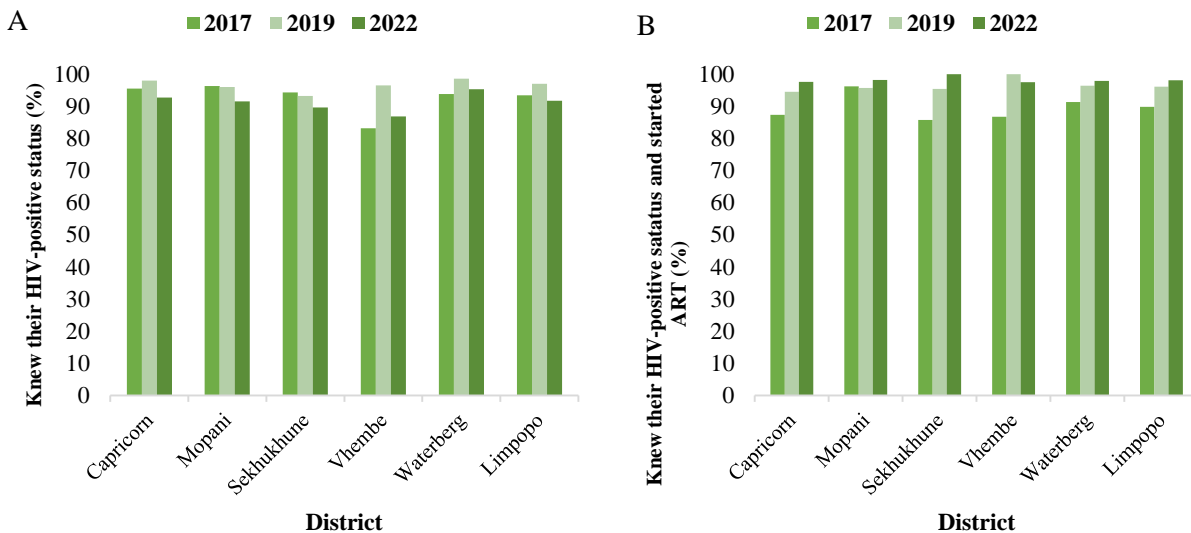


Figure 85: Knowledge of HIV-positive status and ART initiation at the time of the survey by district, in the 2017, 2019 and 2022 Antenatal HIV Sentinel Surveys, Limpopo

Knowledge of HIV-positive status and ART initiation before pregnancy

In Limpopo, knowledge of HIV status before pregnancy was 73.7%, which was lower than the national average (78.1%). Among those who knew their HIV-positive status prior to pregnancy and had a reported treatment status (371), 84.1% (312) started ART before pregnancy (Figure 58).

At district level, knowledge of HIV status before pregnancy ranged from 63.4% in Sekhukhune, to 79.8% in Vhembe in 2022. The lowest ART initiation before pregnancy was in Mopani (75.3%) and the highest ART initiation before pregnancy was in Vhembe (90.7%). The

⁸248 (7.5%) missing response excluded when calculating percentage

percentage of women who knew their HIV-positive status and initiated ART prior to pregnancy decreased in all districts compared to 2019.

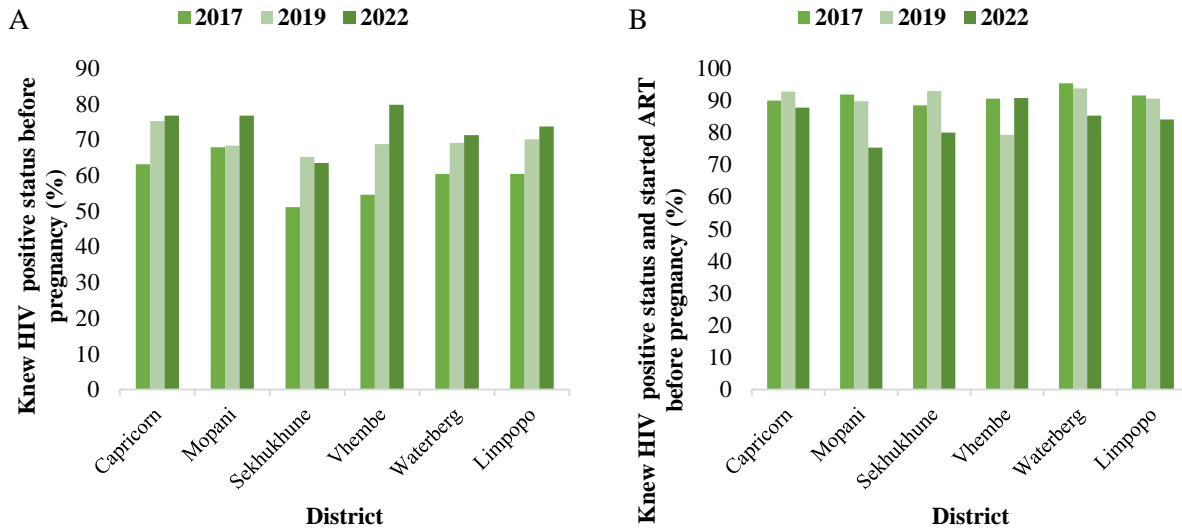


Figure 86: Knowledge of HIV-positive status and ART initiation before pregnancy by district, in the 2017, 2019 and 2022 Antenatal HIV Sentinel Surveys, Limpopo

Viral Load Monitoring

In Limpopo, viral load testing coverage was 86.6% (329 out of 380) and it was greater than 79.0% across all districts in the province (Figure 59). Among those who had a viral load test done and were due for a viral load test, 78.1% (257/329) had received their viral load results. Viral suppression (<50 copies/ml) was at 59.9% (154/257) among those who had a viral load test done and received results.

At a district level, Sekhukhune had the lowest viral load testing coverage (79.3%, 95% CI: 62.5 – 89.8%) and highest viral load testing coverage was in Waterberg (89.4%, 95% CI: 81.3 – 94.3%). In Vhembe, only 63.8% (95% CI: 54.1 – 72.6) had received viral load test results while in Capricorn 84.9% (95% CI: 76.4 – 90.6%) had received results. Mopani had the lowest viral load suppression at 51.9% (95% CI: 39.7 – 63.9%) and the highest was at 66.1% (95% CI: 54.2 – 76.3) in Waterberg.

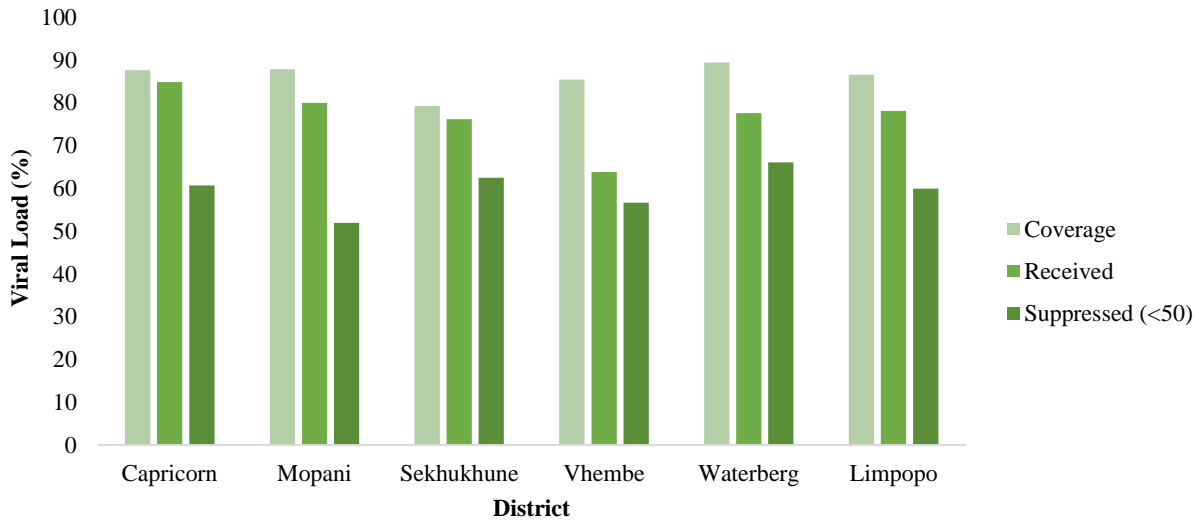


Figure 87: Viral load testing among antenatal women by district, in the 2022 HIV Antenatal Survey, Limpopo

PrEP Coverage

In Limpopo, 42.5% (961 out of 2 259) of HIV negative women were PrEP eligible. Of those who were PrEP eligible and whose prior use of PrEP use was reported, prior use of PrEP was 0.8% (95% CI: 0.5 – 1.5) (Figure 60). Prior PrEP use was not reported in Mopani, and the highest prior use of PrEP was in Sekhukhune district at 1.4% (95% CI: 0.5 – 4.4). Among PrEP eligible women whose current use of PrEP was reported, 0.1% (95% CI: 0.0 – 0.5) were taking PrEP in the current pregnancy. Only the Capricorn district reported current PrEP use during current pregnancy (0.4%, 95% CI: 0.1 – 1.7) in this province.

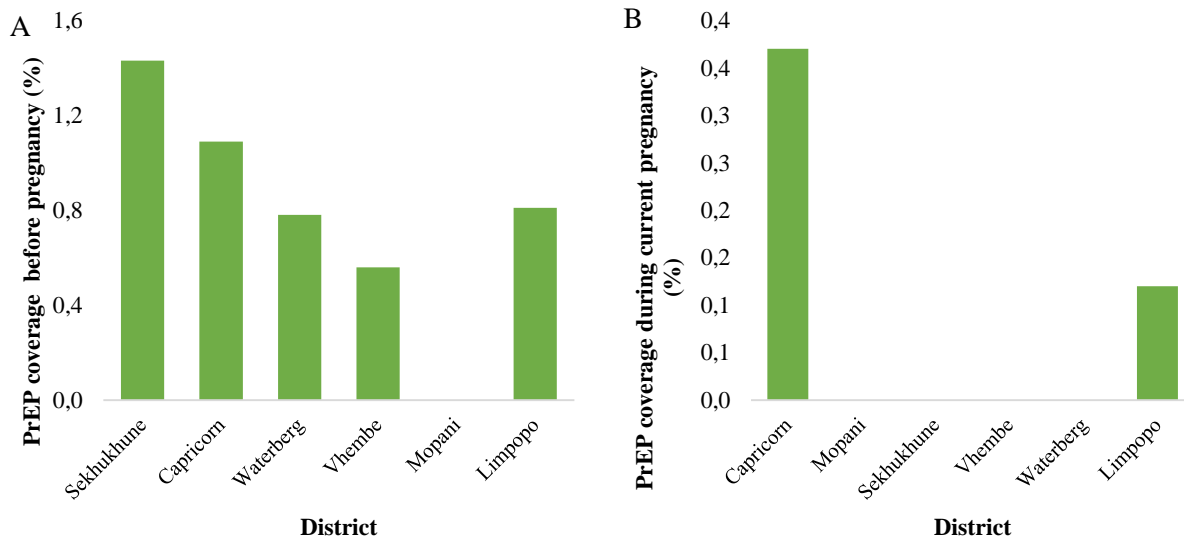


Figure 88: PrEP coverage before pregnancy (A) and during current pregnancy (B) by district, in the 2022 Antenatal HIV Sentinel Survey, Limpopo

Early ANC attendance

In Limpopo, 23.3% of the participants attended their first-ANC-visit before or at 12 weeks of pregnancy (Figure 61), while 60.7% attended their first-ANC-visit before 20 weeks of gestational age. At a district level, Sekhukhune had the lowest attendance of ANC before 20 weeks (54.4%) and Mopani had the highest attendance of ANC before 20 weeks (69.6%). Attendance of ANC before 20 weeks was lower than the national average (61.0%) among women with high (≥ 4) gravidity (55.7%), single women (57.7%), those with no education (52.9%) or primary education (54.8%), adolescent girls (53.4%) and those older than 40 years (57.3%).

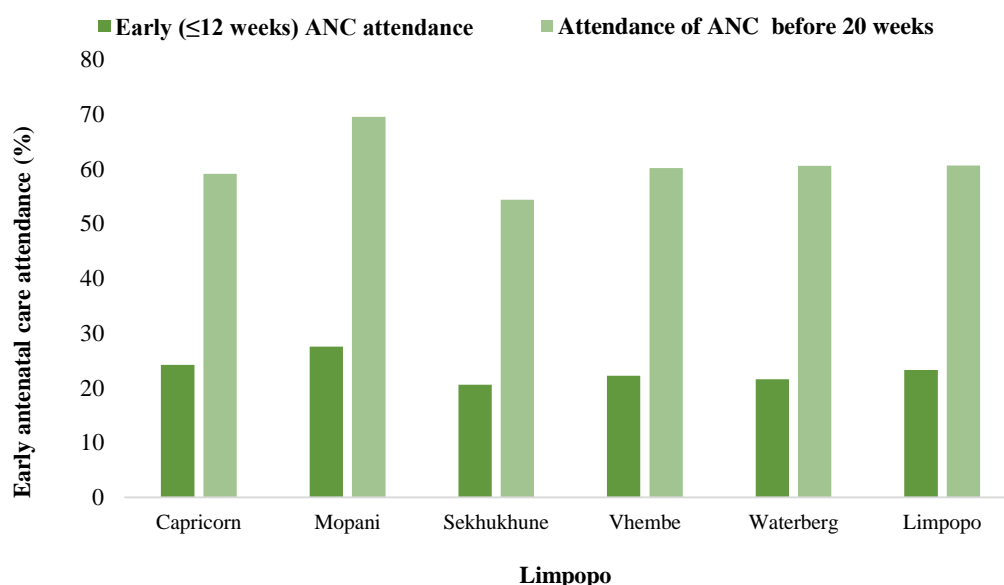
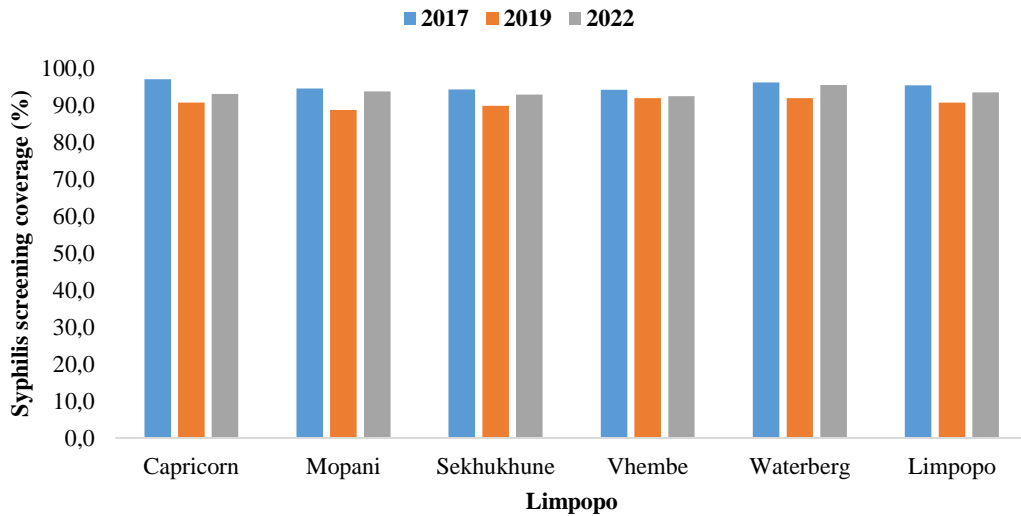


Figure 89: Early attendance of antenatal care by province in the 2022 Antenatal HIV Sentinel Survey, Limpopo

Maternal syphilis screening and treatment coverage

For Limpopo, maternal syphilis screening coverage was 93.6%, which was an increase from 2019 (90.8%) (Figure 62). All districts in Limpopo had syphilis screening coverage greater than 92.0%.

For syphilis screening coverage, 4.2% (139) of the participants had missing data. If we assume that all missing responses indicate the participant did not receive the screening test, and include them as such in the denominator, coverage for syphilis screening in Limpopo decreased from 93.6% to 89.6%.



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

Figure 90: Maternal syphilis screening coverage among antenatal women, in the 2017, 2019, 2022 Antenatal HIV Survey, Limpopo

Of the women who had syphilis screening, 1.5% (41) were positive, 71.5% (2 011) were negative, 24.6% (691) had pending results, 2.4% (68) did not have results in file (Figure 63). Of those who had a test, combined 27.0% had missing results (either due to pending in the laboratory or due to not being in patient file). The lowest percent of missing results was in Mopani (19.4%) and the highest was in Sekhukhune (39.7%).

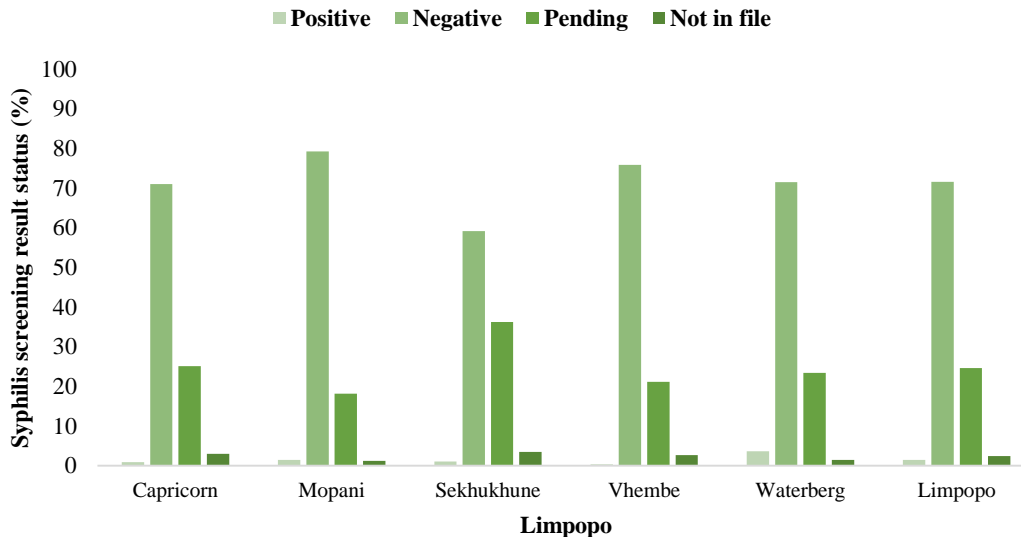
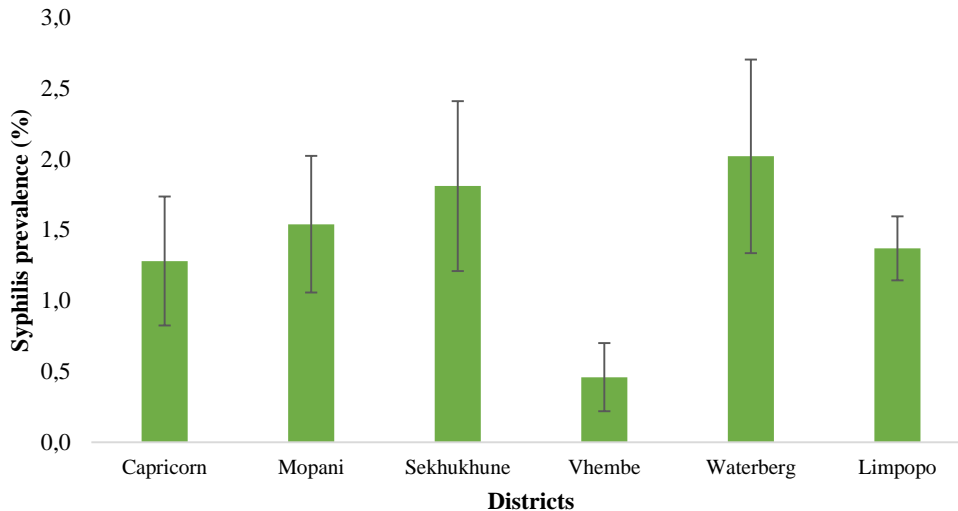


Figure 91: Maternal syphilis screening test result status by district, in the 2022 Antenatal HIV Sentinel Survey, Limpopo

After excluding the pending results and the results not in file, the prevalence of syphilis (per medical record review data) among those who had syphilis test result, was 1.4% (95% CI: 1.0 – 1.9) in Limpopo (Figure 64). The prevalence of syphilis was lowest in Vhembe at 0.5% (95% CI: 0.2 – 1.3%) and the highest was in Waterberg at 2.0% (95% CI: 1.0 – 3.9).



The denominator syphilis prevalence was the number of women who received syphilis test results. Missing data excluded
Figure 92: Maternal syphilis prevalence among antenatal women, in the 2022 HIV Antenatal Survey, Limpopo

Among those who were syphilis-positive and whose syphilis treatment status was reported (39), 100% (39) received treatment for syphilis. Of those treated for syphilis and had type of treatment data reported (39), 82.05% (32) were treated with at least one dose of BPG (Figure 65). If we assume that all missing responses mean that the subjects did not receive treatment for syphilis and include as such the missing data in the denominator, the coverage of syphilis treatment decreases from 100.0% to 95.1%.

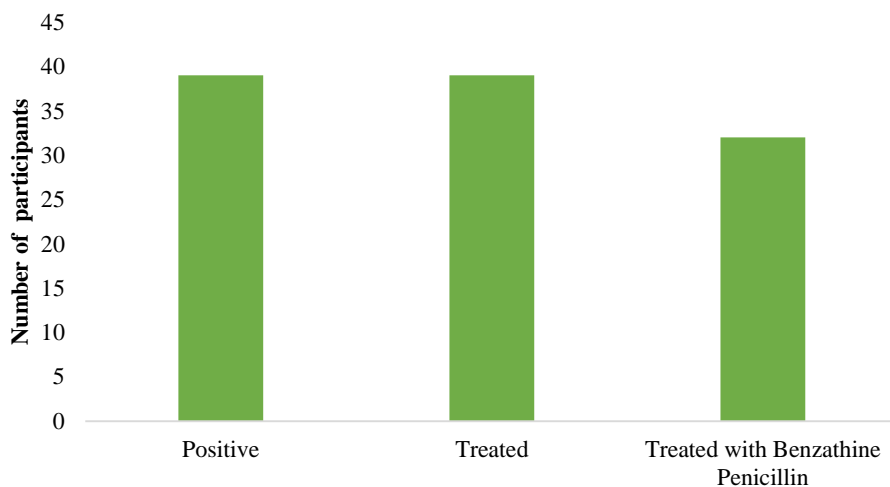


Figure 93: Syphilis treatment cascade among antenatal women, in the 2022 HIV Antenatal Survey, Limpopo

Mpumalanga

Sample size realization and demographic characteristics

The sample size realization in Mpumalanga was 114.0% (3 365). At district level, the total number of women enrolled was 700 (20.8% of provincial total), 1 240 (36.9% and 1 425 (42.4%) in Gert Sibande, Nkangala and Ehlanzeni, respectively. Sample realization ranged from 106.0% in Nkangala to 123.0% in Gert Sibande. The majority of participants were aged 20-24 years (25.3%), 25-29 years (24.8%) and 30-34 years (20.5%) (Figure 66).

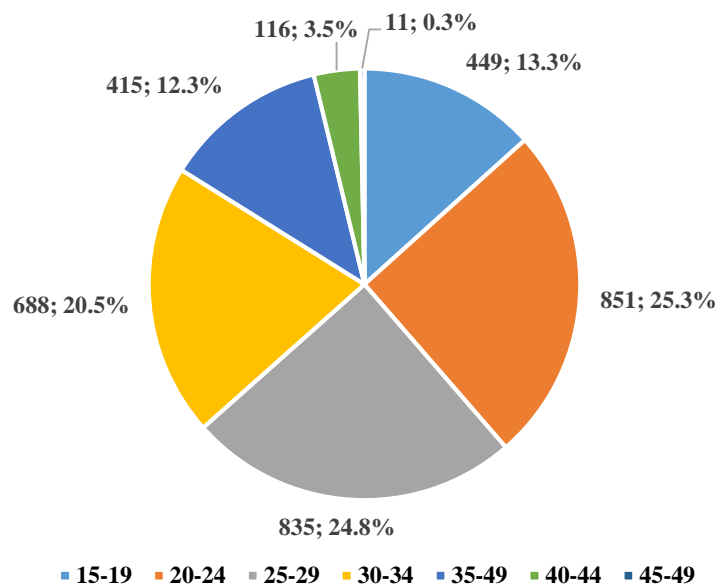
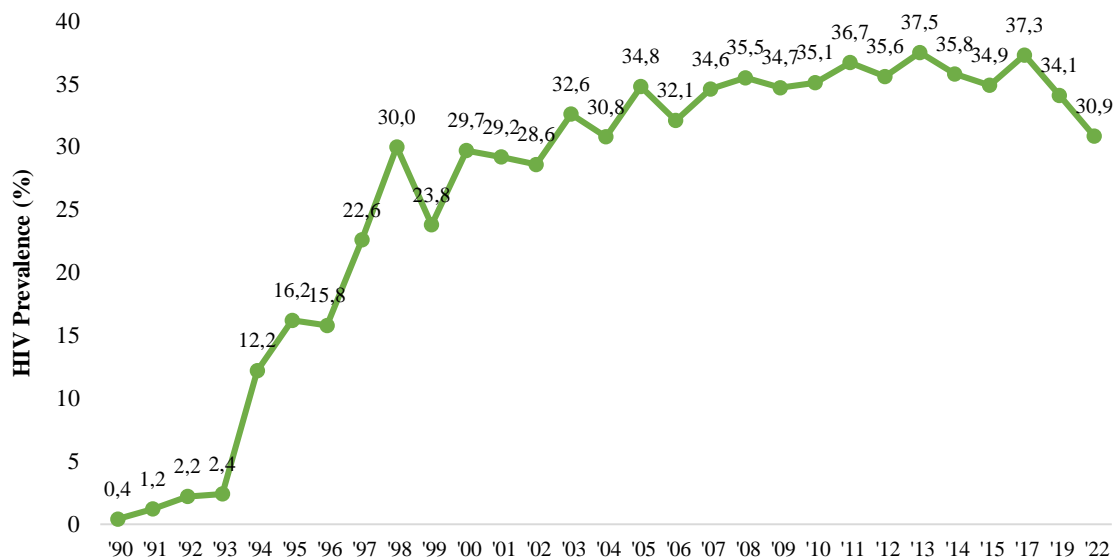


Figure 94: Distribution of survey participants by five-year age groups – Mpumalanga, Antenatal HIV Sentinel Survey, 2022

HIV prevalence

The HIV prevalence in Mpumalanga fluctuated between 35.5% to 37.3% between 2008 and 2017 and has declined ever since (Figure 67). In 2022, the HIV prevalence was 30.9% (95% CI: 29.2 – 32.5%), which is 3.3% points lower than the prevalence reported in 2019 (34.1%, 95% CI: 32.4 – 35.9).



The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees

Figure 95: The HIV epidemic curve among antenatal women, Mpumalanga, 1990 – 2022, Antenatal HIV Sentinel Survey

HIV prevalence by district

In Mpumalanga, Gert Sibande 36.7%, 95% CI: 33.1 – 40.1) had the highest HIV prevalence followed by Ehlanzeni (30.9%, 95% CI: 28.2 – 33.7) (Figure 68). In this province the district with the lowest HIV prevalence was Nkangala District at 37.5% (95% CI: 25.0 – 30.2). Overall, compared to the 2019 prevalence, the HIV prevalence decreased in all districts with Ehlanzeni and Gert Sibande recording decreases greater than the national average

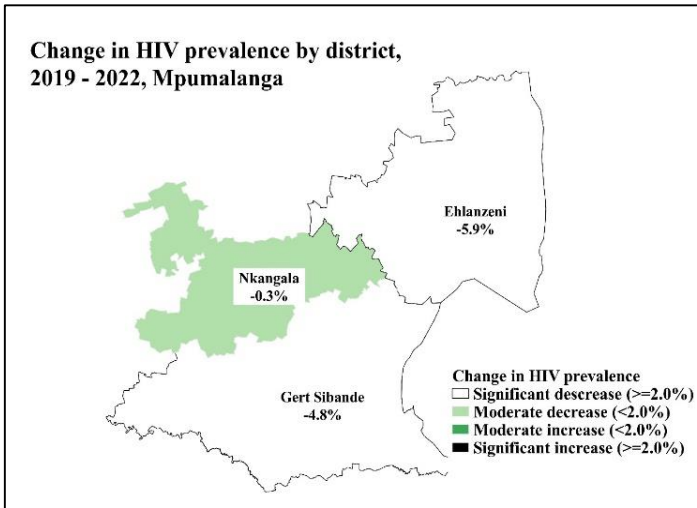
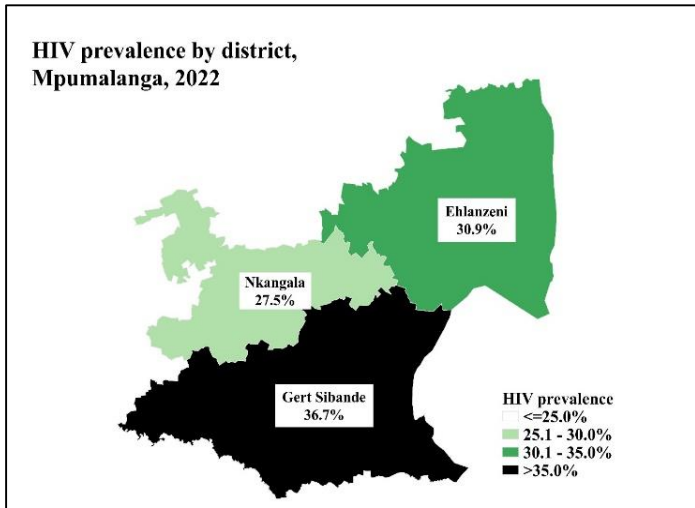
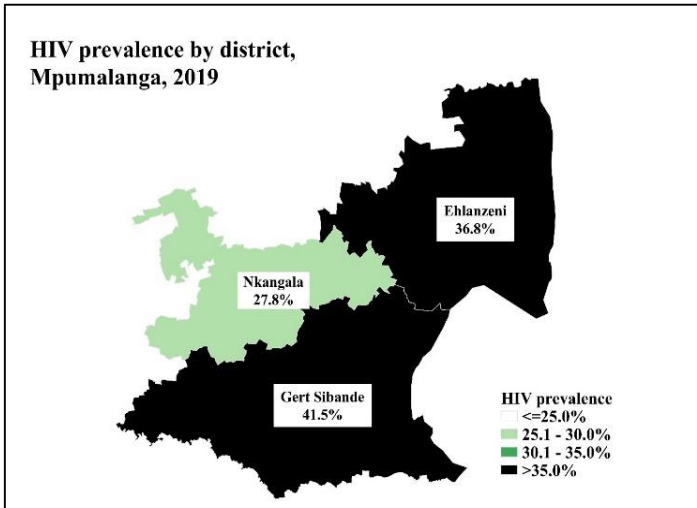
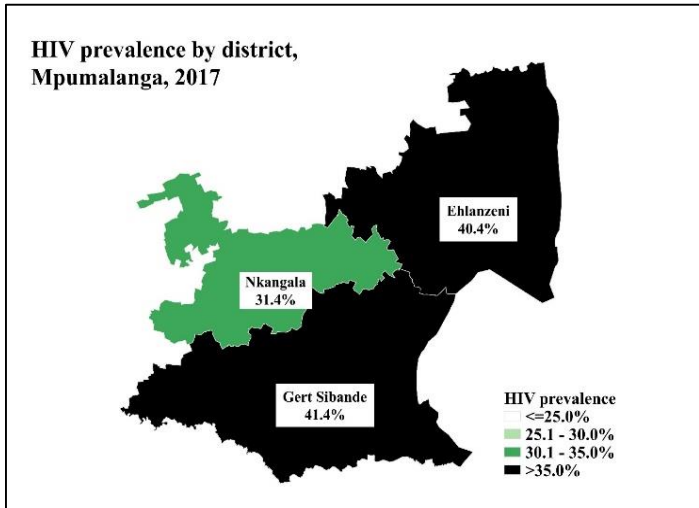
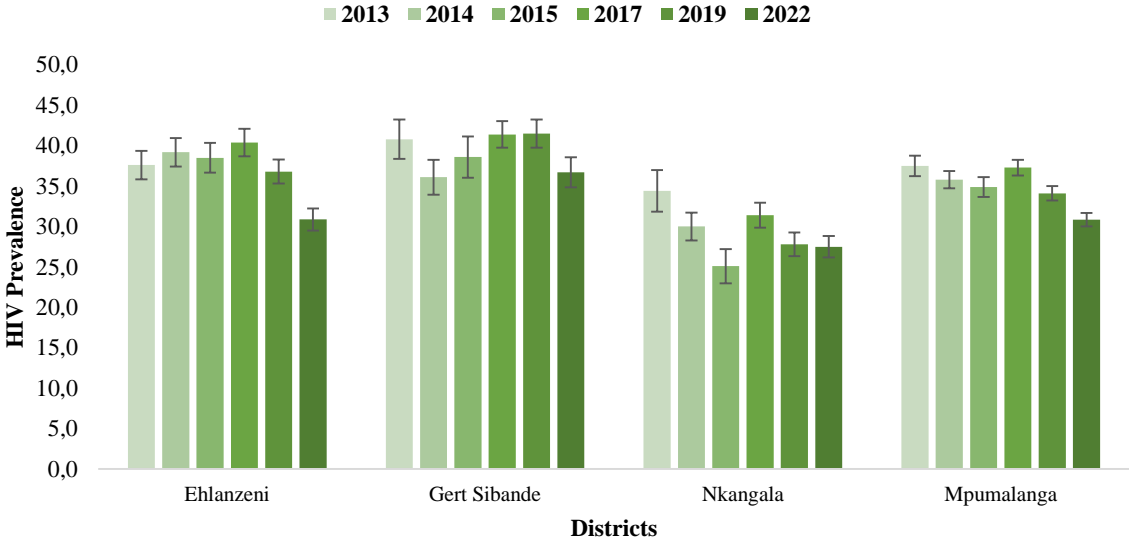


Figure 96: Change in district HIV prevalence estimates, 2017–2022, Antenatal HIV Sentinel Survey, Mpumalanga

The HIV prevalence trend for Mpumalanga from 2013 to 2022 is shown in Figure 69 and Table 6. At district level, the HIV prevalence ranged from 27.5% to 36.7% in Nkangala and Gert Sibande, respectively. Overall, the HIV prevalence declined from 2013 (37.5%) to 2022 (30.9%).



The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees. The confidence intervals are wide due to small sample size at district level

Figure 97: HIV prevalence trend by district, 2013–2022, Antenatal HIV Sentinel Survey, Mpumalanga

Table 6: HIV prevalence by district, in the Mpumalanga province, Antenatal HIV Sentinel Survey, 2013–2022

District	2013		2014		2015		2017		2019		2022	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Ehlanzeni	37.6	34.2 - 41.1	39.2	35.8 - 42.7	38.5	35.0 - 42.2	40.4	37.1 - 43.8	36.8	33.9 - 39.7	30.9	28.2 - 33.7
Gert Sibande	40.8	36.1 - 45.6	36.1	32.0 - 40.4	38.6	33.7 - 43.7	41.4	38.2 - 44.7	41.5	38.1 - 45.0	36.7	33.1 - 40.5
Nkangala	34.4	29.5 - 39.6	30.0	26.7 - 33.5	25.1	21.2 - 29.5	31.4	28.5 - 34.5	27.8	25.0 - 30.8	27.5	25.0 - 30.2
Mpumalanga	37.5	35.1 - 40.0	35.8	33.7 - 37.9	34.9	32.5 - 37.3	37.3	35.4 - 39.2	34.1	32.4 - 35.9	30.9	29.2 - 32.5

The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees

PMTCT cascade – the first and second 95

Based on medical records review, 99.97%⁹ (3 141) of women attending ANC were offered HIV testing or already knew their HIV positive status. Most of the ANC attendees offered the test accepted (100.0%, 3 083) accepted the offered test or already knew their HIV–positive status. From the 1 038 participants found to be HIV-positive by EIA test, 94.9% (985) already knew their HIV-positive status at the time of the survey (Figure 70). By district, Nkangala had the lowest knowledge of HIV status (93.8%) while Gert Sibande and Ehlanzeni Districts had knowledge of HIV status at 95.3% and 95.5%, respectively.

Among those who knew their HIV-positive status, excluding 12 participants whose treatment status was not reported, 99.3% (973) had initiated ART at the time of the survey. At a district level, among those who knew their status, ART initiation ranged from 98.7% (Nkangala) to 99.2% and 99.8% in Gert Sibande and Ehlanzeni districts. Initiation of ART increased between 2019 and 2022 in all districts in the province.

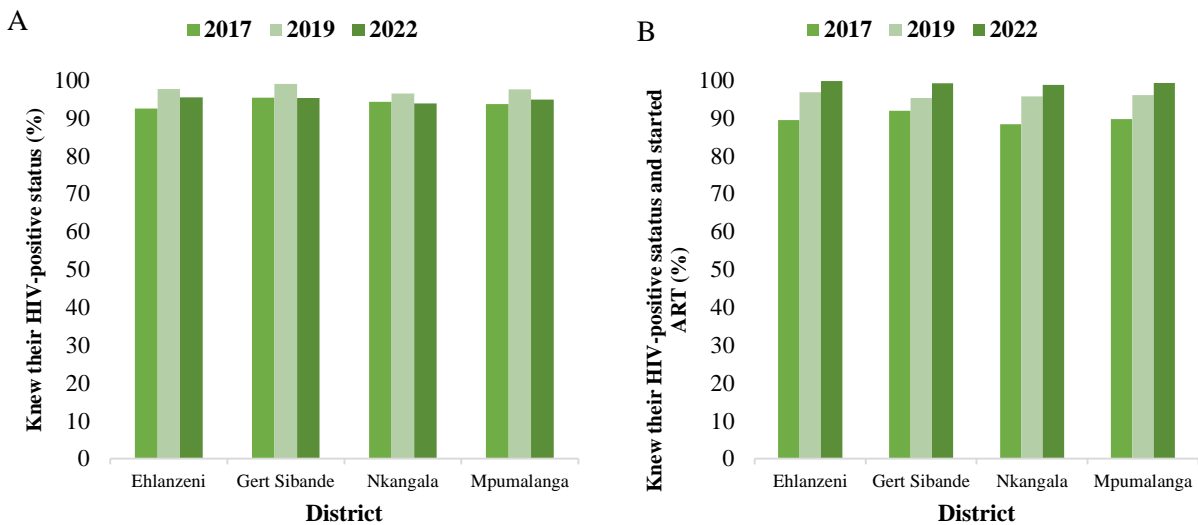


Figure 98: Knowledge of HIV-positive status and ART initiation at the time of the survey by district, in the 2017, 2019 and 2022 Antenatal HIV Sentinel Surveys, Mpumalanga

Knowledge of HIV-positive status and ART initiation before pregnancy

In Mpumalanga, knowledge of HIV status before pregnancy was 78.5%, which was similar to the national average (78.1%). Among those who knew their HIV-positive status prior to pregnancy and had a reported treatment status (656), 88.9% (583/656) started ART before pregnancy (Figure 71).

At district level, knowledge of HIV status before pregnancy was 77.2% in Ehlanzeni, 77.4% in Nkangala and 82.2% in Gert Sibande in 2022. The Nkangala district had the lowest ART initiation before pregnancy (88.6%) and the highest ART initiation before pregnancy was in Ehlanzeni (91.1%). In all districts, the percentage of women who knew their HIV-positive status and initiated ART prior to pregnancy decreased compared to 2019.

⁹224 (6.6%) missing response excluded when calculating percentage

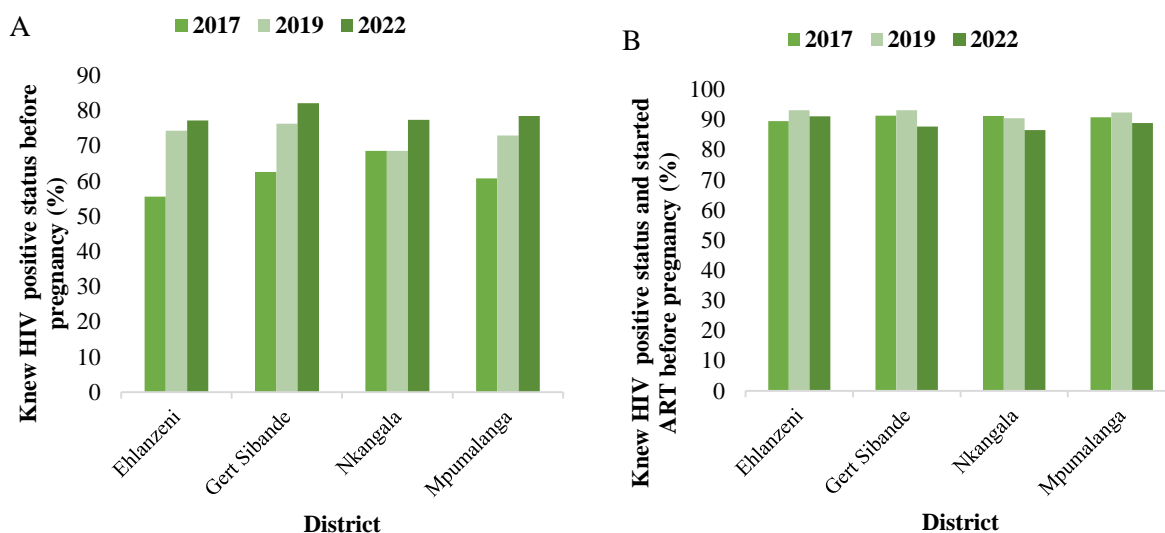


Figure 99: Knowledge of HIV-positive status and ART initiation before pregnancy by district, in the 2017, 2019 and 2022 Antenatal HIV Sentinel Surveys, Mpumalanga

Viral Load Monitoring

In Mpumalanga, viral load testing coverage was 88.8% (593 out of 668) and it was greater than 87.0% across all districts in the province (Figure 72). Among those who had a viral load test done and were due for a viral load test, 81.6% (484) had received their viral load results. Of those who had a viral load test done and received results, viral suppression (<50 copies/ml) was at 71.9% (384).

At the district level, Gert Sibande had the lowest viral load testing coverage (87.88%, 95% CI: 81.1 – 92.5%) and highest viral load testing coverage was in Nkangala (89.4%, 95% CI: 84.1 – 93.1). In Nkangala, however, only 75.3% (95% CI: 68.4 – 81.1) had received viral load test results while in Ehlanzeni 86.3% (95% CI: 80.2 – 90.7) had received results. Viral load suppression was the lowest in Nkangala at 67.86% (95% CI: 58.2 - 76.2) and the highest was at 78.8% (95% CI: 71.9 – 84.4) in Gert Sibande.

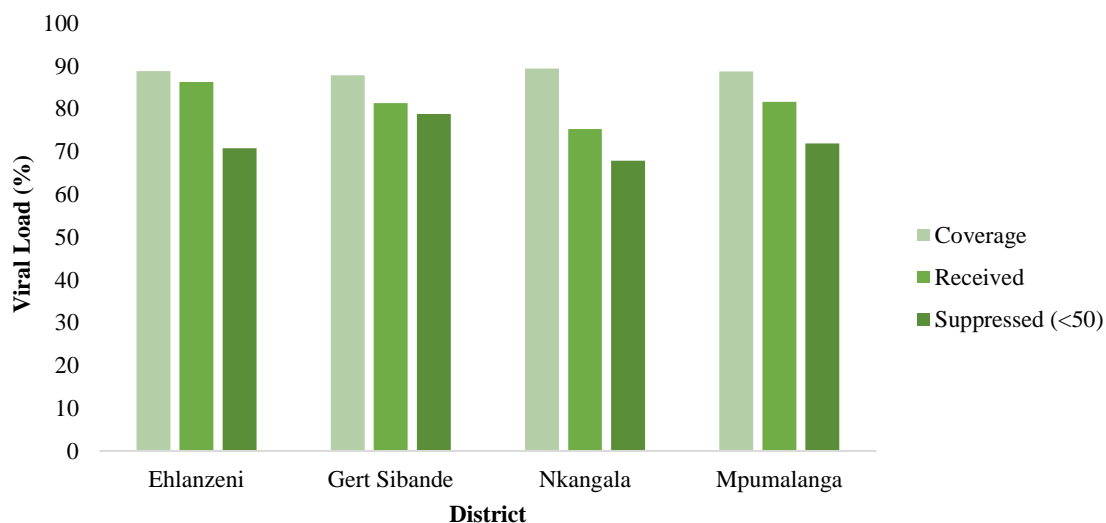


Figure 100: Viral load testing among antenatal women by district, in the 2022 HIV Antenatal Survey, Mpumalanga

PrEP Coverage

In Mpumalanga, 42.1% (820 out of 1 946) of HIV negative women were PrEP eligible. This proportion of PrEP eligibility among HIV negative women was generally low compared to other provinces. Of those who were PrEP eligible and whose prior use of PrEP use was reported, prior use of PrEP was 6.2% (95% CI: 4.8 – 7.9) (Figure 73). Prior use of PrEP was the lowest in Nkangala district (5.4% of eligible women), higher in Ehlanzeni (5.8% of eligible) and the highest in Gert Sibande (8.6%). Among PrEP eligible women whose current use of PrEP was reported, 14.3% (95% CI: 11.2 – 18.0) were taking PrEP in the current pregnancy. The Gert Sibande District had the highest proportion of eligible women on PrEP during current pregnancy (30.3%, 95% CI: 21.6 – 40.7), followed by Ehlanzeni and Nkangala districts at 10.3% (95% CI: 7.0 – 15.0) and 10.3% (95% CI: 5.8 – 17.6).

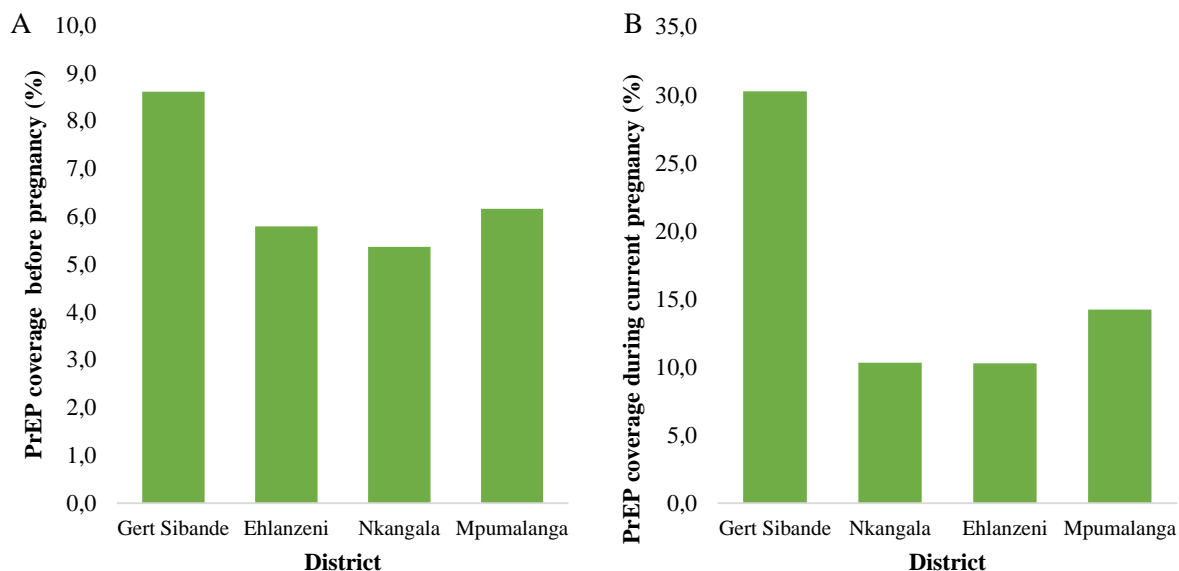


Figure 101: PrEP coverage before pregnancy (A) and during current pregnancy (B) by district, in the 2022 Antenatal HIV Sentinel Survey, Mpumalanga

Early ANC attendance

In Mpumalanga, 22.1% of the participants attended their first-ANC-visit before or at 12 weeks of pregnancy (Figure 74), while 57.1% attended their first-ANC-visit before 20 weeks of gestational age. At a district level, the lowest attendance of ANC before 20 weeks was in Gert Sibande (54.1%) and the highest was in Ehlanzeni (59.8%). Attendance of ANC before 20 weeks was lower than the national average (61.0%) overall and even lower among women with high (≥ 4) gravidity (55.2%), single women (26.3%), those with no education (59.3%) or primary education (53.6%), adolescent girls (48.8%) and those older than 40 years (57.0%).

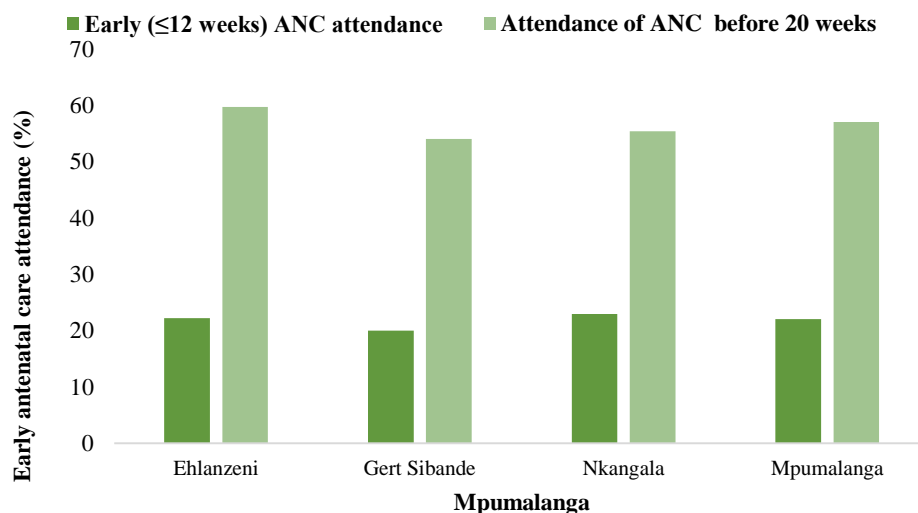
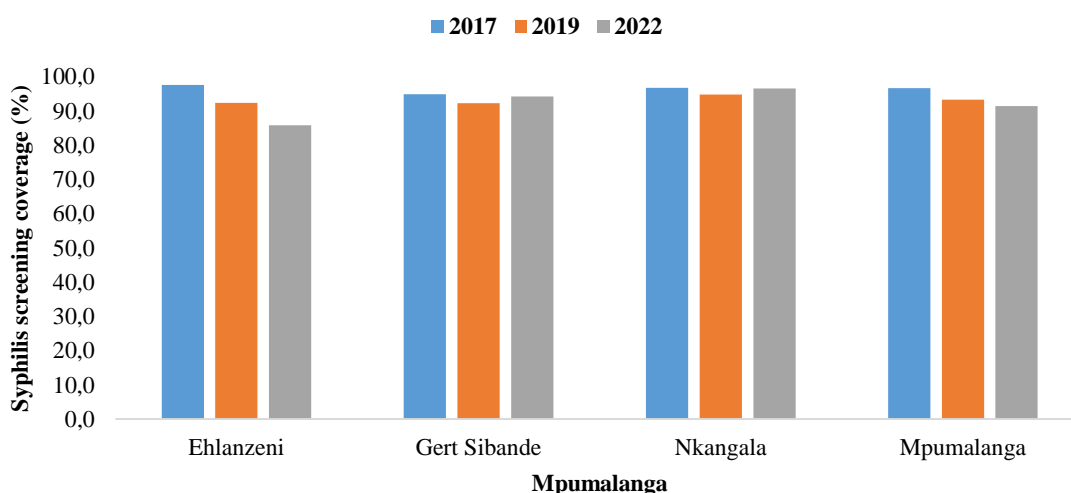


Figure 102: Early attendance of antenatal care by province in the 2022 Antenatal HIV Sentinel Survey, Mpumalanga

Maternal syphilis screening and treatment coverage

For Mpumalanga, maternal syphilis screening coverage was 91.4%, which was a decrease from 2019 (93.2%) (Figure 75). All districts in the province had syphilis screening coverage greater than 90% with the exception of Ehlanzeni at 85.8%.

For syphilis screening coverage 4.28% (144) of the participants had missing data. If we assume that all missing responses indicate the participant did not receive the screening test, and include them as such in the denominator, coverage for syphilis screening in Mpumalanga decreased from 91.4% to 87.5%.



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

Figure 103: Maternal syphilis screening coverage among antenatal women, in the 2017, 2019, 2022 Antenatal HIV Survey, Mpumalanga

Of the women who had syphilis screening, 1.8% (49) were positive, 75.4% (2 082) were negative, 21.2% (585) had pending results, 1.7% (46) did not have results in file (Figure 76). Of those who had a test, combined 22.9% had missing results (either due to pending in the laboratory or due to not being in patient file). The lowest percent of missing results was in Ehlanzeni (17.7%) and the highest was in Nkangala (27.6%).

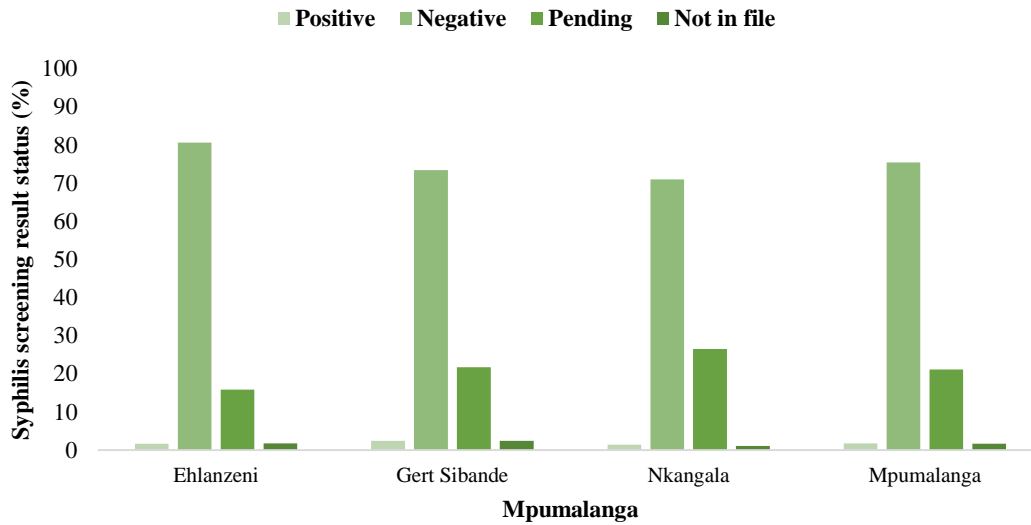
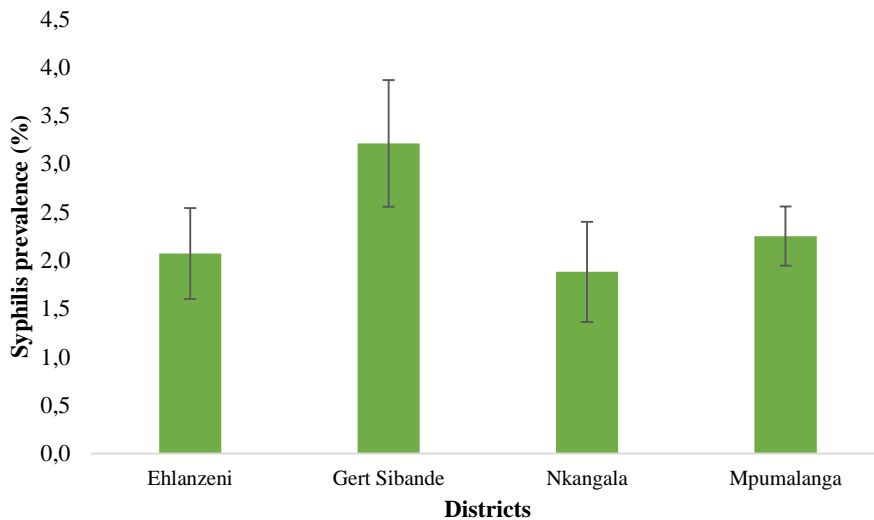


Figure 104: Maternal syphilis screening test result status by district, in the 2022 Antenatal HIV Sentinel Survey, Mpumalanga

Once the pending results and the results not in file were excluded, the prevalence of syphilis (per medical record review data) among those who had syphilis test result, was 2.3% (95% CI: 1.7 – 3.0) overall (Figure 77). In Nkangala the prevalence of syphilis was lowest at 1.9% (95% CI: 1.1 – 3.4) and the highest was in Gert Sibande at 3.2% (95% CI: 2.1 – 4.8).



The denominator syphilis prevalence was the number of women who received syphilis test results. Missing data excluded
Figure 105: Maternal syphilis prevalence among antenatal women, in the 2022 HIV Antenatal Survey, Mpumalanga

Among those who were syphilis-positive and whose syphilis treatment status was reported (45), 93.3% (42) received treatment for syphilis. Of those treated for syphilis and had type of treatment data reported (42), 83.3% (35) were treated with at least one dose of BPG (Figure 78). If we assume that all missing responses mean that the subjects did not receive treatment for syphilis and include as such the missing data in the denominator, the coverage of syphilis treatment decreases from 93.3% to 85.7%.

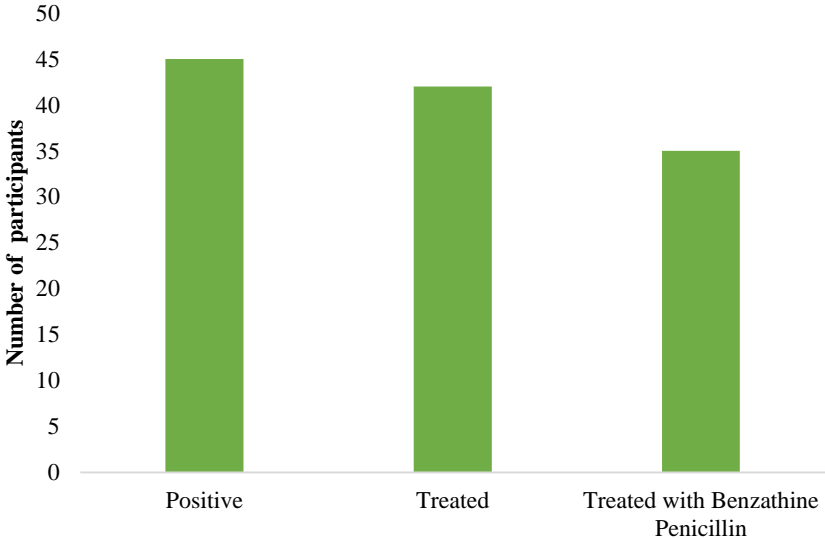


Figure 106: Syphilis treatment cascade among antenatal women, in the 2022 HIV Antenatal Survey, Mpumalanga

North West

Sample size realization and demographic characteristics

The sample size realization in North West was 84.3% (2 583). At district level, the total number of women enrolled (sample size achieved) ranged from 407 (15.6%) in Dr. Ruth district to 1 064 (40.6%) in Bojanala. Sample realization sample ranged from 71.0% in Dr. Ruth to 93.0% in Bojanala district. The majority of participants were aged 20-24 years (29.3%), and 25-29 years (25.2%) (Figure 79).

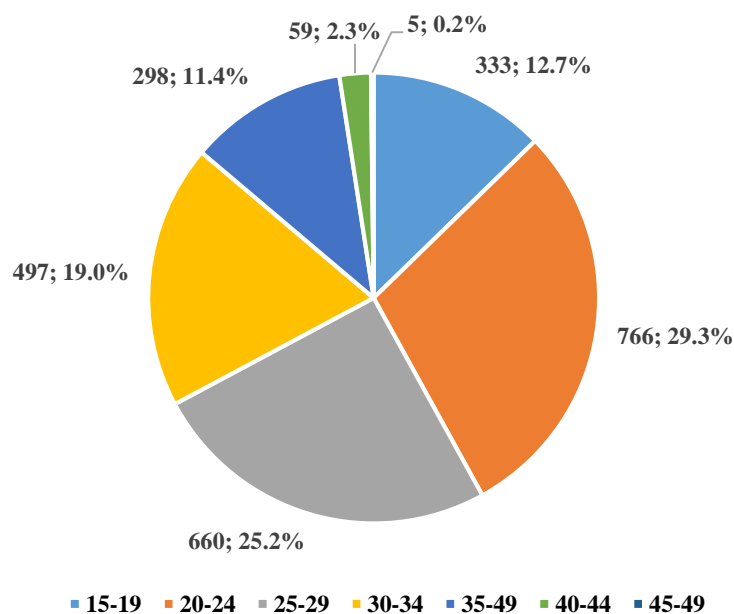
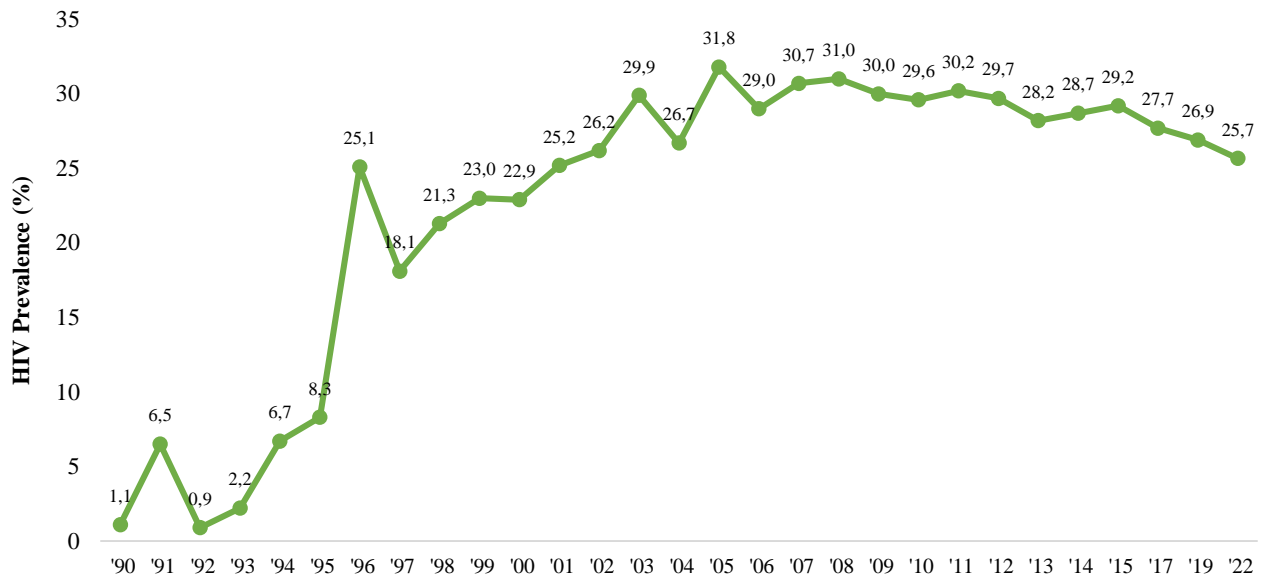


Figure 107: Distribution of survey participants by five-year age groups – North West, Antenatal HIV Sentinel Survey, 2022

HIV prevalence

The HIV prevalence in North West fluctuated between 2003 (29.9%) and 2015 (29.2%) (Figure 80). In 2022, the HIV prevalence declined to 25.7% (95% CI: 22.9 – 28.6%), which was 1.2% percentage points lower than the prevalence reported in 2019 (26.9%, 95% CI: 25.7 – 29.8%).

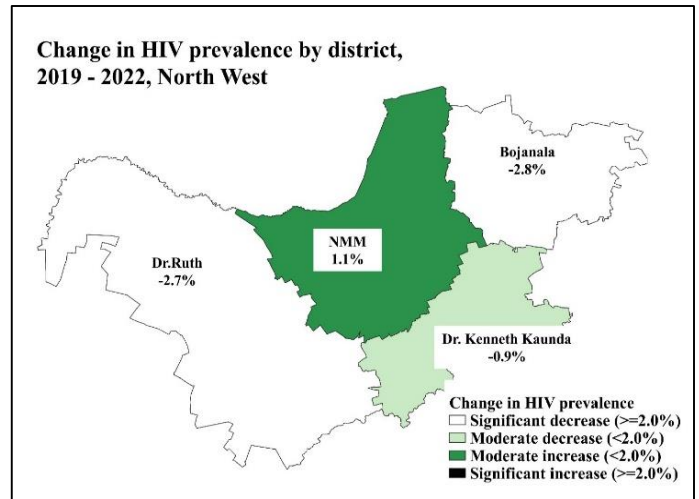
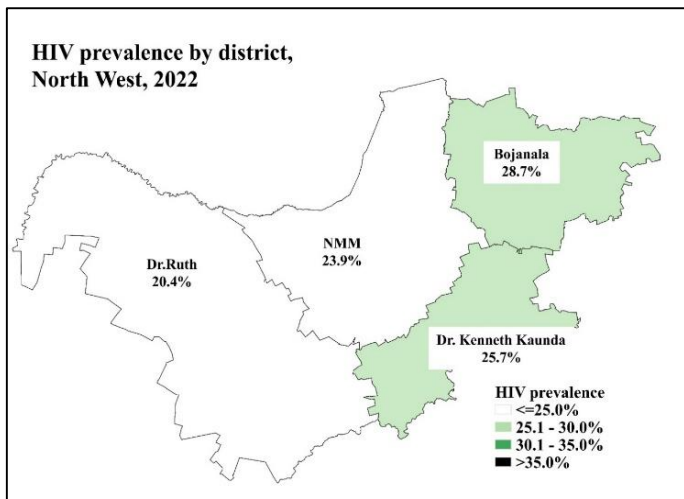
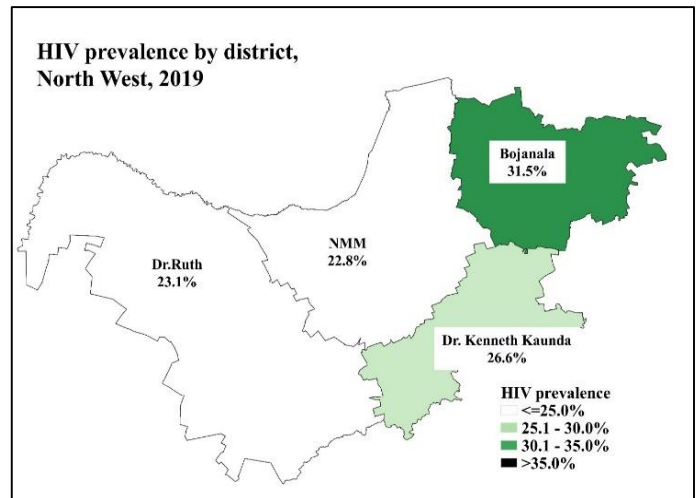
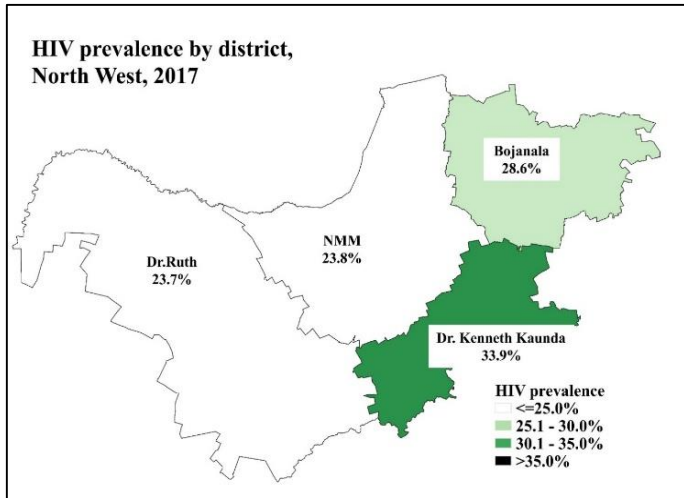


The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees

Figure 108: The HIV epidemic curve among antenatal women, North West, 1990 – 2022, Antenatal HIV Sentinel Survey

HIV prevalence by district

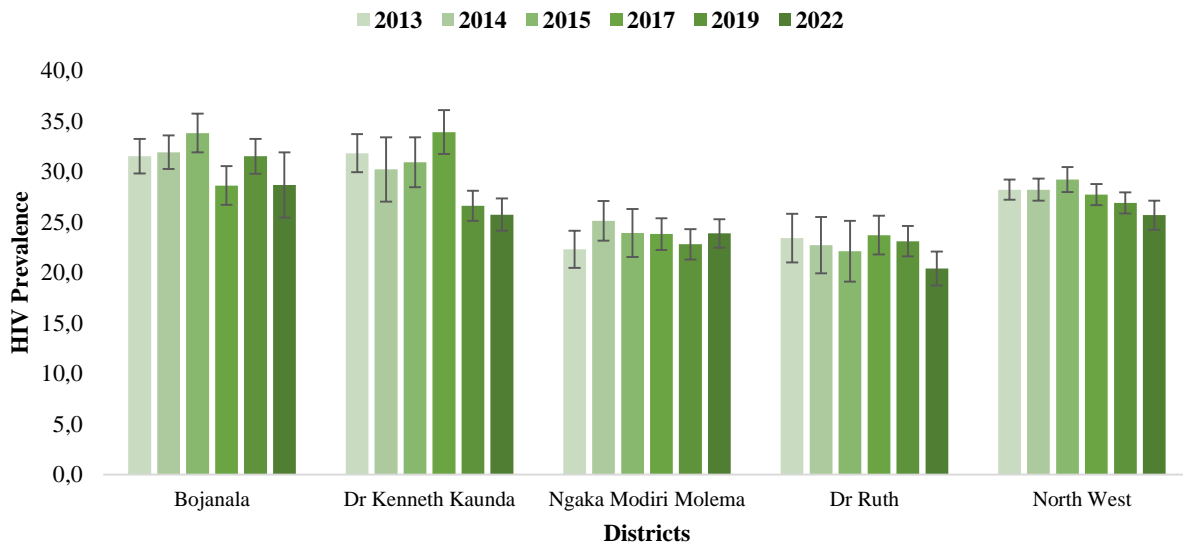
In North West, Bojanala District at 28.7%, (95% CI: 22.7 – 35.5%) had the highest HIV prevalence followed by Dr. Kenneth Kaunda (25.7%, 95% CI: 22.7 – 29.0%) (Figure 81). In this province, the district with the lowest HIV prevalence was Dr Ruth District at 20.4% (95% CI: 17.3 – 23.9%). Compared to the 2019 prevalence, the HIV prevalence decreased in 3 of the districts and increased from 22.8% (2019) to 23.9% (2022) in Ngaka Modiri Molema (NMM).



NMM: Ngaka Modiri Molema

Figure 109: Change in district HIV prevalence estimates – 2017 to 2022, Antenatal HIV Sentinel Survey, North West

Figure 82 and Table 7 shows the HIV prevalence trend for North West from 2013 to 2022. At district level, the HIV prevalence ranged from 20.4% in Dr Ruth district to 28.7% in Bojanala district. There appears to be an overall decline over the years in three of the districts, excluding the Ngaka Modiri Molema district.



The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees. The confidence intervals are wide due to small sample size at district level

Figure 110: HIV prevalence trend by district, 2013–2022, Antenatal HIV Sentinel Survey, North West

Table 7: HIV prevalence by district in the North West province, Antenatal HIV Sentinel Survey, 2013–2022

District	2013		2014		2015		2017		2019		2022	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Bojanala	31.5	28.3 - 35.0	31.9	28.8 - 35.3	33.8	30.1 - 37.6	28.6	25.0 - 32.5	31.5	28.2 - 35.0	28.7	22.7 - 35.5
Dr Kenneth Kaunda	31.8	28.2 - 35.6	30.2	24.3 - 36.8	30.9	26.2 - 35.9	33.9	29.7 - 38.2	26.6	23.8 - 29.6	25.7	22.7 - 29.0
Ngaka Modiri Molema	22.3	18.9 - 26.1	25.1	21.4 - 29.1	23.9	19.5 - 28.8	23.8	20.9 - 27.1	22.8	20.0 - 25.9	23.9	21.2 - 26.8
Dr Ruth	23.4	19.0 - 28.4	22.7	17.7 - 28.6	22.1	16.7 - 28.5	23.7	20.1 - 27.6	23.1	20.3 - 26.2	20.4	17.3 - 23.9
North West	28.2	26.3 - 30.2	28.2	26.6 - 30.9	29.2	26.8 - 31.6	27.7	25.7 - 29.8	26.9	25.7 - 29.8	25.7	22.9 - 28.6

The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees

PMTCT cascade – the first and second 95

Based on medical records review, 99.96%¹⁰ (2 505) of women attending ANC were offered HIV testing or already knew their HIV positive status. Most of the ANC attendees offered the test (2 481) accepted the offered test or already knew their HIV-positive status. From the 672 (25.67%) participants found to be HIV-positive by EIA test, 95.7% (643) already knew their HIV-positive status at the time of the survey (Figure 83). By district, Bojanala had the lowest knowledge of HIV status (95.1%) and Ngaka Modiri Molema (97.2%) had the highest knowledge of HIV status.

Among those who knew their HIV-positive status, excluding 5 (0.8%) participants whose treatment status was not reported, 99.4% (638) had initiated ART at the time of the survey. At a district level, among those who knew their status, ART initiation at the time of the survey ranged from 99.0% (Bojanala) to 100.0% in Ngaka Modiri Molema and Dr Ruth districts. Initiation of ART among those who knew their HIV status, increased between 2019 and 2022 in all districts in North West.

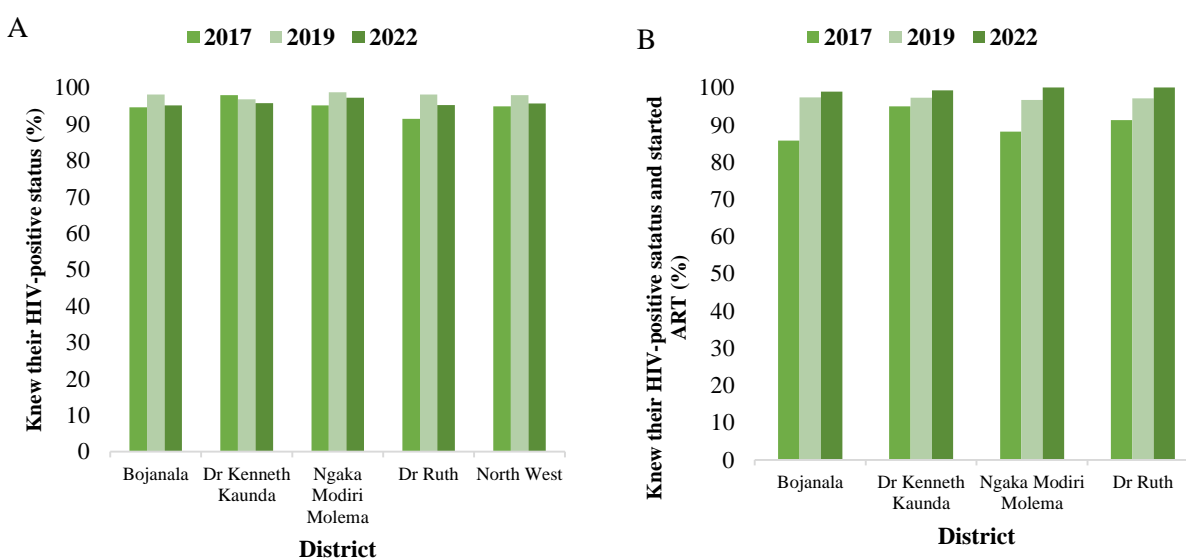


Figure 111: Knowledge of HIV-positive status and ART initiation at the time of the survey by district, in the 2017, 2019 and 2022 Antenatal HIV Sentinel Surveys, North West

Knowledge of HIV-positive status and ART initiation before pregnancy

In the North West, knowledge of HIV status before pregnancy was 79.7%, which was higher than the national average (78.1%). Among those who knew their HIV-positive status prior to pregnancy and had a reported treatment status (482), 88.9% (428) started ART before pregnancy (Figure 84).

¹⁰112 (4.3%) missing response excluded when calculating percentage

At district level, knowledge of HIV status before pregnancy ranged from 78.5% in Dr Ruth to 80.2% in Ngaka Modiri Molema in 2022. ART initiation before pregnancy was greater than 88.0% across all districts in North West. ART initiation before pregnancy was the lowest in Bojanala and Ngaka Modiri Molema (88.6%) and the highest in Dr Ruth (88.9%). In all districts, the percentage of women who knew their HIV positive status and initiated ART prior to pregnancy decreased in 2022 compared to 2019.

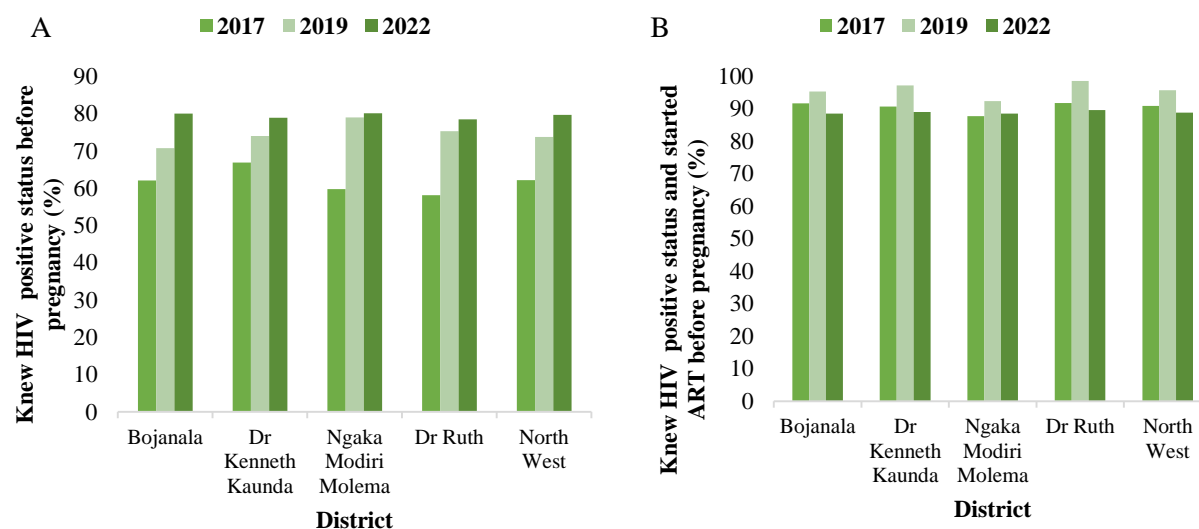


Figure 112: Knowledge of HIV-positive status and ART initiation before pregnancy by district, in the 2017, 2019 and 2022 Antenatal HIV Sentinel Surveys, North West

Viral Load Monitoring

In North West, viral load testing coverage was 87.6% (430 out of 491) and it was greater than 84.0% across all districts in the province (Figure 85). Among those who had a viral load test done and were due for a viral load test, 76.5% (329/430) had received their viral load results. Of those who had a viral load test done and received results, viral suppression (<50 copies/ml) was at 66.0%.

At a district level, Bojanala had the lowest viral load testing coverage (84.7%, 95% CI: 76.3 – 90.6) and highest viral load testing coverage was in Dr Kenneth Kaunda (91.3%). The Bojanala District had the lowest proportion of received viral load test results at 73.2% (95% CI: 65.7 – 79.6) and the highest proportion of received results was in Dr Ruth (82.1% (95% CI: 64.9 – 92.0)). Viral load suppression was the lowest in Ngaka Modiri Molema at 63.0% (95% CI: 52.8 – 72.2) and the highest was at 69.7% (95% CI: 53.7 – 80.2) in Dr Kenneth Kaunda.

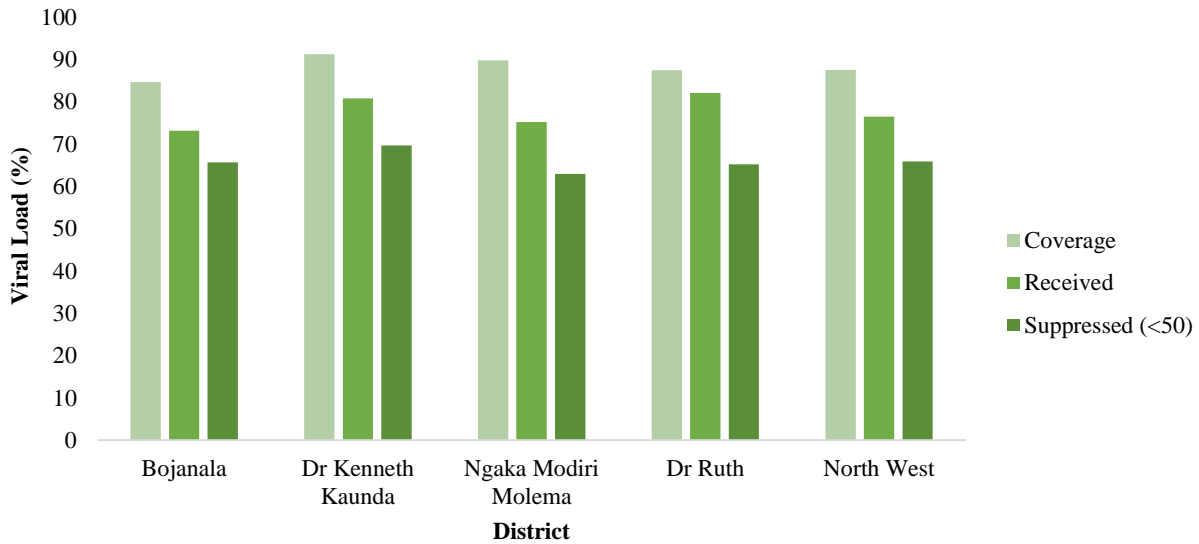


Figure 113: Viral load testing among antenatal women by district, in the 2022 HIV Antenatal Survey, North West

PrEP Coverage

In North West, 46.2% (713 out of 1 542 negative women) were PrEP eligible. Of those who were PrEP eligible and whose prior use of PrEP use was reported, prior use of PrEP was 1.7% (95% CI: 1.0 – 3.0) (Figure 86). At district level, Dr Ruth had the lowest reported prior use of PrEP at 1.4% (95% CI: 0.3 – 7.6). The highest reported prior PrEP use was in Ngaka Modiri Molema at 2.1% (95% CI: 0.8 – 5.1).

Among PrEP eligible women whose current use of PrEP was reported, 1.3% (95% CI: 0.7 – 2.6) were taking PrEP in the current pregnancy in North West. Ngaka Modiri Molema, Bojanala, and Dr Ruth districts were the only districts that reported having eligible women on PrEP during current pregnancy at 0.7% (95% CI: 0.1 – 3.5), 0.8% (95% CI: 0.2 – 2.6), and 4.2% (95% CI: 1.6 – 10.5%), respectively. The Dr Kenneth Kaunda district did not have women eligible women who reported taking PrEP in the current pregnancy.

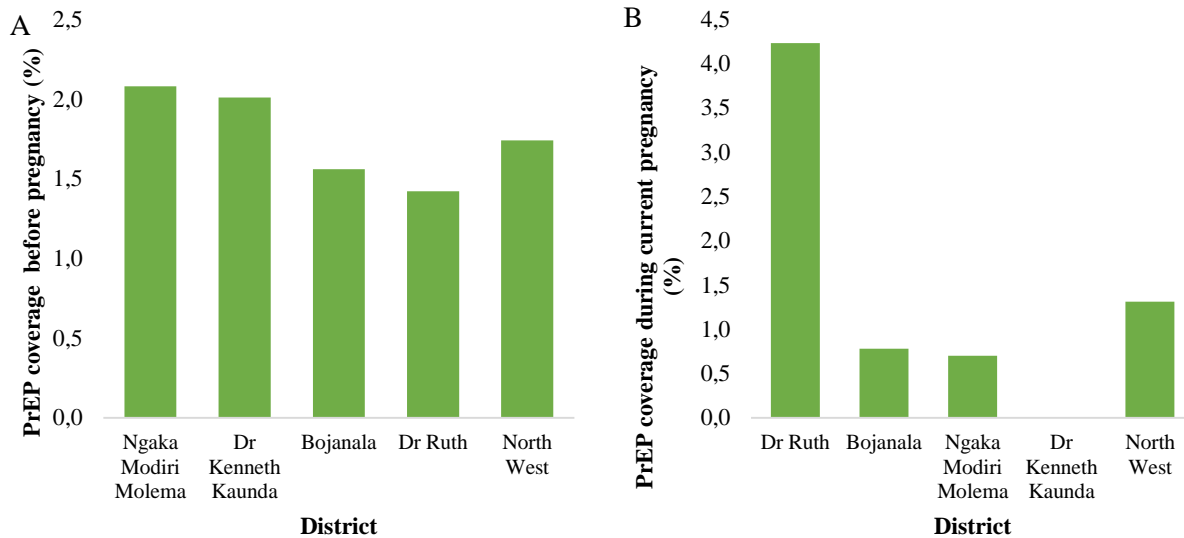


Figure 114: PrEP coverage before pregnancy (A) and during current pregnancy (B) by district, in the 2022 Antenatal HIV Sentinel Survey, North West

Early ANC attendance

In North West, 31.1% of the participants attended their first-ANC-visit before or at 12 weeks of pregnancy (Figure 87), while 65.2% attended their first-ANC-visit before 20 weeks of gestational age. At a district level, the lowest attendance of ANC before 20 weeks was in Bojanala (62.2%) and the highest was in Dr Kenneth Kaunda (70.1%). Attendance of ANC before 20 weeks was higher than the national average (61.0%). The attendance of ANC before 20 weeks was lower than the national average (61.0%) among women with high (≥ 4) gravidity (60.2%), single women (52.9%), those with no education at all (50.0%), those with primary education (58.9%), adolescent girls (55.6%) and those older than 40 years (58.9%).

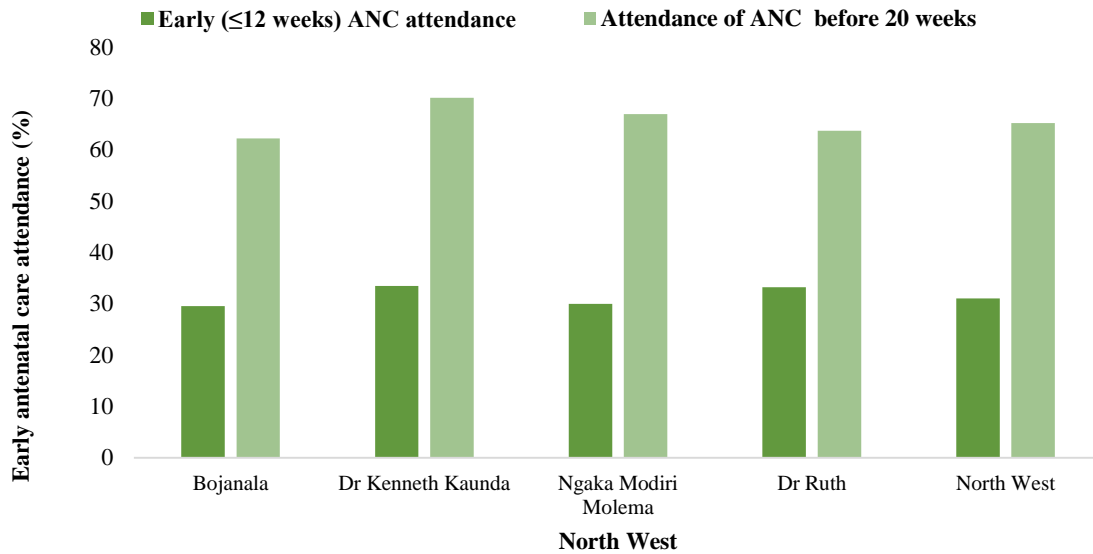
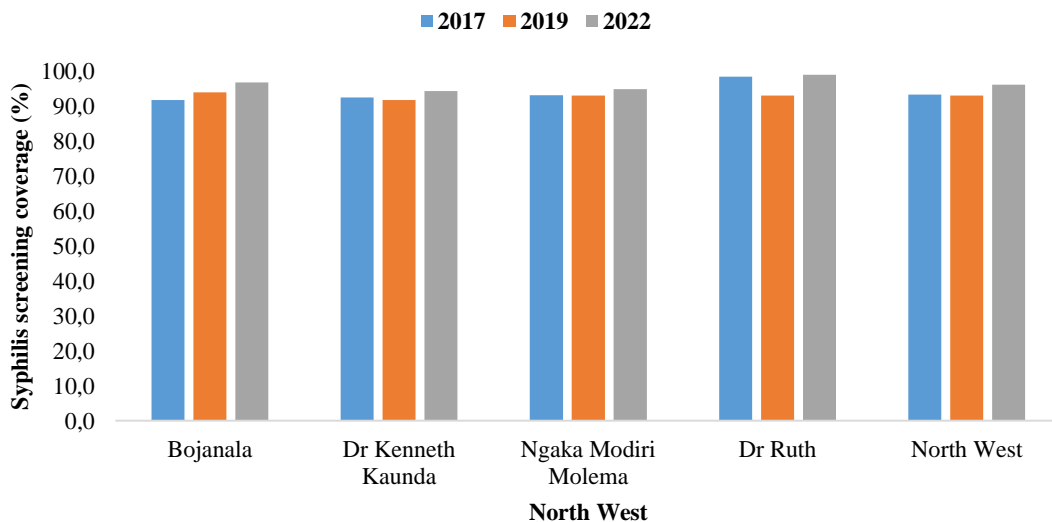


Figure 115: Early attendance of antenatal care by province in the 2022 Antenatal HIV Sentinel Survey, North West

Maternal syphilis screening and treatment coverage

For North West, maternal syphilis screening coverage was 96.2% (Figure 88). All districts in the province had syphilis screening coverage greater than 94.0%.

With respect to syphilis screening coverage, 3.0% (79) of the participants had missing data. If we assume that all missing responses indicate the participant did not receive the screening test, and include them as such in the denominator, coverage for syphilis screening in North West decreased from 96.2% to 93.3%.



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

Figure 116: Maternal syphilis screening coverage among antenatal women, in the 2017, 2019, 2022 Antenatal HIV Survey, North West

Of the women who had syphilis screening, 1.8% (41) were positive, 67.2% (1 570) were negative, 29.5% (689) had pending results, 1.5% (36) did not have results in file (Figure 89). Of those who had a test, a combined 31.0% had missing results (either due to pending in the laboratory or due to not being in patient file). The lowest percent of missing results was in Dr Ruth Segomotsi Mompati (23.5%) and the highest was in Bojanala (37.7%).

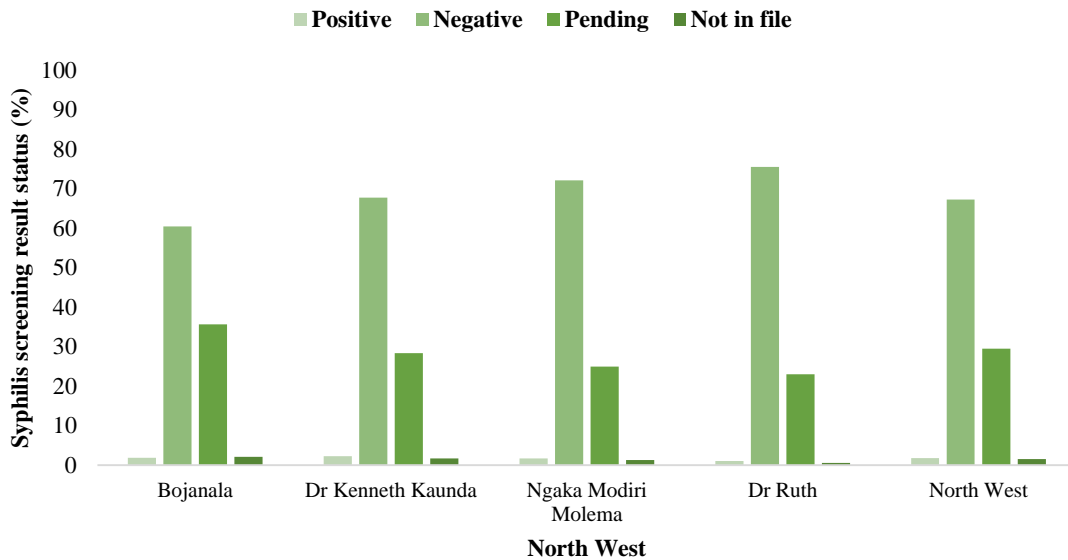
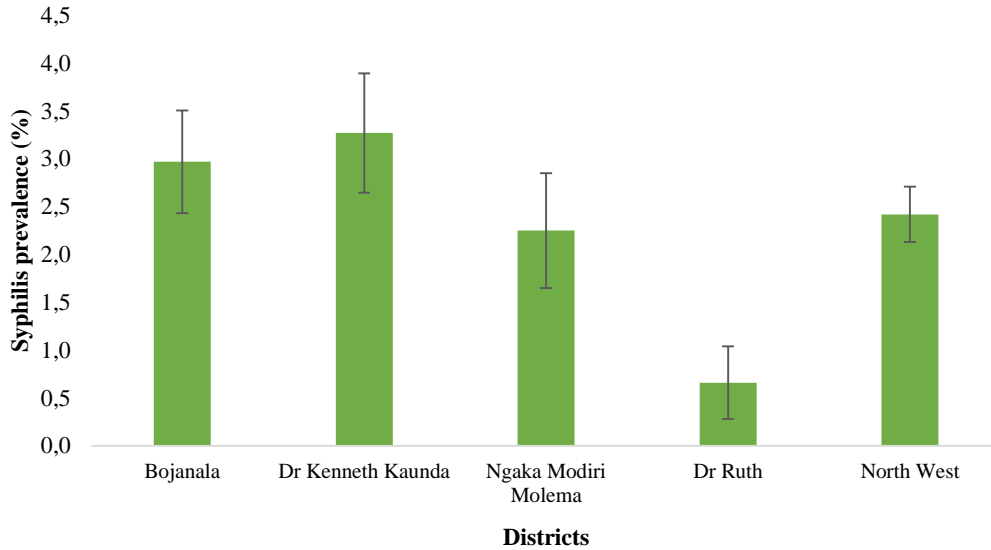


Figure 117: Maternal syphilis screening test result status by district, in the 2022 Antenatal HIV Sentinel Survey, North West

After the exclusion of the pending results and the results not in file, the prevalence of syphilis (per medical record review data) among those who had syphilis test result, was 2.42% (95% CI: 1.9 – 3.1%) overall (Figure 90). In Dr Kenneth Kaunda the prevalence of syphilis was highest at 3.3% (95% CI: 2.2 – 4.8) and the lowest was in Dr Ruth District at 0.7% (95% CI: 0.2 – 2.1).



The denominator syphilis prevalence was the number of women who received syphilis test results. Missing data excluded
Figure 118: Maternal syphilis prevalence among antenatal women, in the 2022 HIV Antenatal Survey, North West

Among those who were syphilis-positive and whose syphilis treatment status was reported (36), 97.2% (35) received treatment for syphilis. Of those treated for syphilis and had type of treatment data reported (35) 97.1% (34) were treated with at least one dose of BPG (Figure 91). If we assume that all missing responses mean that the subjects did not receive treatment for syphilis and include as such the missing data in the denominator, the coverage of syphilis treatment decreases from 97.2% to 85.4%.

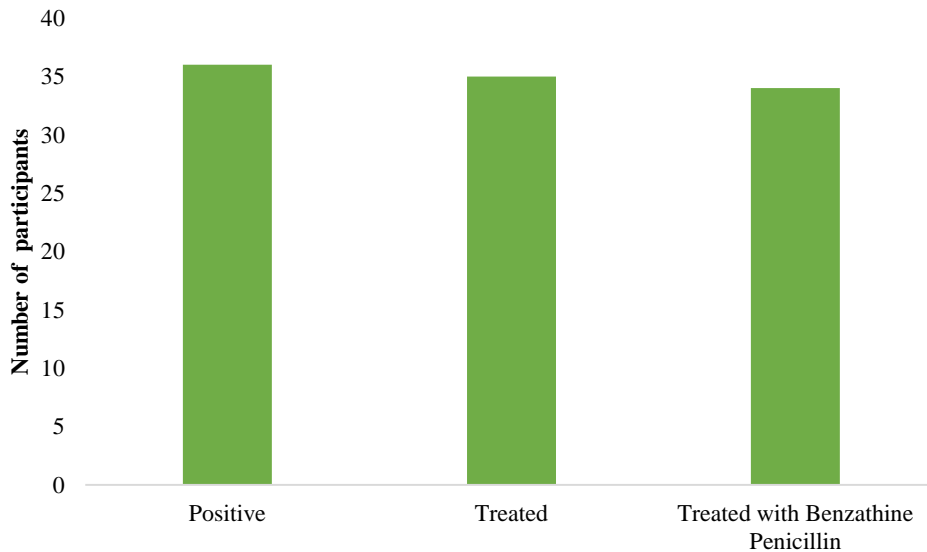


Figure 119: Syphilis treatment cascade among antenatal women, in the 2022 HIV Antenatal Survey, North West

Northern Cape

Sample size realization and demographic characteristics

The sample size realization in Northern Cape was 98.6% (1 642). At district level, the total number of women enrolled (sample size) ranged from 93 (5.7%) in Namakwa district to 434 (26.4%) in J.T Gaetsewe. Sample realization sample ranged from 94.1% in J.T Gaetsewe to 110.9% in Pixley Ka Seme district. The majority of participants were aged 20-24 years (27.7%), 25-29 years (25.9%) and 30-34 years (18.7%) (Figure 92).

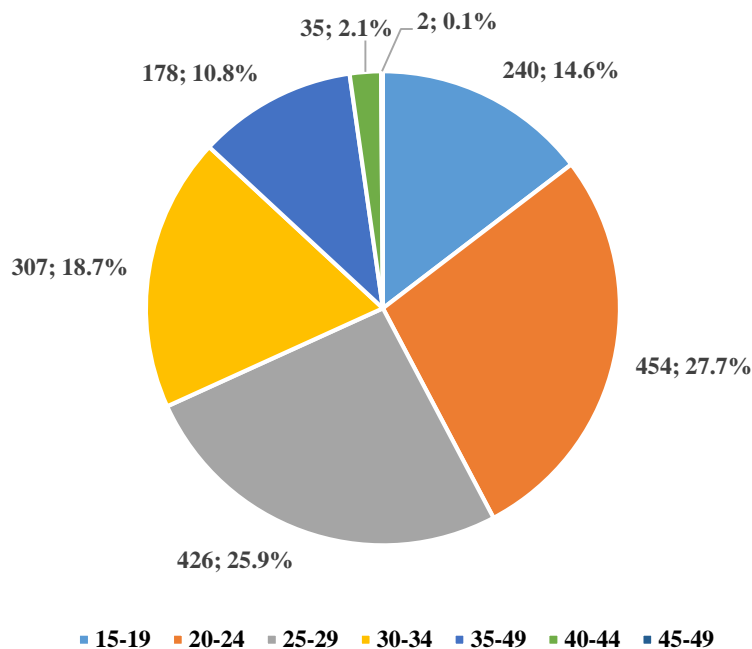
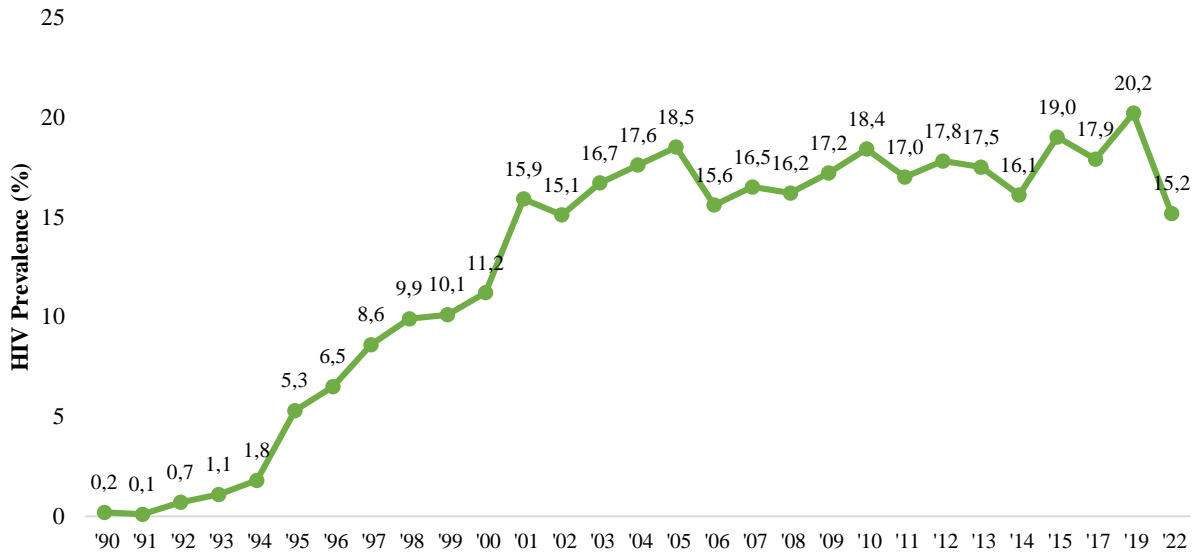


Figure 120: Distribution of survey participants by five-year age groups – Northern Cape, Antenatal HIV Sentinel Survey, 2022

HIV prevalence

The HIV prevalence in Northern Cape fluctuated between 18.5% in 2005 and 20.2% in 2019 (Figure 93). In 2022, the HIV prevalence declined to 15.2% (95% CI: 13.5 – 17.0), which was 5% percentage points lower than the prevalence reported in 2019 (20.1%, 95% CI: 18.2 –22.2%).



The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees

Figure 121: The HIV epidemic curve among antenatal women, Northern Cape, 1990 – 2022, Antenatal HIV Sentinel Survey

HIV prevalence by district

In Northern Cape, J.T Gaetsewe District 16.8%, (95% CI: 13.4 – 20.9) had the highest HIV prevalence followed by Pixley Ka Seme (16.0%, 95% CI: 12.0 – 20.9) (Figure 94). In this province, the district with the lowest HIV prevalence was Namakwa District at 5.4% (95% CI: 2.7 – 10.6). Overall, compared to the 2019 prevalence, the HIV prevalence decreased in all districts with all districts with the exception of one district (Pixley Ka Seme) recording decreases larger than the national average.

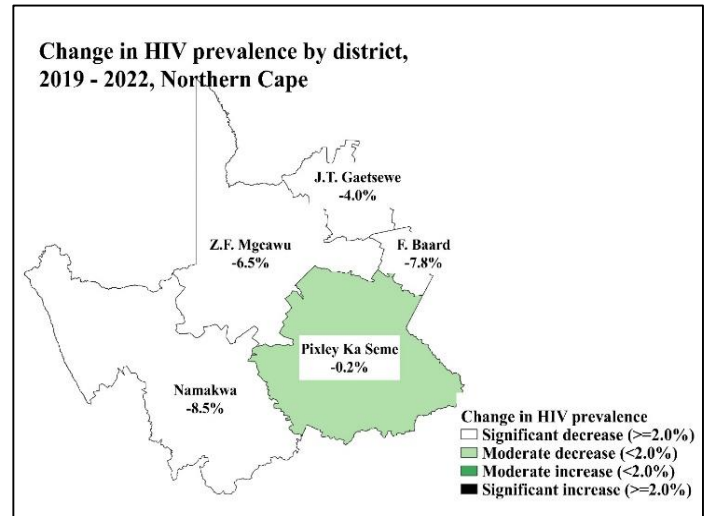
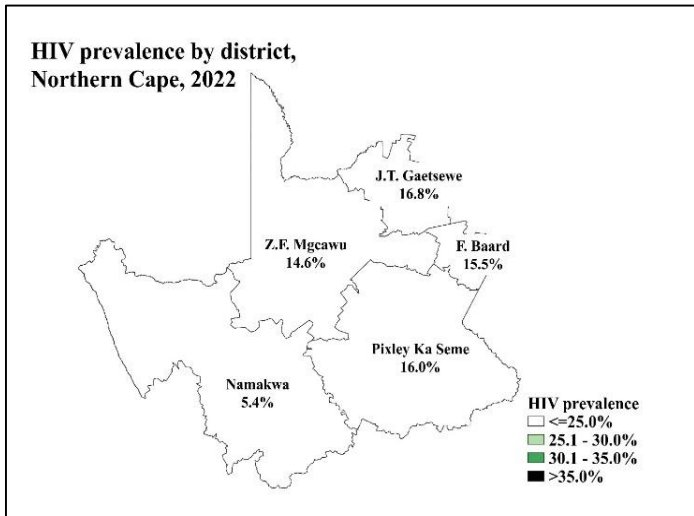
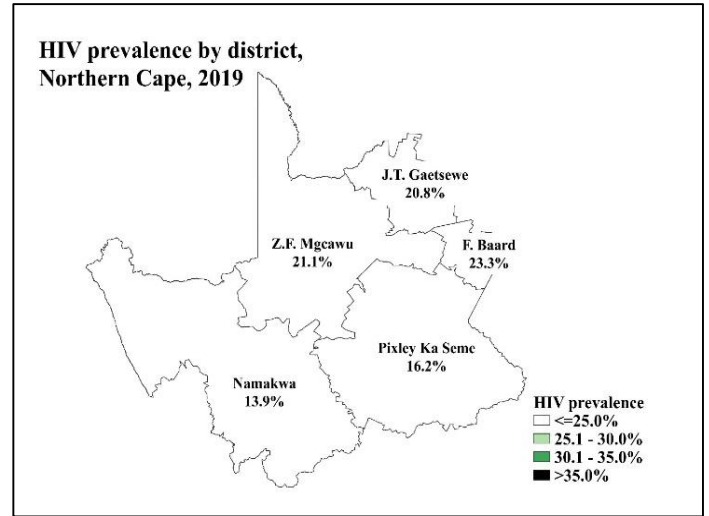
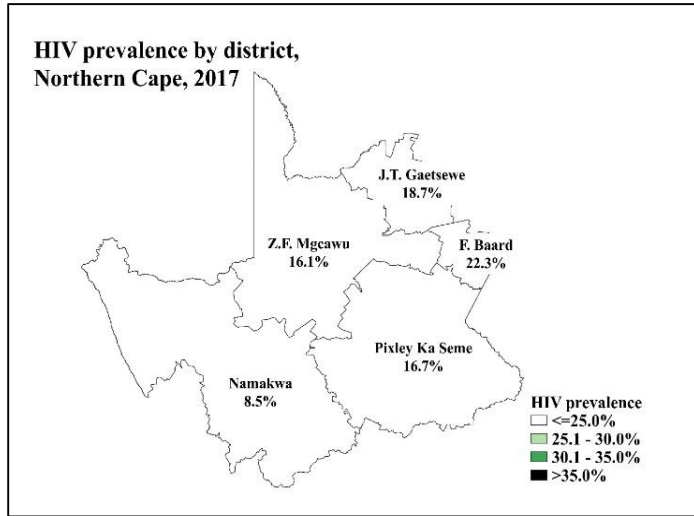
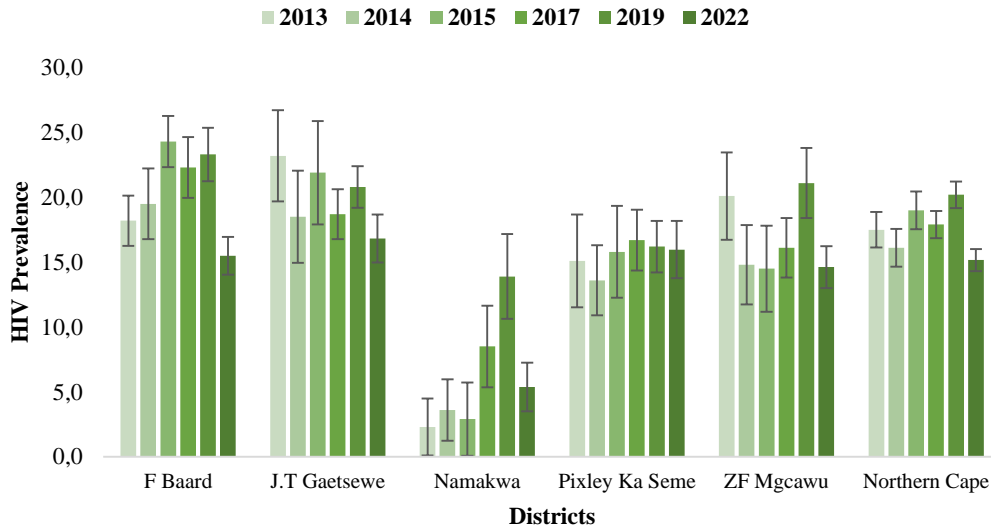


Figure 122: Change in district HIV prevalence estimates, 2017 to 2022, Antenatal HIV Sentinel Survey, Northern Cape

Figure 95 and Table 8 shows the HIV prevalence trend for Northern Cape from 2013 to 2022. At district level, the highest HIV prevalence was in J.T. Gaetsewe (16.8%) and the lowest HIV prevalence was in Namakwa (5.4%). Overall, the HIV prevalence appears to have fluctuated over the years.



The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees. The confidence intervals are wide due to small sample size at district level

Figure 123: HIV prevalence trend by district, 2013–2022, Antenatal HIV Sentinel Survey, Northern Cape

Table 8: HIV prevalence by district in the Northern Cape, Antenatal HIV Sentinel Survey, 2013–2022

District	2013		2014		2015		2017		2019		2022	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
F Baard	18.2	14.7 - 22.3	19.5	14.9 - 25.6	24.3	20.6 - 28.3	22.3	18.0 - 27.2	23.3	19.5 - 27.6	15.5	12.8 - 18.6
J.T Gaetsewe	23.2	17.0 - 30.8	18.5	12.5 - 26.4	21.9	15.1 - 30.7	18.7	15.3 - 22.8	20.8	17.8 - 24.1	16.8	13.4 - 20.9
Namakwa	2.3	0.5 - 9.1	3.6	1.2 - 10.5	2.9	0.7 - 11.8	8.5	4.2 - 16.5	13.9	8.7 - 21.5	5.4	2.7 - 10.6
Pixley Ka Seme	15.1	9.4 - 23.4	13.6	9.1 - 19.7	15.8	10.0 - 23.9	16.7	12.6 - 21.8	16.2	12.7 - 20.5	16.0	12.0 - 20.9
ZF Mgcawu	20.1	14.3 - 27.5	14.8	9.8 - 21.8	14.5	9.2 - 22.2	16.1	12.1 - 21.1	21.1	16.3 - 26.9	14.6	11.7 - 18.1
Northern Cape	17.5	15.0 - 20.4	16.1	13.5 - 19.2	19.0	16.3 - 22.0	17.9	16.0 - 20.1	20.2	18.2 - 22.2	15.2	13.5 - 17.0

The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees

PMTCT cascade – the first and second 95

Based on medical records review, 99.9%¹¹ (1 525) of women attending ANC were offered HIV testing or already knew their HIV positive status. Most of the ANC attendees offered the test accepted the offered test or already knew their HIV-positive status (99.9%, 1 516). From the 249 (15.2%) participants found to be HIV-positive by EIA test, 94.0% (234) already knew their HIV-positive status at the time of the survey (Figure 96). By district, ZF Mgcawu, Francis Beard and J.T Gaetsewe districts had the lowest knowledge of HIV status (91.2%, 93.0% and 93.2, respectively) while Namakwa and Pixley Ka Seme had the highest knowledge of HIV status at 98.3% and 100.0%, respectively.

Among those who knew their HIV-positive status, excluding 5 (2.1%) participants whose treatment status was not reported, 98.3% (229) had initiated ART at the time of the survey. At a district level, among those who knew their status, ART initiation ranged from 96.2% (Francis Beard) to 100.0% in Namakwa and ZF Mgcawu districts. Initiation of ART increased between 2019 and 2022 in all districts in the province.

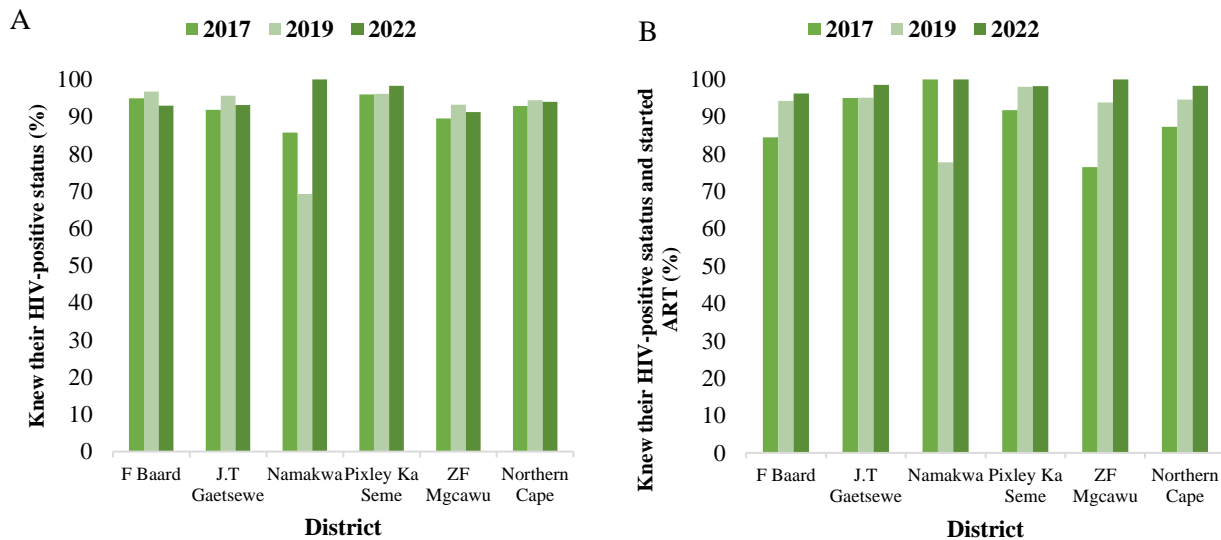


Figure 124: Knowledge of HIV-positive status and ART initiation at the time of the survey by district, in the 2017, 2019 and 2022 Antenatal HIV Sentinel Surveys, Northern Cape

Knowledge of HIV-positive status and ART initiation before pregnancy

In the Northern Cape, knowledge of HIV status before pregnancy was 76.6%, which was lower than the national average (78.1%). Among those who knew their HIV-positive status prior to pregnancy and had a reported treatment status (171), 86.6% (148) started ART before pregnancy (Figure 97).

At district level, knowledge of HIV status before pregnancy ranged was 69.7% in J.T Gaetsewe, 73.6% in Francis Beard, 78.4% in ZF Mgcawu, 83.9% in Pixley Ka Seme and 100.0% in Namakwa districts in 2022. Francis Beard and Pixley Ka Seme districts had the lowest ART initiation before pregnancy at 79.0% and 80.4%, respectively, while Namakwa District had the

¹¹115 (7%) missing response excluded when calculating percentage

highest ART initiation before pregnancy at 100.0%. In all districts, the percentage of women who knew their HIV-positive status and initiated ART prior to pregnancy either decreased or remained the same in 2022 compared to 2019 except in Francis Baard where it decreased.

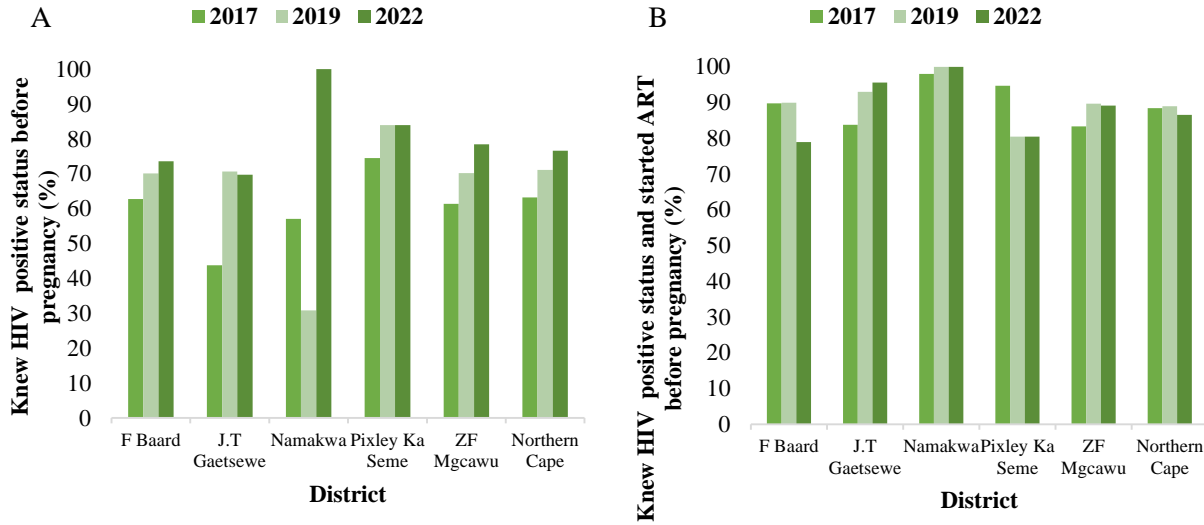


Figure 125: Knowledge of HIV-positive status and ART initiation before pregnancy by district, in the 2017, 2019 and 2022 Antenatal HIV Sentinel Surveys, Northern Cape

Viral Load Monitoring

In Northern Cape, viral load testing coverage was 93.1% (161 out of 173) and it was greater than 90.0% across all districts in the province (Figure 98). Among those who had a viral load test done and were due for a viral load test, 83.2% (134) had received their viral load results. Of those who had a viral load test done and received results, viral suppression (<50 copies/ml) was at 53.7%.

At a district level, ZF Mgcawu had the lowest viral load testing coverage (91.4%, 95% CI: 82.4 – 96.1%) and highest viral load testing coverage was in Namakwa (100%). In Bojanala District, however, only 60.0% (95% CI: 22.7 – 88.4) had received viral load test results as opposed to 90.2% (95% CI: 81.0 – 95.2) who had received results in Pixley Ka Seme. Viral load suppression was the lowest in Pixley Ka Seme at 32.4% (95% CI: 21.7 – 45.4) and the highest was at 69.7% (95% CI: 56.1 – 78.4) in J.T Gaetsewe.

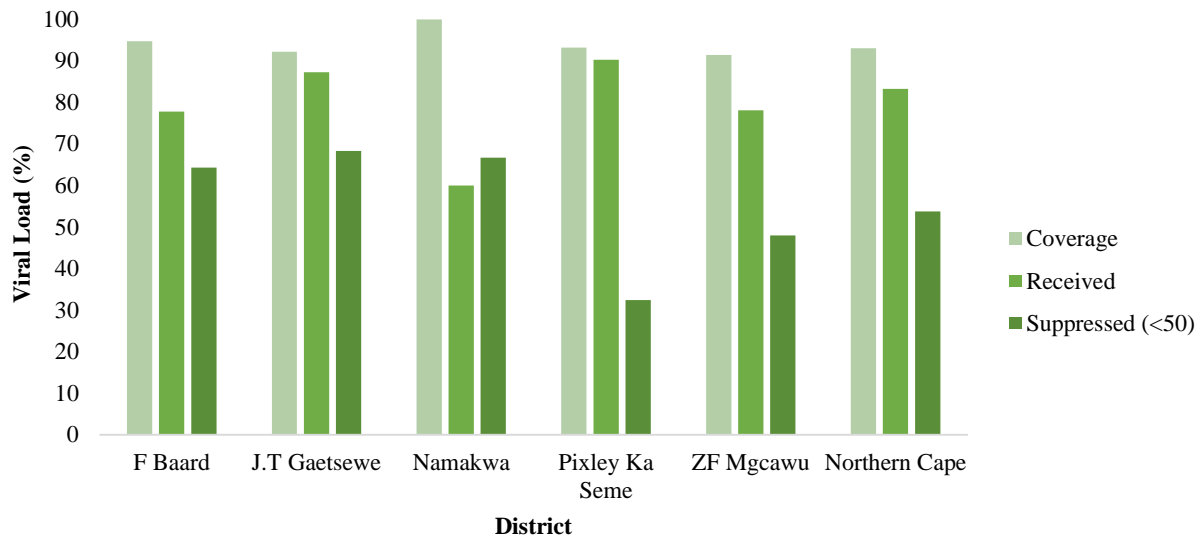


Figure 126: Viral load testing among antenatal women by district, in the 2022 HIV Antenatal Survey, Northern Cape

PrEP Coverage

In Northern Cape, 46.2% (551 out of 713 negative women) were PrEP eligible. This proportion of PrEP eligibility among HIV negative women was generally high compared to other provinces. Of those who were PrEP eligible and whose prior use of PrEP use was reported, prior use of PrEP was 0.2% (95% CI: 0.0 – 0.9) (Figure 99). Only one district, ZF Mgcawu had HIV negative, eligible women who reported prior use of PrEP at 0.9% (0.2 – 4.4%). In the remaining four districts, there were no PrEP eligible pregnant women who reported using PrEP prior to pregnancy. Among PrEP eligible women whose current use of PrEP was reported, 0.4% (95% CI: 0.1 – 1.1%) were taking PrEP in the current pregnancy. Francis Baard and Pixley Ka Seme districts were the only districts that reported having eligible women on PrEP during current pregnancy at 1.0% (95% CI: 0.2 – 4.0) and 0.7% (95% CI: 0.2 – 3.1), respectively. The remainder of districts did not have women eligible women who reported taking PrEP in the current pregnancy.

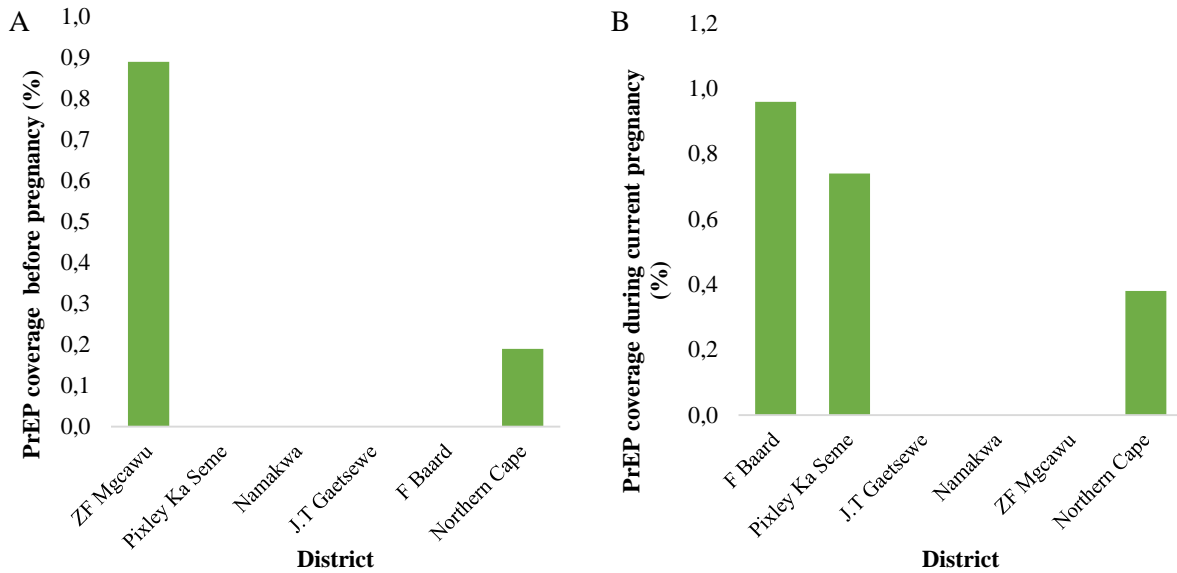


Figure 127: PrEP coverage before pregnancy (A) and during current pregnancy (B) by district, in the 2022 Antenatal HIV Sentinel Survey, Northern Cape

Early ANC attendance

In Northern Cape, 27.3% of the participants attended their first-ANC-visit before or at 12 weeks of pregnancy (Figure 100), while 59.8% attended their first-ANC-visit before 20 weeks of gestational age. At a district level, the lowest attendance of ANC before 20 weeks was in J.T. Gaetsewe (53.3%) and the highest was in Namakwa (70.9%). Attendance of ANC before 20 weeks was lower than the national average (61.0%) overall and even lower among women with high (≥ 4) gravidity (45.8%), those with only a primary education (57.7%), adolescent girls (49.5%) and those older than 40 years (45.5%). Single women (66.7%) and those with no education at all (100.0%) had ANC attendance before 20 weeks that was higher than both the provincial and national averages.

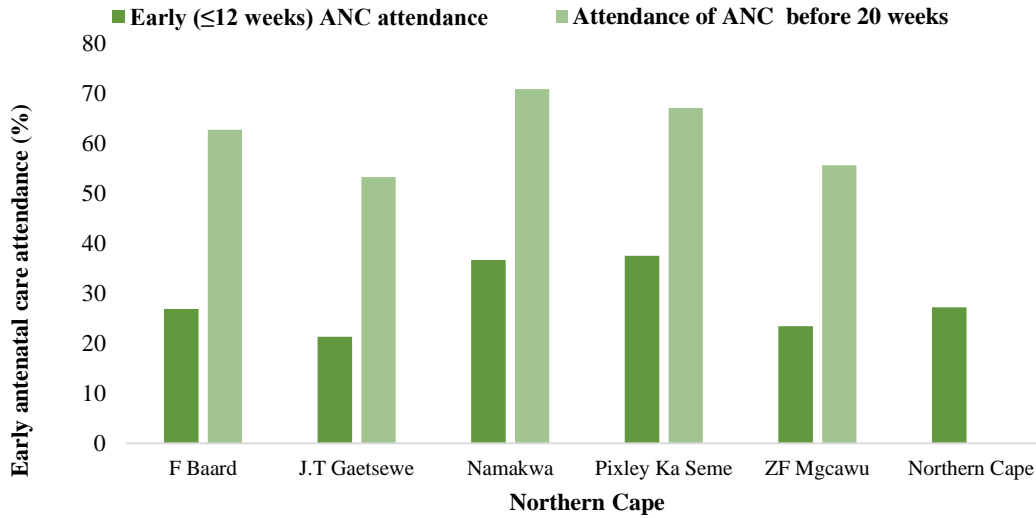
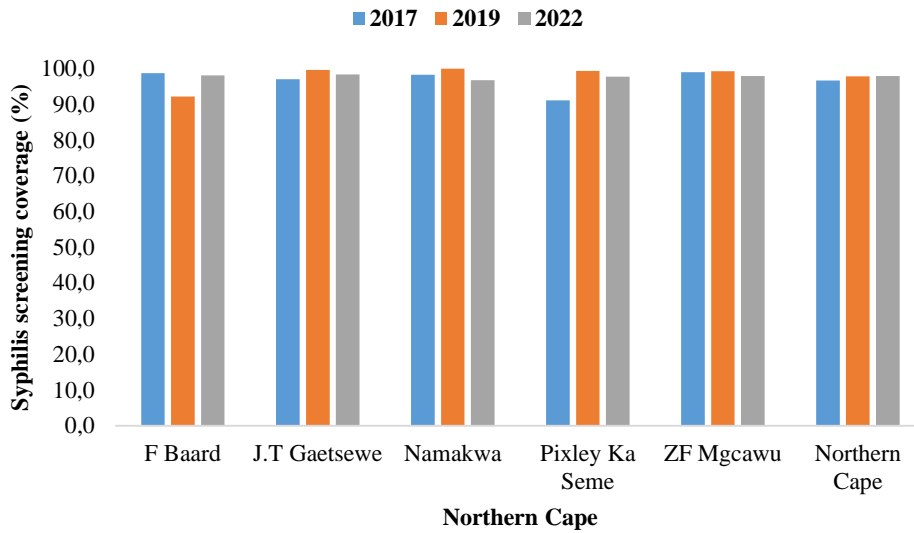


Figure 128: Early attendance of antenatal care by province in the 2022 Antenatal HIV Sentinel Survey, Northern Cape

Maternal syphilis screening and treatment coverage

For Northern Cape, maternal syphilis screening coverage was 98.0%, which was similar to the estimate from 2019 (97.8%) (Figure 101). All districts in the province had syphilis screening coverage greater than 96.0%.

With respect to syphilis screening coverage 1.2% (19) of the participants had missing data. If we assume that all missing responses indicate the participant did not receive the screening test, and include them as such in the denominator, coverage for syphilis screening in Northern Cape decreased from 98.0% to 96.8%.



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

Figure 129: Maternal syphilis screening coverage among antenatal women, in the 2017, 2019, 2022 Antenatal HIV Survey, Northern Cape

Of the women who had syphilis screening, 2.4% (37) were positive, 74.2% (1 138) were negative, 23.1% (355) had pending results, 0.3% (4) did not have results in file (Figure 102). Of those who had a test, a combined 23.4% had missing results (either due to pending in the laboratory or due to not being in patient file). The lowest percent of missing results was in ZF Mgcawu (16.2%) and the highest was in J.T Gaetsewe (38.8%).

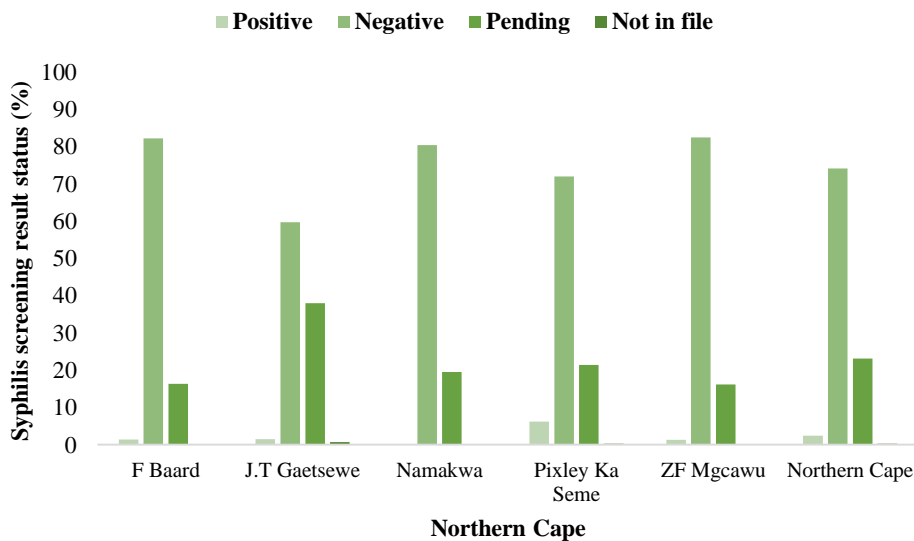
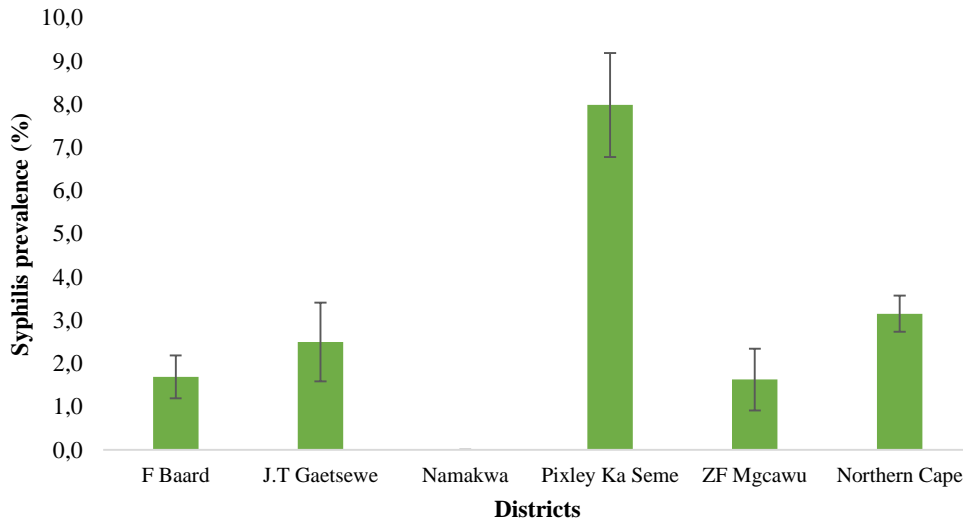


Figure 130: Maternal syphilis screening test result status by district, in the 2022 Antenatal HIV Sentinel Survey, Northern Cape

Once the pending results and the results not in file were excluded, the prevalence of syphilis (per medical record review data) among those who had syphilis test result, was 3.2% (95% CI: 2.4 -

4.1%) overall (Figure 103). In Pixley Ka Seme, the prevalence of syphilis was highest at 8.0% (95% CI: 5.9 – 10.7) and the lowest was in ZF Mgcawu District at 1.6% (95% CI: 0.7 – 3.9). Namakwa district did not have women who were positive for syphilis by record review.



The denominator syphilis prevalence was the number of women who received syphilis test results. Missing data excluded
Figure 131: Maternal syphilis prevalence among antenatal women, in the 2022 HIV Antenatal Survey, Northern Cape

Among those who were syphilis-positive and whose syphilis treatment status was reported (34), 82.4% (28) received treatment for syphilis. Of those treated for syphilis and had type of treatment data reported (28), 89.3% (25) were treated with at least one dose of BPG (Figure 104). If we assume that all missing responses mean that the subjects did not receive treatment for syphilis and include as such the missing data in the denominator, the coverage of syphilis treatment decreases from 82.4% to 75.7%.

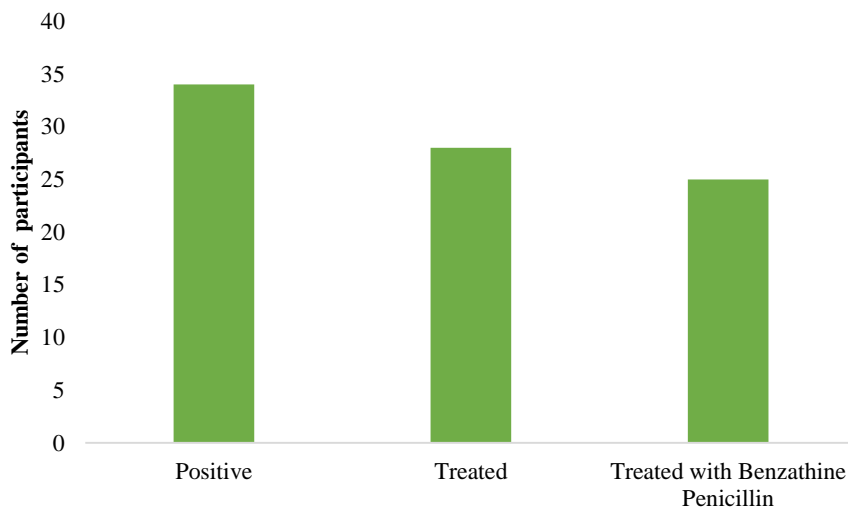


Figure 132: Syphilis treatment cascade among antenatal women, in the 2022 HIV Antenatal Survey, Northern Cape

Western Cape

Sample size realization and demographic characteristics

The sample size realization in Western Cape was 110.7% (4 027). At district level, the number of women enrolled (sample size) ranged from 171 (4.2% of provincial total) in Central Karoo district to 1 089 (26.90%) in Cape Town district. Sample size realization ranged from 97.0% in Cape Winelands to 129.0% in Eden district. The majority of participants were aged 20-24 years (28.8%), 25-29 years (28.0%) and 30-34 years (18.6%) (Figure 105).

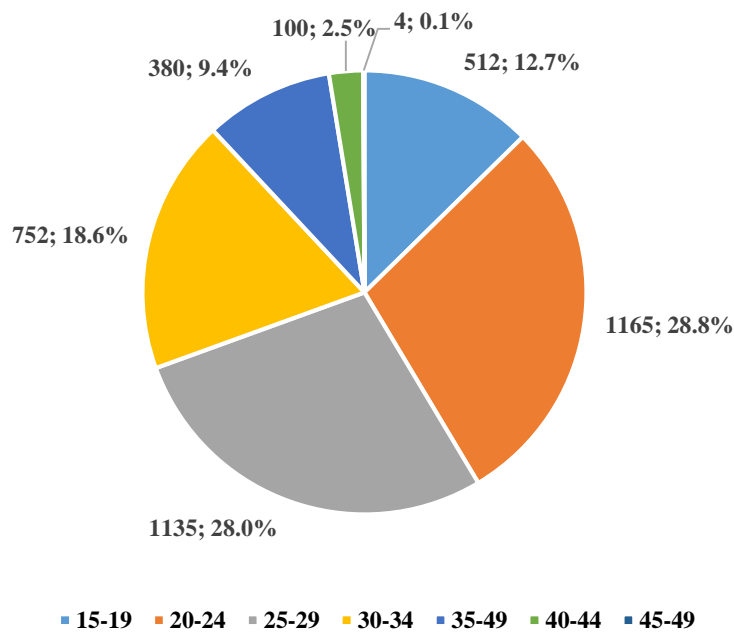
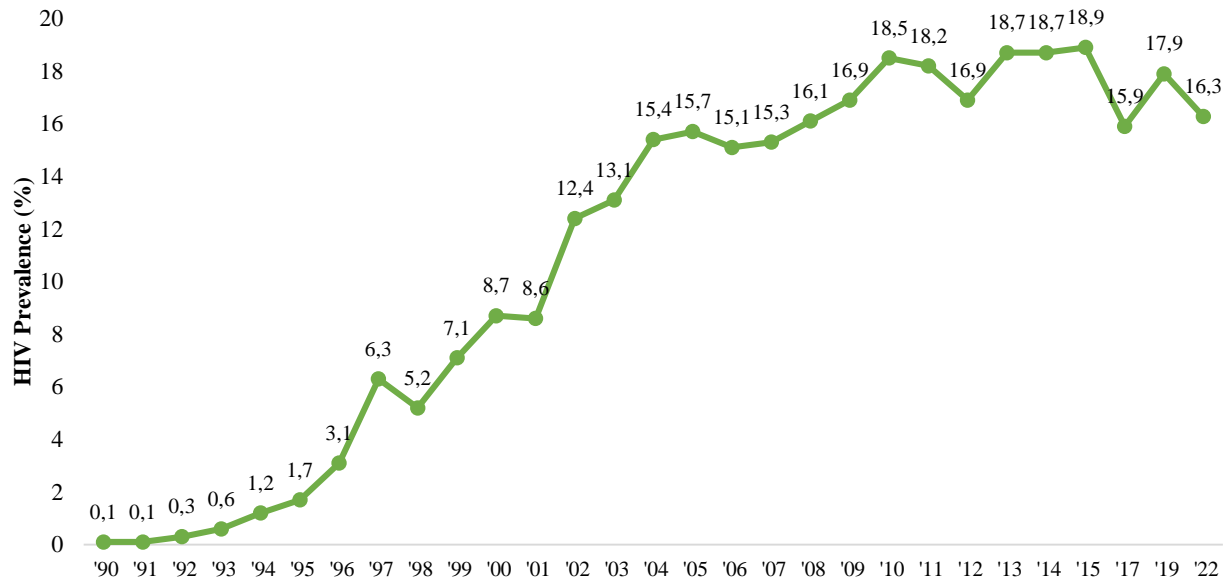


Figure 133: Distribution of survey participants by five-year age groups – Western Cape, Antenatal HIV Sentinel Survey, 2022

HIV prevalence

The HIV prevalence in Western Cape increased over time and fluctuated in 2010 and 2019 between 18.5% and 17.9%, respectively (Figure 106). In 2022, the HIV prevalence declined to 16.3% (95% CI: 15.0 – 17.7), which was 1.6% percentage points lower than the prevalence reported in 2019 (17.9%, 95% CI: 16.2 – 19.7).



The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees

Figure 134: The HIV epidemic curve among antenatal women, Western Cape, 1990 – 2022, Antenatal HIV Sentinel Survey

HIV prevalence by district

In Western Cape, the highest HIV prevalence was 20.3% in Cape Town (95% CI: 18.2 – 22.6) and Overberg (95% CI: 13.9 – 28.6%) (Figure 107). The lowest HIV prevalence in Western Cape was in the Central Karoo district at 8.2% (95% CI: 5.5 – 12.1). Overall, the HIV prevalence in 2022 decreased in all districts except in two districts (Cape Winelands and Central Karoo) compared to the 2019 prevalence.

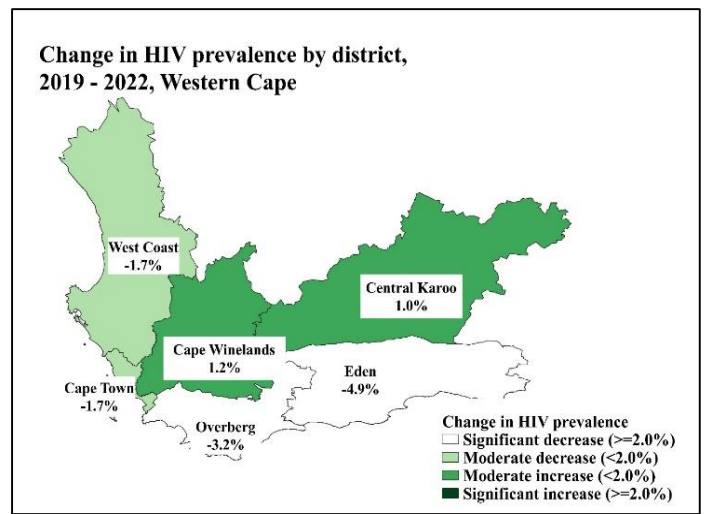
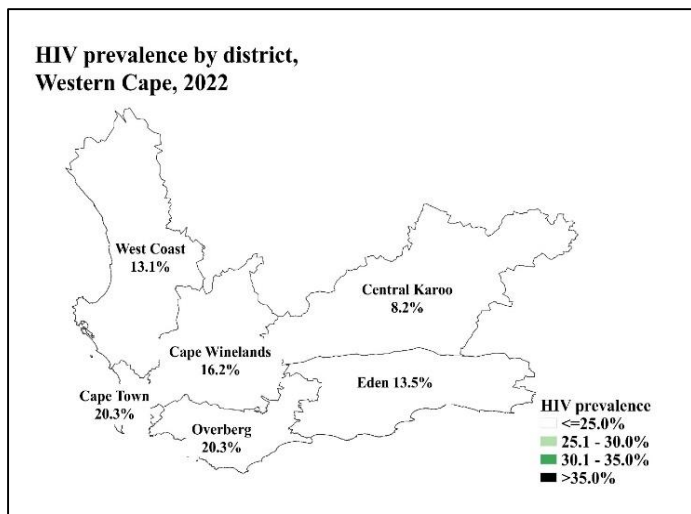
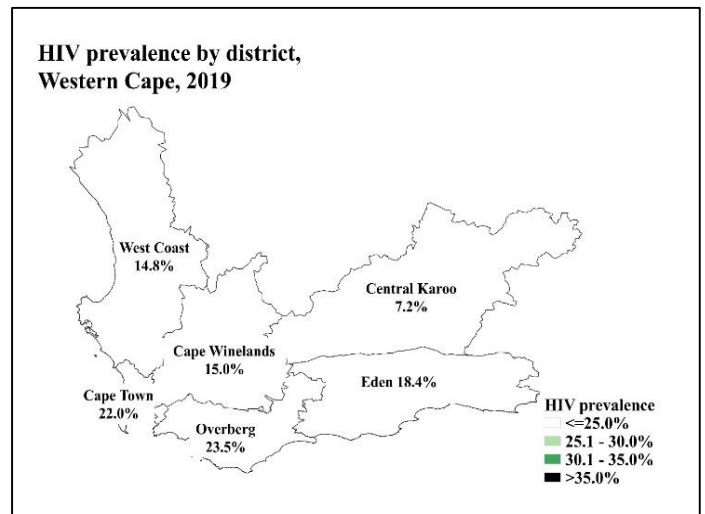
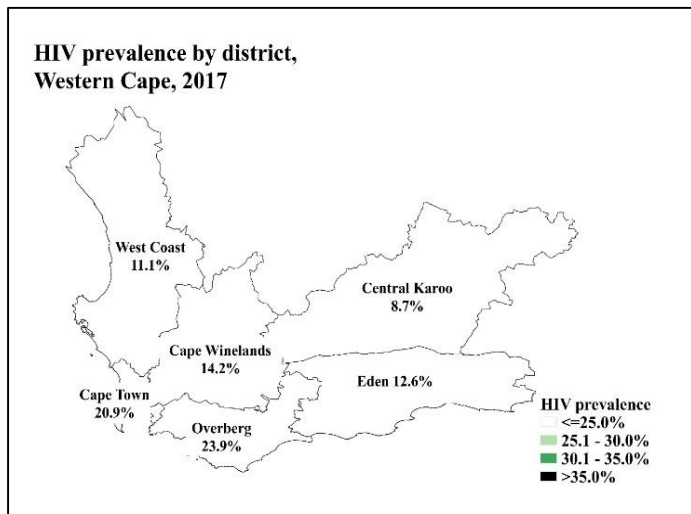
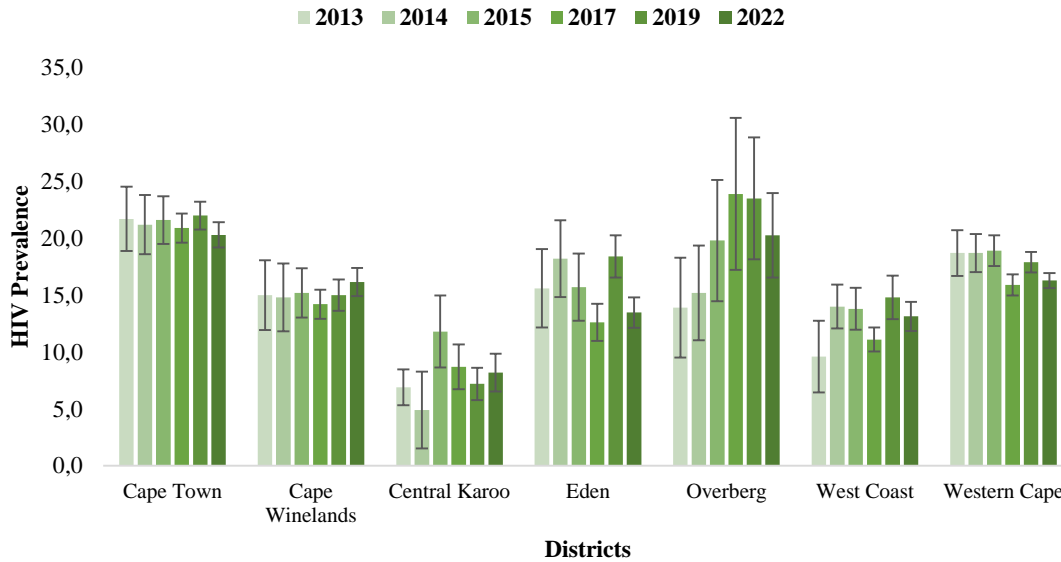


Figure 135: Change in district HIV prevalence estimates, 2017 to 2022, Antenatal HIV Sentinel Survey, Western Cape

The HIV prevalence trend from 2013 to 2022 for Western Cape is shown in Figure 108 and Table 9. At district level, the lowest HIV prevalence was in the Central Karoo district (8.2%) and the highest HIV prevalence was in Cape Town and Overberg both at 20.3%. Overall, the HIV prevalence decreased from 2013 (18.7%) to 2022 (13.1%).



The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees. The confidence intervals are wide due to small sample size at district level

Figure 136: HIV prevalence trend by district, 2013–2022, Antenatal HIV Sentinel Survey, Western Cape

Table 9: HIV prevalence by district in the Western Cape province, Antenatal HIV Sentinel Survey, 2013 to 2022

District	2013		2014		2015		2017		2019		2022	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Cape Town	21.7	16.6 - 27.7	21.2	16.6 - 26.8	21.6	17.8 - 26.0	20.9	18.5 - 23.5	22.0	19.7 - 24.5	20.3	18.2 - 22.6
Cape Winelands	15.0	10.0 - 22.0	14.8	9.9 - 21.6	15.2	11.4 - 19.9	14.2	11.9 - 16.9	15.0	12.5 - 17.9	16.2	13.8 - 18.8
Central Karoo	6.9	4.4 - 10.6	4.9	1.5 - 14.7	11.8	6.9 - 19.3	8.7	5.6 - 13.3	7.2	4.9 - 10.5	8.2	5.5 - 12.1
Eden	15.6	10.0 - 23.5	18.2	12.4 - 25.6	15.7	10.8 - 22.4	12.6	9.7 - 16.1	18.4	15.1 - 22.4	13.5	11.0 - 16.3
Overberg	13.9	7.4 - 24.6	15.2	8.8 - 25.1	19.8	11.4 - 32.3	23.9	13.2 - 39.4	23.5	14.6 - 35.6	20.3	13.9 - 28.6
West Coast	9.6	5.0 - 17.3	14.0	10.6 - 18.2	13.8	10.6 - 17.8	11.1	9.2 - 13.3	14.8	11.4 - 18.9	13.1	10.8 - 15.9
Western Cape	18.7	15.1 - 23.0	18.7	15.7 - 22.3	18.9	16.4 - 21.7	15.9	14.2 - 17.8	17.9	16.2 - 19.7	16.3	15.0 - 17.7

The prevalence reported in 2015, 2017, 2019 and 2022 is for both first and follow-up visit attendees

PMTCT cascade – the first and second 95

Based on medical records review, 99.8%¹² (3 714) of women attending ANC were offered HIV testing or knew their HIV positive status . Most of the ANC attendees offered the test accepted (99.9%, 3 670) the offered test or already knew their HIV-positive status. From the 659 (16.3%) participants found to be HIV-positive by EIA test, 90.9% (599) already knew their HIV-positive status at the time of the survey (Figure 109). By district, West Coast, Eden and Cape Winelands districts had the lowest knowledge of HIV status (87.8%, 89.0% and 89.0%, respectively) while Overberg had the highest knowledge of HIV status at 94.9%.

Excluding 16 (2.7%) participants whose treatment status was not reported, 97.8% (583) had initiated ART at the time of the survey among those who knew their HIV-positive status. At a district level, among those who knew their status, ART initiation ranged from 96.6% (Cape Town) to 100.0% in Central Karoo and West Coast districts. Initiation of ART increased or remain constant between 2019 and 2022 in all districts in the province.

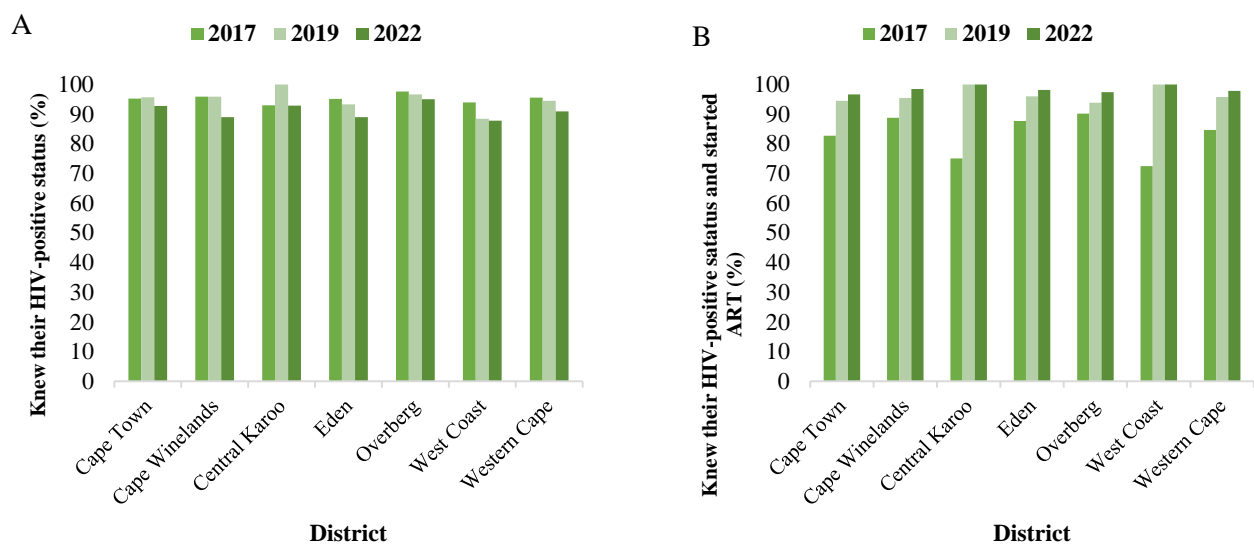


Figure 137: Knowledge of HIV-positive status and ART initiation at the time of the survey by district, in the 2017, 2019 and 2022 Antenatal HIV Sentinel Surveys, Western Cape

Knowledge of HIV-positive status and ART initiation before pregnancy

Knowledge of HIV status before pregnancy was 80.0% in Western Cape, which was higher than the national average (78.1%). Among those who knew their HIV-positive status prior to pregnancy and had a reported treatment status (438), 72.8% (319) started ART before pregnancy (Figure 110).

At district level, knowledge of HIV status before pregnancy ranged from 71.2% in Overberg, to 92.3% in Central Karoo in 2022. ART initiation before pregnancy was the lowest in Cape Town (68.2%) while Overberg the highest ART initiation before pregnancy at 81.6%. In all districts, the percentage of women who knew their HIV positive status and initiated ART prior to pregnancy decreased in 2022 compared to 2019.

⁹325 (8%) missing response excluded when calculating percentage

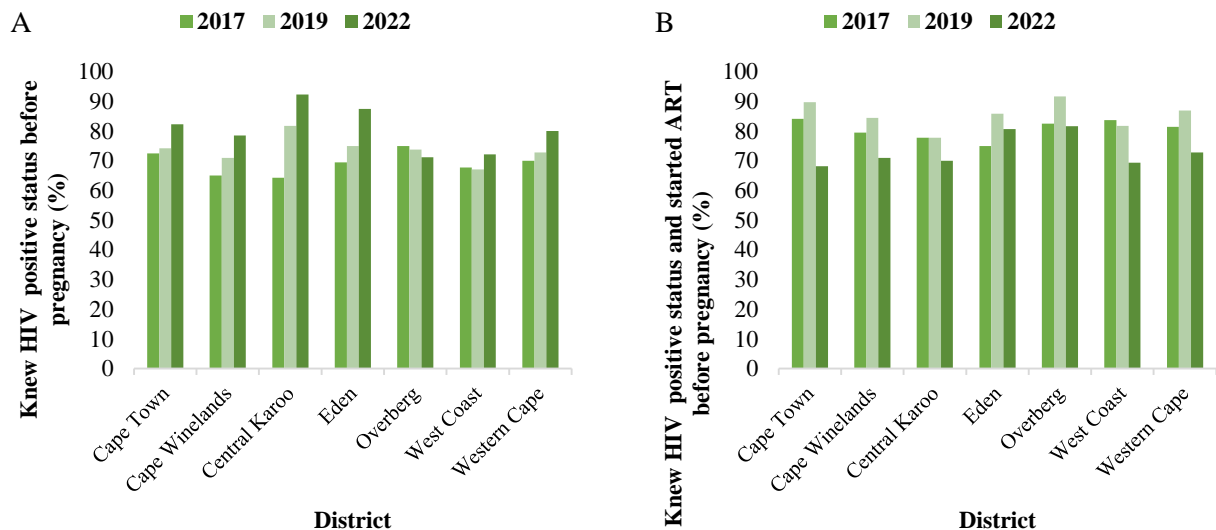


Figure 138: Knowledge of HIV-positive status and ART initiation before pregnancy by district, in the 2017, 2019 and 2022 Antenatal HIV Sentinel Survey, Western Cape

Viral Load Monitoring

In Western Cape, viral load testing coverage was 80.5% (326 out of 405) and it was greater than 70.0% across all districts in the province (Figure 111). Among those who had a viral load test done and were due for a viral load test, 80.4% (262/326) had received their viral load results. Of those who had a viral load test done and received results, viral suppression (<50 copies/ml) was at 76.3%.

At a district level, the lowest viral load testing coverage was in Cape Winelands (73.6%, 95% CI: 67.4 – 79.1%) and Cape Town had the highest viral load testing coverage (87.4%). Only 66.7% (95% CI: 43.9 – 83.6) had received viral load test results in the Central Karoo district while 93.9% (95% CI: 88.1 – 97.0) who had received results in Eden. Viral load suppression was the lowest in West Coast at 65.5% (95% CI: 50.3 – 78.1) and the highest in Overberg at 87.1% (95% CI: 77.6 – 92.9).

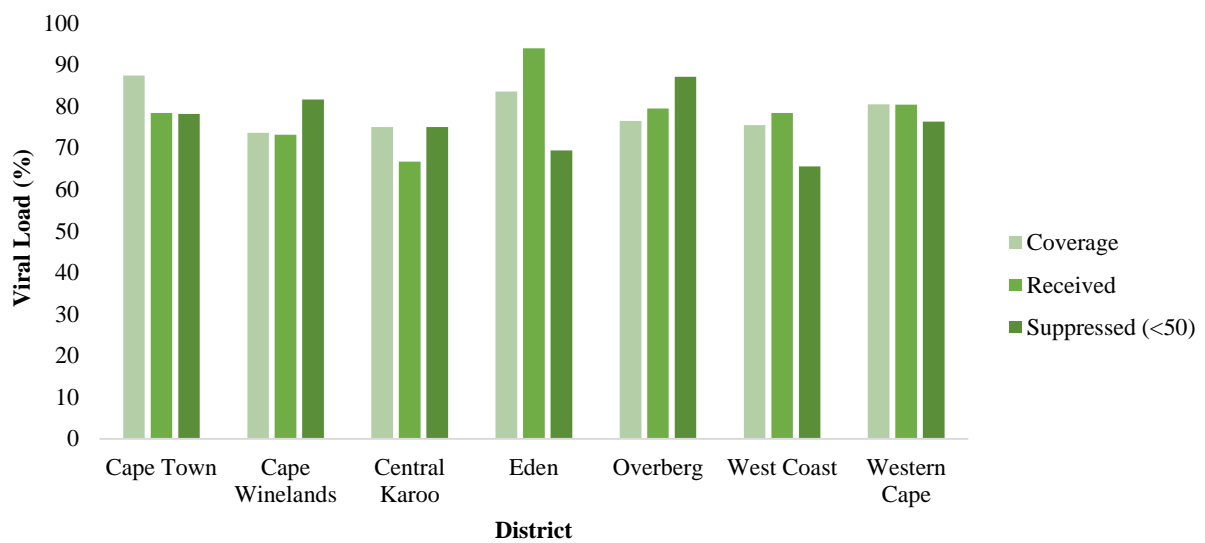


Figure 139: Viral load testing among antenatal women by district, in the 2022 HIV Antenatal Survey, Western Cape

PrEP Coverage

In Western Cape, 39.9% (713 out of 1 126 negative women) were eligible for PrEP. Prior use of PrEP was 0.7% (95% CI: 0.5 – 1.0) among those who were PrEP eligible and whose prior use of PrEP use was reported (Figure 112). Only Cape Town had PrEP eligible women who reported prior use of PrEP at 2.7% (95% CI: 1.9 – 3.8). In the remaining five districts, there were no pregnant women who reported using PrEP prior to pregnancy. Among PrEP eligible women whose current use of PrEP was reported, 0.2% (95% CI: 0.1 – 0.4) were taking PrEP during the current pregnancy. Cape Town and Cape Winelands districts were the only districts that reported having eligible women on PrEP during current pregnancy at 0.4%, 95% CI: 0.1 – 1.1% and 0.4% (95% CI: 0.1 – 1.3), respectively. The remainder of districts did not have PrEP eligible women who reported taking PrEP in the current pregnancy.

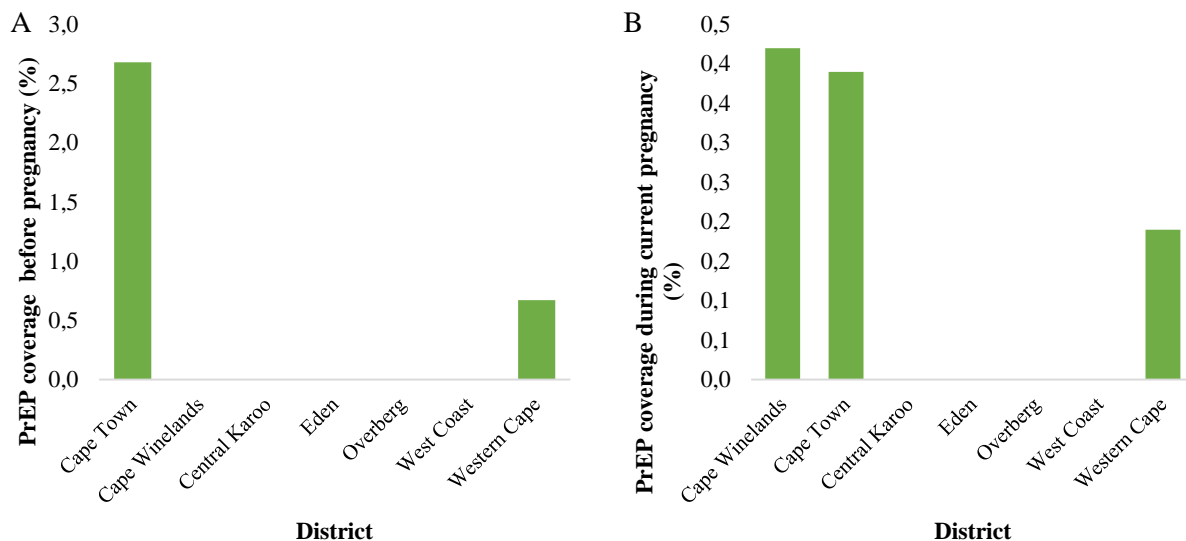


Figure 140: PrEP coverage before pregnancy (A) and during current pregnancy (B) by district, in the 2022 Antenatal HIV Sentinel Survey, Western Cape

Early ANC attendance

In Western Cape, 39.0% of the participants attended their first-ANC-visit before or at 12 weeks of pregnancy (Figure 113), while 71.9% attended their first-ANC-visit before 20 weeks of gestational age. At a district level, the lowest attendance of ANC before 20 weeks was 66.5% in West Coast and the highest was 78.4% in Central Karoo. Attendance of ANC before 20 weeks was higher than the national average (61.0%). Attendance of ANC before 20 weeks, compared to the national average (61.0%) was higher among women with high (≥ 4) gravidity (70.2%), those only with a primary education (69.9%), adolescent girls (67.9%) and those older than 40 years (70.0%). Single women (55.6%) and those with no education at all (56.3%) had ANC attendance before 20 weeks that was lower than both the provincial (71.9%) and national (61.0%) averages.

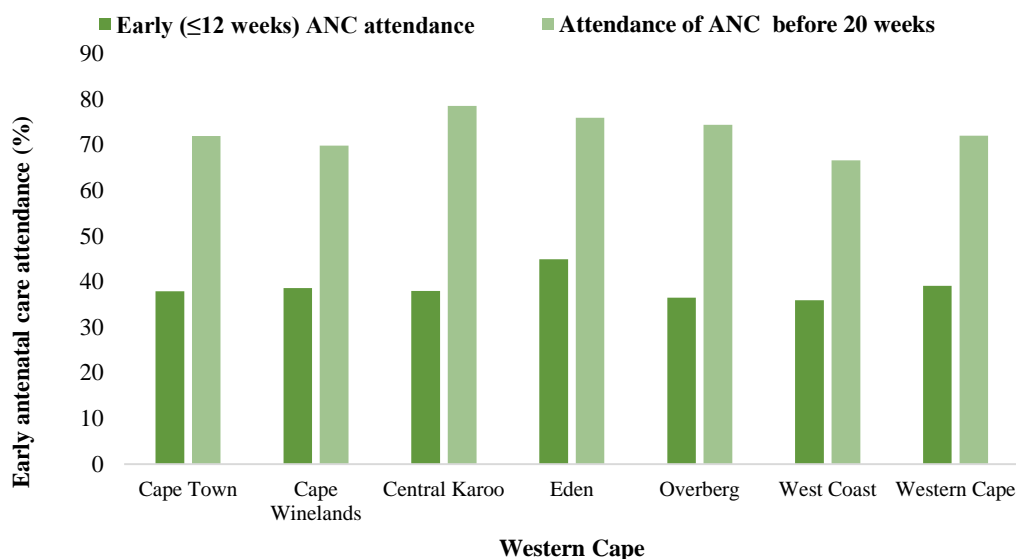
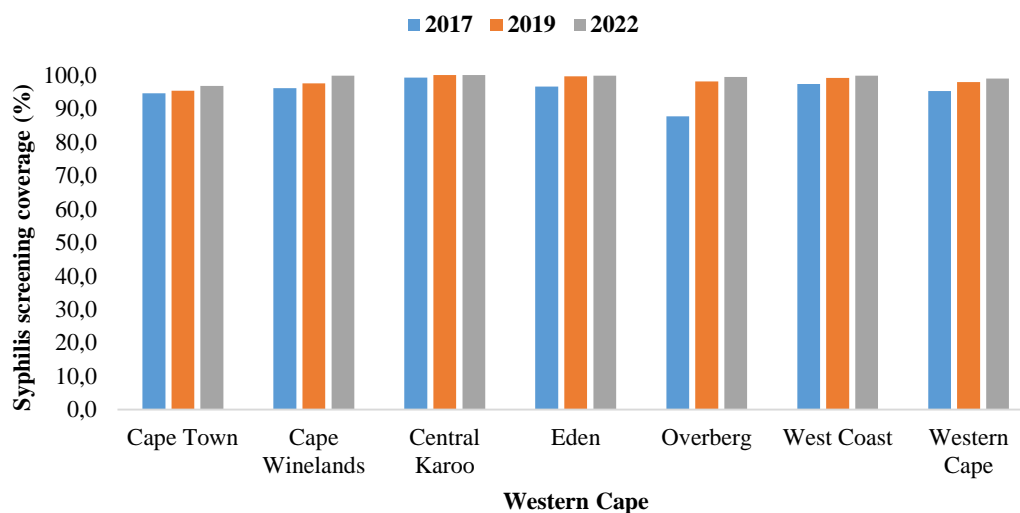


Figure 141: Early attendance of antenatal care by province in the 2022 Antenatal HIV Sentinel Survey, Western Cape

Maternal syphilis screening and treatment coverage

For Western Cape, maternal syphilis screening coverage was 99.0% (Figure 114). All districts in the districts had syphilis screening coverage greater than 96.0%, with the highest coverage at 100.0% (Central Karoo).

With respect to syphilis screening coverage, 1.95% (79) of the participants had missing data. If we assume that all missing responses indicate the participant did not receive the screening test, and include them as such in the denominator, coverage for syphilis screening in Western Cape decreased from 99.0% to 97.1%.



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

Figure 142: Maternal syphilis screening coverage among antenatal women, in the 2017, 2019, 2022 Antenatal HIV Survey, Western Cape

Of the women who had syphilis screening, 3.8% (145) were positive, 93.6% (3 537) were negative, 2.5% (93) had pending results, 0.1% (4) did not have results in file (Figure 115). Of those who had a test, a combined 17.1% had missing results (either due to pending in the laboratory or due to not being in patient file). The lowest percent of missing results was in Cape Winelands (0.7%) and the highest was in Central Karoo (3.9%).

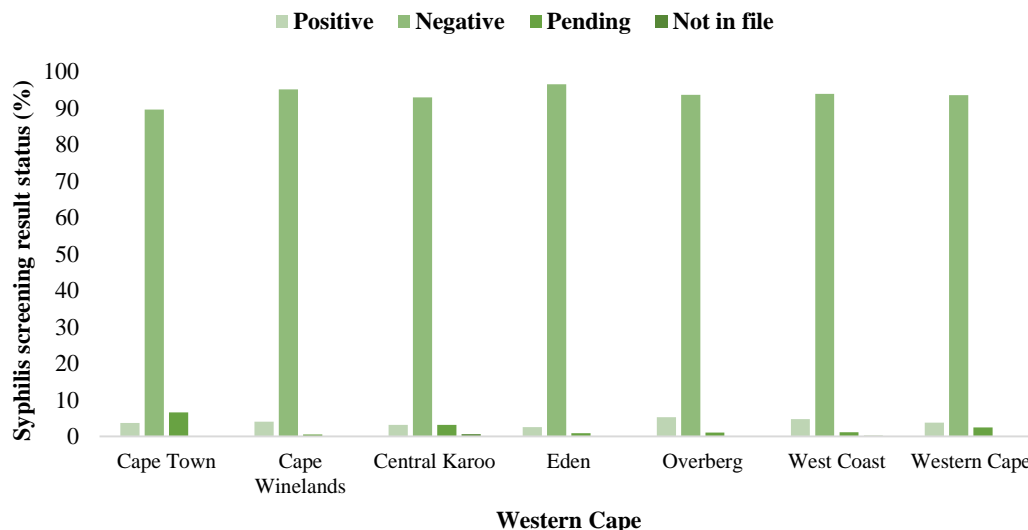
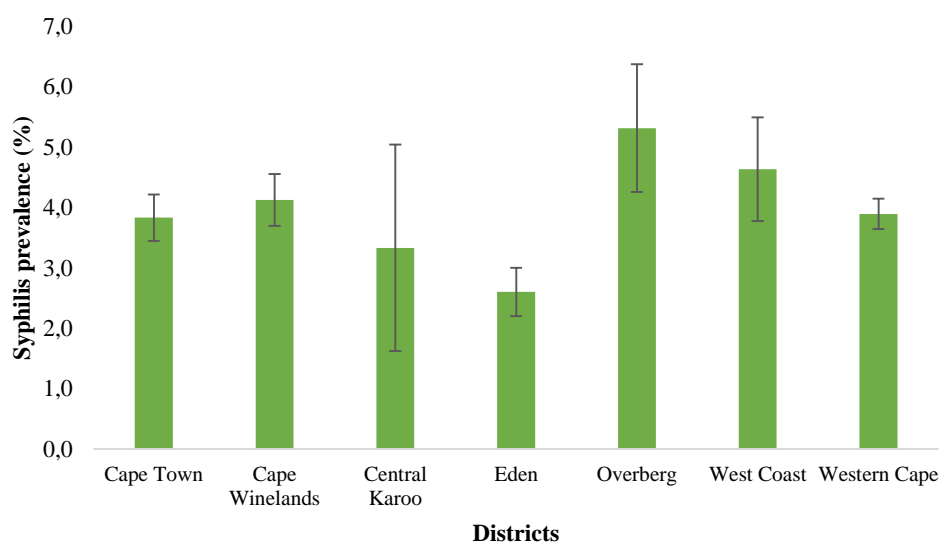


Figure 143: Maternal syphilis screening test result status by district, in the 2022 Antenatal HIV Sentinel Survey, Western Cape

Once the pending results and the results not in file were excluded, the prevalence of syphilis (per medical record review data) among those who had syphilis test result, was 3.9% (95% CI: 3.4 – 4.4) overall (Figure 116). In Overberg, the prevalence of syphilis was highest at 5.3% (95% CI: 3.6 – 7.8) and the lowest was in Eden District at 2.6% (95% CI: 1.9 – 3.5).



The denominator syphilis prevalence was the number of women who received syphilis test results. Missing data excluded
Figure 144: Maternal syphilis prevalence among antenatal women, in the 2022 HIV Antenatal Survey, Western Cape

Among those who were syphilis-positive and whose syphilis treatment status was reported (140), 94.3% (132) received treatment for syphilis. Of those treated for syphilis and had type of treatment data reported (132, 90.9% (120) were treated with at least one dose of BPG (Figure 117). If we assume that all missing responses mean that the subjects did not receive treatment for syphilis and include as such the missing data in the denominator, the coverage of syphilis treatment decreases from 94.3% to 86.2%.

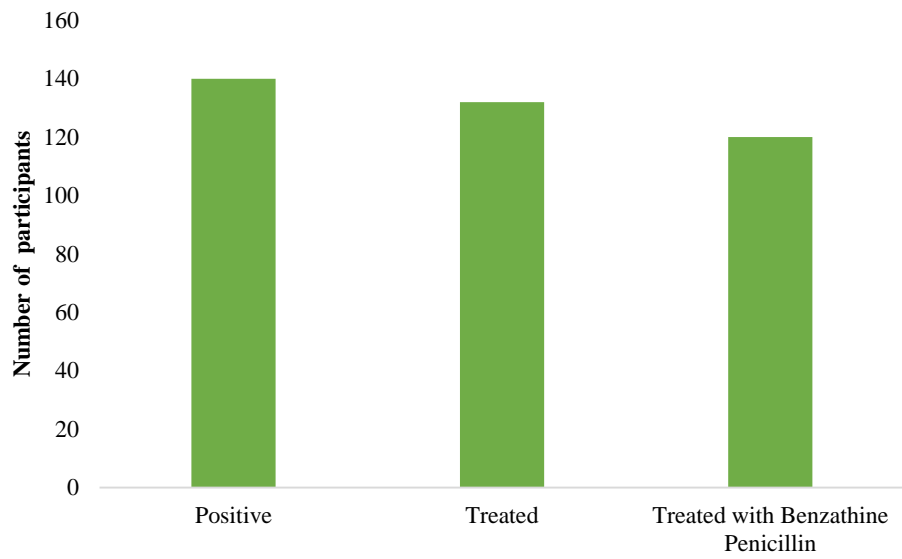


Figure 145: Syphilis treatment cascade among antenatal women, in the 2022 HIV Antenatal Survey, Western Cape