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PrEP Awareness and Coverage: Results from the 2022 South Africa Antenatal HIV Sentinel Survey

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Abstract

Pregnant women have a high HIV incidence in South Africa (SA), increasing the risk of mother-to-child transmission (MTCT) of HIV. Strengthening coverage of HIV prevention strategies such as pre-exposure prophylaxis (PrEP) is essential to ending the epidemic in SA. We estimated awareness and coverage of PrEP among pregnant women attending antenatal clinics. Using the national cross-sectional antenatal HIV sentinel survey SA, that was conducted from February to April 2022, we performed descriptive and survey logistic regression analyses. Women were deemed as aware about PrEP if they reported ever having heard of PrEP. Women were eligible for PrEP if they were HIV-negative and had either: (1) an HIV-positive/status-unknown partner; (2) multiple sexual partners in the past twelve months; (3) a sexually transmitted infection in the preceding six months; or (4) sex under the influence of alcohol/drugs in the past six months. 31.18% ($n = 7\,271$) of HIV-negative women were eligible for PrEP. Among eligible women, 33.65% ($n = 2\,403$) were aware about PrEP, 3.58% ($n = 271$) took PrEP before pregnancy, and 6.50% ($n = 507$) were currently on PrEP. Compared to follow-up visit attendees, first ANC visit attendees were less likely to be: (1) aware about PrEP (adjusted odds ratio (aOR) = 0.65; 95% confidence interval (CI): 0.59–0.72), and (2) to currently be on PrEP (aOR = 0.69; 95% CI: 0.57–0.84). Women who had never tested for HIV before pregnancy were less likely to: (1) be aware about PrEP (aOR = 0.51; 95% CI: 0.45–0.59), and (2) currently be on PrEP (aOR = 0.56; 95% CI: 0.43–0.74) compared to those who had tested for HIV before pregnancy. Women who reported having an HIV-positive partner compared to those with an HIV-negative partner had higher: (1) PrEP awareness (aOR = 2.21; 95% CI: 1.80–2.71), and (2) PrEP coverage during pregnancy (aOR = 8.51; 95% CI: 6.43–11.25). Overall PrEP awareness and coverage were low. PrEP is being integrated into safe conception programs as an HIV prevention strategy. Entry into ANC presents an important opportunity to prevent new HIV infections among new mothers, accelerating the elimination of MTCT of HIV in the country.

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Declarations

Conflict of Interest The authors have no conflict of interest to declare.

Keywords

PrEP; Pregnant women; South Africa; Antenatal care

Introduction

South Africa (SA) continues to be at the epicentre of the HIV epidemic, with an estimated 7.6 million people living with HIV (PLHIV) in 2022 [1]. Among PLHIV in SA, women (≥ 15 years) are disproportionately affected by HIV, accounting for 63% of PLHIV while men (≥ 15 years) only account for 34% of PLHIV [1]. Moreover, the 2022 National Antenatal HIV Sentinel Survey estimated that the national HIV prevalence was 27.5% among pregnant women (15–49 years) attending antenatal care (ANC) [2]. In addition to the high HIV prevalence among women, the HIV incidence in women is also higher than in men. Out of the 160 000 new HIV infections that occurred in the country in 2022, 100 000 new infections were among women aged ≥ 15 years while only 52 000 new infections were among men in the same age group [1]. Among pregnant women, the HIV incidence was estimated to be 1.5% in the 2017 SA National Antenatal HIV Sentinel Survey [3].

Over the years, in South Africa antiretroviral therapy (ART) treatment as prevention has helped reduce HIV incidence, along with condom promotion and voluntary medical male circumcision [4]. To prevent new HIV infections, a combination prevention approach remains essential. Thus, the strengthening of coverage of pre-exposure prophylaxis (PrEP) for people with an HIV-negative status has been a game-changer for ending the epidemic [5]. PrEP prevents HIV acquisition by providing antiretroviral drugs to people who are HIV-negative before potential HIV exposure [6, 7]. In 2015, the WHO expanded PrEP recommendations to all people at substantial risk of HIV due to the effectiveness of PrEP in preventing HIV acquisition [6]. The shift in the WHO PrEP recommendations was informed by evidence from trials demonstrating the effectiveness of PrEP in preventing HIV infection [6]. Shortly after SA began to supply PrEP in 2016 [8], the WHO expanded PrEP recommendations to include pregnant and breastfeeding women as a means to prevent mother-to-child transmission (MTCT) of HIV [9]. In SA, PrEP has been integrated into existing health services, including ANC, for pregnant women at substantial risk for HIV [10]. However, only in the 2023 PMTCT guidelines is PrEP recommended as an HIV prevention intervention for HIV-negative pregnant and breast-feeding women [11].

In terms of PrEP coverage in South Africa, it was estimated to be $< 1\%$ [12] with over 1 million PrEP initiations towards the end of 2024 [13]. Research in South Africa supports that PrEP uptake reduces HIV incidence [14]. Common barriers to PrEP use in South Africa include long wait times at facility [15, 16], lack of knowledge about PrEP [17–19], and concerns about safety among pregnant women [20, 21]. In the 2023–2028 National Strategic Plan for HIV, TB and STIs for South Africa, increasing access and coverage of HIV prevention services, including PrEP, among pregnant women is one of the key strategies to accelerate the country's goal to eliminate MTCT of HIV [22]. Thus, in alignment with the country's goal, we examined PrEP awareness and coverage among pregnant women

participating in the 2022 National Antenatal HIV Sentinel Survey to better understand PrEP coverage among pregnant women in SA.

Methods

The national Antenatal HIV Sentinel survey is a cross-sectional survey conducted every two years across all 52 districts in the nine South African provinces. The 2022 edition of the survey was conducted in 1 595 public health facilities which were selected using a stratified cluster sampling method. The probability proportional to size method was used to select sites within each district. The survey was conducted among pregnant women between 15 and 49 years of age attending ANC either for the first time or for a follow-up visit in the sampled facilities. This study excluded pregnant women who previously visited the clinic during the survey data collection period and those who were < 15 or > 49 years. A study barcode sticker was placed on the medical record of each survey participant to indicate their survey participation. The barcode was then used to identify and exclude women who already participated in the survey. Detailed methods have been previously described [23].

The 2022 survey was conducted from February to April 2022 and included 37 828 pregnant women. Health workers or antenatal nurses collected data as they provided routine ANC services. Data collection consisted of a brief interview, medical records data abstraction and blood specimen collection from consenting eligible pregnant women. The following were extracted from medical records: women's age, ANC visit number (could range from 1 to 8 visits based on national guidelines [24]), HIV testing, trimester at 1st ANC, and syphilis test results (these were positive or negative as determined and documented by a provider). For syphilis testing, the National Department of Health (NDoH) Sexually Transmitted Infections (STIs) Management Guidelines recommend using a Rapid Plasmin Reagin test along with a specific treponemal test [25]. Data were also collected by self-report which included the participant's ethnicity, education, marital status, parity, HIV testing before pregnancy, number of sexual partners, HIV status of the partner, and prior and current PrEP coverage.

Data Analysis

For this analysis, the primary outcomes included: (1) PrEP awareness, (2) PrEP coverage before current pregnancy, and (3) PrEP coverage during their current pregnancy. Women were considered to be eligible for PrEP if they were HIV-negative (based on medical record review) and had either: (1) an HIV-positive/status-unknown partner; (2) multiple sexual partners (defined as > 1 sexual partner) in the past twelve months; (3) a self-reported STI in the preceding six months (yes/no); or (4) sex under the influence of alcohol or drugs in the past six months. The eligibility criteria were based on the NDoH guidelines for PrEP provision [7]. PrEP awareness was defined as the proportion of those who responded with a "yes" when asked, "have you ever heard of PrEP before today?" PrEP coverage before the current pregnancy was defined as the proportion of those who were PrEP eligible and reported having been taking PrEP before this pregnancy. Current PrEP coverage was defined as the proportion of those pregnant women who were eligible for PrEP and responded with a "yes" when asked "are you currently taking PrEP?" It is possible for a participant to be

aware about PrEP, have used PrEP before current pregnancy and use PrEP during the current pregnancy.

We performed analyses using STATA 17 (StataCorp. 2021. *Stata Statistical Software: Release 17*. College Station, TX: StataCorp LLC). The analysis accounted for survey design (clustering within facilities and stratification by district) and was weighted using the Statistics South Africa 2021 mid-year population size of women of reproductive age (15–49 years) at the provincial level. We conducted a complete-case analysis. We performed descriptive and survey logistic regression analyses. Crude and multivariable logistic models were used to assess factors associated with outcomes of interest (PrEP awareness and coverage). The multivariable models were adjusted for age, education, gravidity and province, which were selected based on a review of prior literature [26–30]. We reported odds ratios (OR), adjusted odds ratio (AOR), and 95% confidence intervals (CIs).

Ethical Considerations

Survey participation was voluntary. Written informed consent was obtained from participants at enrolment. Ethical approval was obtained from the University of the Witwatersrand Human Research Ethics Committee (Medical) (M170556) and also from the nine provincial health research ethics committee. This activity was reviewed by CDC, deemed not research, and was conducted consistent with applicable federal law and CDC policy.¹

Results

A total of 37,828 women were enrolled in the 2022 antenatal survey, of which 22 655 (60.20%) had HIV-negative test results based on medical records (Table 1). Among the HIV-negative women, 7 271 (31.18%) were eligible for PrEP while 68.82% ($n = 15\,384$) were ineligible for PrEP.

Of the 7 271 women eligible for PrEP, the median age was 24 years (interquartile range (IQR): 20–30) and 50.24% ($n = 3\,761$) were aged 15–24 years. Majority of the participants had up to a secondary level education (71.82%, $n = 5\,291$), and were of African/black ethnicity (86.99%, $n = 6\,279$). Over one-third of women were first time ANC visit attendees (33.96%, $n = 2\,345$) while 30.86% ($n = 2\,265$) were fourth-ANC visit attendees. HIV testing before the current pregnancy was common (76.90%, $n = 5\,561$). More than half of the women were not cohabiting but in a relationship with the father of the baby (57.80%, $n = 4\,112$). The majority (83.53%, $n = 6\,092$) of participants reported having one sexual partner in the past twelve months. Among eligible women, 4.00% ($n = 299$) reported having an HIV-positive sexual partner and 68.23% ($n = 4\,976$) reported not knowing their sexual partner's HIV status. Overall, 5.94% ($n = 462$) of all participants were positive for syphilis.

¹§See e.g., 45 C.F.R. part 46, 21 C.F.R. part 56; 42 U.S.C. § 241(d); 5 U.S.C. § 552a; 44 U.S.C. § 3501 et seq.

PrEP Awareness

Of the 7 271 PrEP eligible women, 33.65% ($n = 2\,403$) were aware of PrEP (Table 2). Among PrEP eligible women who were PrEP aware, 49.48% ($n = 1\,219$) were aged 15–24 years, 71.43% ($n = 1\,724$) reported having up to a secondary education, and 95.68% ($n = 2\,297$) were of African or black ethnicity. Just over one third (34.09%, $n = 814$) were attending ANC for a fourth visit, 83.04% ($n = 1\,991$) reported having received an HIV test before pregnancy, and 63.97% ($n = 1\,612$) were in a relationship but not cohabiting with the father of the baby. Most reported having one sexual partner (84.21%, $n = 2\,023$) in the past twelve months, and having a partner with an unknown HIV status (61.33%, $n = 1\,475$). Among participants aware of PrEP, 5.55% ($n = 143$) had a documented positive syphilis test result.

In the adjusted logistic model (Table 3), PrEP eligible women with a tertiary level education had a greater likelihood of having PrEP awareness (adjusted odds ratio (aOR) = 1.66, 95% CI: 1.46–1.89). Women who were of African or black ethnicity were more likely to be PrEP aware than those of other ethnicities (aOR = 3.41, 95% CI: 2.79–4.16). First-ANC visit attendees were less likely to be PrEP aware compared to those with follow-up ANC attendees (aOR = 0.65, 95% CI: 0.59–0.72). Those who had never tested for HIV before pregnancy were less likely to have PrEP awareness compared to those who reported having HIV testing before pregnancy (aOR = 0.51, 95% CI: 0.45–0.59). The likelihood of PrEP awareness was lower among married or cohabiting women compared to those not cohabiting or in a relationship with the father of the baby (aOR = 0.65, 95% CI: 0.59–0.73). Compared to women who had a HIV-negative partner, women who had an HIV-positive partner were more likely to be PrEP aware (aOR = 2.21, 95% CI: 1.80–2.71). Additionally, women with a status unknown partner were less likely to be PrEP aware compared to women who had a HIV-negative partner (aOR = 0.70, 95% CI: 0.63–0.79). PrEP awareness was more likely among women who attended their first ANC booking in the first trimester (aOR = 1.38, 95% CI: 1.11–1.73) and second trimester (aOR = 1.28, 95% CI: 1.05–1.57) compared to women who attended their first ANC booking in the third trimester.

PrEP Coverage Before Pregnancy

Of the PrEP eligible women ($n = 7\,271$), 3.58% ($n = 271$) reported taking PrEP before their pregnancy (Table 2). Women taking PrEP before pregnancy were primarily aged 15–24 years ($n = 124$, 45.98%), had up to a secondary education ($n = 209$, 78.05%), and were of African or black ethnicity ($n = 270$, 99.71%). About one-third were first-ANC visit attendees (32.62%, $n = 82$), 90.52% ($n = 243$) had tested for HIV prior to pregnancy, and most women were not cohabiting but in a relationship with the father of the baby ($n = 180$, 64.06%). Majority of the women reported having had one sexual partner in the past twelve months (76.39%, $n = 209$). In addition, 38.28% of respondents reported having a partner with an unknown HIV status ($n = 109$) and 6.57% ($n = 19$) of the participants had a positive test result for syphilis.

From the adjusted model (Table 4), women of African or black ethnicity more likely to use PrEP prior to pregnancy than women of another ethnicity (aOR = 38.27; 95% CI: 7.24–

202.32). The likelihood of PrEP coverage prior to pregnancy was lower among participants who had never tested for HIV prior pregnancy (aOR = 0.24, 95% CI: 0.15–0.36) and for those married or cohabiting with the father of the baby (aOR = 0.65, 95% CI: 0.51–0.85). Women who had multiple partners in the past twelve months were more likely to be on PrEP prior to pregnancy (aOR = 1.69, 95% CI: 1.32–2.17). Participants with a HIV-positive partner were more likely to be on PrEP prior to pregnancy (aOR = 6.45, 95% CI: 4.81–8.66), and those with a status unknown partner were less likely to be on PrEP prior to pregnancy (aOR = 0.41, 95% CI: 0.32–0.53).

PrEP Coverage During Current Pregnancy

From the women who were eligible for PrEP ($n = 7\,271$), only 6.50% ($n = 507$) were on PrEP during their current pregnancy (Table 2). The majority of participants currently on PrEP were aged 15–24 years (53.30%, $n = 279$), completed a secondary level education (77.33%, $n = 391$) and were of African or black ethnicity (98.29%, $n = 498$). Nearly one-third of the women were attending their fourth ANC visit (29.79%, $n = 156$), more than 80% reported having had HIV testing prior to pregnancy (82.64%, $n = 412$), and 67.84% ($n = 356$) were not cohabiting but in a relationship with the father of the baby. Most participants reported having one sexual partner (86.40%, $n = 440$), and having a partner with an unknown HIV status (55.40%, $n = 288$). From those currently on PrEP, 7.54% ($n = 39$) tested positive for syphilis.

Multivariable modelling (Table 5) showed, PrEP eligible women of African or black ethnicity had a greater likelihood of PrEP coverage during their current pregnancy (aOR = 15.32, 95% CI: 7.42–31.63). Those utilizing ANC for the first time (aOR = 0.69, 95% CI: 0.57–0.84) and those who reported never having had HIV testing before pregnancy (aOR = 0.56, 95% CI: 0.43–0.74) were less likely to be currently taking PrEP. The likelihood of PrEP coverage during current pregnancy was lower among married or cohabiting women (aOR = 0.63, 95% CI: 0.51–0.77). Women with a HIV-positive partner were 8.51 (95% CI: 6.43–11.25) times more likely to use PrEP during their current pregnancy compared to women with a HIV-negative partner. Moreover, those who tested positive for syphilis (aOR = 1.46, 95% CI: 1.07–2.00) were more likely to use PrEP during their current pregnancy.

Discussion

In this study, we examined PrEP awareness and PrEP coverage among pregnant women attending ANC clinics in SA. We found, 31.12% of HIV-negative pregnant women attending public health facilities in SA had substantial risk of acquiring HIV, and were thus, eligible for PrEP. However, only 33.65% of women with substantial risk of HIV were PrEP aware, with 3.58% having taken PrEP before pregnancy, and 6.50% currently on PrEP.

In terms of the low PrEP awareness found in this study, similarly, a study conducted in 2016 among pregnant and postpartum women in Cape Town found that 33.00% of the participants were aware about PrEP [31]. However, in another PrEP study conducted in Durban from 2018 to 2019, only 9.10% of the women had heard about PrEP prior to study enrolment [32]. A systematic review on HIV PrEP in Sub-Saharan Africa showed that PrEP awareness

ranged from 23–98% [33]. Our findings revealed that PrEP awareness was associated with education level, specifically those who had a higher-level education (tertiary) were more likely to be PrEP aware compared to those with a secondary level education or less. Similar to our findings, a study conducted in SA revealed that PrEP awareness was higher among university students (9.80%) than primary health care clinic attendees (2.50%) [34]. In addition, a population-based survey analysis on women in 5 Sub-Saharan African countries revealed that those with a primary or secondary/higher education (compared to no education) were more likely to be aware about PrEP [35].

Study findings revealed, PrEP awareness was lower among those were first-ANC visit attendees, and among those who reported never having had HIV testing before their current pregnancy. Prior research has shown a lack of awareness that PrEP is available in public health facilities [34]. Similarly, a study among women in Sub-Saharan Africa revealed that those with a least one ANC follow-up had higher PrEP awareness [35]. Furthermore, women who do not utilize ANC tend to not have access to healthcare, specifically access to HIV testing services or HIV prevention services and therefore might be unaware of PrEP availability until entry into ANC. Our findings also highlight the importance of ANC as a health education platform and the need to make health information available through other channels for non-pregnant women. Moreover, we found that PrEP awareness was lower among those who were married or cohabiting with the father of their baby. Married or cohabiting women might not perceive themselves as being at risk of acquiring HIV and/or may not engage in HIV-related risk behaviours. Risk perception plays a substantial role in the use of HIV prevention services, including PrEP [36].

We showed that PrEP awareness and PrEP coverage (prior and current) were higher among those with a HIV-positive partner, which aligns with PrEP guidelines [10]. The two most common reasons for PrEP initiation among women of reproductive age in Kenya were having a sexual partner of either known HIV-positive status or unknown HIV status [37]. A Sub-Saharan Africa systematic review found that knowledge of partner's HIV status was a determinant of PrEP awareness [33]. Moreover, PrEP is a recommended safe conception strategy in the setting of HIV sero-different partnerships [38]. In contrast to prevailing literature, we found that the odds of being PrEP aware and using PrEP prior to pregnancy were significantly lower among women whose sexual partner's HIV status was unknown. Additionally, we found no association between current use of PrEP and having a partner with unknown status. Two qualitative studies in SA revealed, having a status unknown partner was a motivating factor for PrEP usage [20, 36]. Our findings could be attributed to low risk perception [39] or other, as yet unidentified factors, underscoring a potential area for improved counselling in ANC and other settings.

In this study, although nearly one-third of pregnant women had substantial risk for HIV infection, the prevalence of current PrEP use (6.50%) and prior PrEP use (3.58%) was low. A study conducted in Eastern Cape among adolescents and young adults aged 16–24 years found that PrEP use (ever) was 1.70% [40]. The low PrEP coverage among pregnant women in our study is supported, in part, by findings from a qualitative study on the influences of PrEP adherence—this study found that women discontinued PrEP during pregnancy due to fears of adverse consequences on the baby [21].

Study findings show that women who reported never having HIV testing prior to their current pregnancy and women who were married or cohabiting were less likely to use PrEP both prior to their pregnancy and during their pregnancy. Conversely, those who had multiple partners in the past twelve months were more likely to be on PrEP prior to pregnancy. A study among urban men who have sex with men in the United States showed that having multiple sexual partners was associated with PrEP coverage [41]. Findings among those who had never tested for HIV prior to pregnancy, those married or cohabiting and those with multiple sexual partners speak to risk perception. Research has shown higher levels of PrEP initiation among women who perceive themselves to be at risk of acquiring HIV [32, 36].

Furthermore, our study results show that first-ANC visit attendees were less likely to be currently taking PrEP. Prior research has shown that lack of awareness of PrEP availability at clinics is common [34]. There is a possibility that women presenting to ANC could be accessing HIV care and prevention services for the first time, and thus learn about their HIV status and HIV prevention resources such as PrEP at this initial ANC visit. As a recommendation, PrEP awareness and education interventions are needed to increase awareness about PrEP availability at public clinics in South Africa. Lastly, study findings show, those who tested positive for syphilis were more likely to use PrEP during current pregnancy. According to PrEP guidelines, PrEP should be offered to those at substantial risk of HIV infection, which includes those who have had an STI in the recent past [10].

Limitations to the ANC Sentinel Survey include that this survey was restricted to public health facilities and does not capture pregnant women accessing ANC at private facilities. However, our sample is representative of the general population given that the majority of pregnant women utilize public ANC services in SA [42]. Moreover, the ANC Sentinel Survey's cross-sectional design captures pregnant women at a single point in time and cannot be followed over time to determine PrEP persistence, the HIV status of both the mother and infant at delivery, and PrEP initiation after study enrolment. In addition, our study is limited to the self-reported HIV status of the partner, therefore, there might be under-reporting, especially among women with an HIV-positive partner. Another limitation is the inclusion of HIV-negative women with HIV-positive partners as eligible for PrEP. Under the NDoH guidelines [7], this is not a PrEP priority criterion unless the partner is virally unsuppressed, unfortunately, data on partner's viral suppression was not available. However, it is important to note, women with HIV-positive partners constituted only 4% of the women designated eligible for PrEP. Lastly, our analysis is limited to pregnant women eligible for PrEP based on the NDoH guidelines. Although the eligibility criteria helped to identify those at substantial risk, PrEP is accessible to all HIV-negative people who request PrEP, including those who are not substantial risk of HIV based on the criteria. Despite the limitations, as a strength, our study consisted of a nationally representative study sample that consists of a large sample size and as such, our results can be generalizable to HIV-negative pregnant women in SA. We expect our findings to still be applicable given that only now do the PMTCT guidelines (2023) [11] recommends PrEP to be used as an HIV prevention intervention for HIV-negative pregnant and breastfeeding women, and in the general population PrEP coverage is still relatively low (< 1% in 2023) [12].

Conclusion

In conclusion, PrEP awareness and coverage was low among eligible pregnant women with substantial risk for HIV acquisition. PrEP is being integrated into safe conception programs as a HIV prevention strategy. Entry into ANC presents an important opportunity to prevent new HIV infections among mothers and accelerate elimination of MTCT of HIV in the country. Educational initiatives could be considered in efforts to inform women about PrEP, PrEP availability at public clinics, and about the risk of HIV acquisition during pregnancy.

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Characteristics of HIV-Negative, PrEP Eligible and PrEP Ineligible Pregnant Women Enrolled in the 2022 ANC Sentinel Survey, South Africa (N = 22 655)

Characteristics	Total HIV Negative		HIV negative PrEP Eligible		HIV negative PrEP Ineligible	
	n	%	n	%	n	%
Total	22655	60.20	7271	31.18	15384	68.82
Age (years)						
15–24	10718	45.89	3761	50.24	6957	43.92
25–29	5947	26.78	1767	24.65	4180	27.74
30–34	3721	17.12	1077	15.55	2644	17.83
35–39	1823	8.25	534	7.64	1289	8.52
40–44	422	1.86	127	1.85	295	1.87
45–49	24	0.10	5	0.06	19	0.11
Education						
None	143	0.66	60	0.90	83	0.56
Primary Schooling	1943	8.82	764	10.93	1179	7.86
Secondary Schooling	16420	71.57	5291	71.82	11129	71.45
Tertiary Schooling	3776	17.33	1052	14.93	2724	18.43
Missing	373	1.62	104	1.43	269	1.70
Ethnicity						
African	19185	85.39	6279	86.99	12906	84.67
Asian	200	0.91	48	0.75	152	0.98
Coloured	2599	10.70	792	10.15	1807	10.95
White	426	1.86	107	1.41	319	2.07
Other	178	0.85	30	0.47	148	1.02
Missing	67	0.29	15	0.24	52	0.31
ANC visit						
First	6759	31.49	2345	33.96	4414	30.37
Second	4021	17.05	1307	17.25	2714	16.95
Third	3884	16.66	1205	15.82	2679	17.04
Fourth	7492	32.53	2265	30.86	5227	33.28
Missing	499	2.28	149	2.10	350	2.36

Characteristics	Total HIV Negative		HIV negative PrEP Eligible		HIV negative PrEP Ineligible	
	n	%	n	%	n	%
Total	22655	60.20	7271	31.18	15384	68.82
Received an HIV test before pregnancy						
Yes	17744	78.87	5561	76.90	12183	79.76
No	4256	18.45	1561	21.15	2695	17.23
Missing	655	2.68	149	1.95	506	3.01
Relationship with the father of the baby						
Married	3631	16.90	806	11.67	2825	19.26
Living together/cohabiting	5438	25.97	1648	24.91	3790	26.46
Not living together but in a relationship	12626	52.92	4412	57.80	8214	50.70
No relationship	814	3.53	365	5.03	449	2.85
Missing	146	0.68	40	0.58	106	0.73
Number of sexual partners in the past 12 months						
More than one	1009	4.39	1009	14.06	0	0.00
One sexual partner	18894	82.78	6092	83.53	12802	82.44
Missing	2752	12.83	170	2.40	2582	17.52
HIV Status of Partner						
Positive	299	1.25	299	4.00	0	0.00
Unknown	4976	21.36	4976	68.23	0	0.00
Negative	11972	53.74	1547	22.04	10425	68.19
Missing	5227	23.65	416	5.73	4811	31.81
Syphilis Status						
Positive	462	2.51	462	5.94	0	0.00
Negative	16906	97.49	5079	67.24	11827	74.07
Missing	5287	26.20	1730	26.82	3557	25.93

PrEP Awareness and PrEP Coverage among eligible pregnant women enrolled in the 2022 ANC Sentinel Survey, South Africa (N = 7 271)

Table 2

Characteristics	PrEP Awareness (N = 6888)		PrEP Use Before (N = 7133)		Current PrEP Use (N = 7122)	
	n	%	n	%	n	%
Total	2403	33.65	271	3.58	507	6.50
Age (years)						
15–24	1219	49.48	124	45.98	279	53.30
25–29	609	25.24	75	25.69	109	22.01
30–34	381	16.94	44	17.55	73	15.05
35–39	154	6.55	22	8.31	33	7.03
40–44	38	1.70	6	2.47	13	2.61
45–49	2	0.10	0	0.00	0	0.00
Education						
None	13	0.51	1	0.35	2	0.37
Primary schooling	167	7.11	11	5.32	43	8.63
Secondary schooling	1724	71.43	209	78.05	391	77.33
Tertiary schooling	470	19.66	45	16.19	61	11.96
Missing	29	1.28	5	1.44	10	1.71
Ethnicity						
African	2297	95.68	270	99.71	498	98.29
Asian	11	0.53	0	0	2	0.33
Coloured	70	2.73	1	0.29	3	0.39
White	17	0.68	0	0.00	1	0.20
Other	1	0.04	0	0.00	0	0.00
Missing	7	0.35	0	0.00	3	0.80
ANC visit						
First	652	28.64	82	32.62	128	27.04
Second	482	19.46	46	18.03	114	21.43
Third	421	16.32	53	18.02	101	19.53
Fourth	814	34.09	87	30.44	156	29.79
Missing	34	1.49	3	0.90	8	2.20
Received an HIV test before pregnancy						

Characteristics	PrEP Awareness (N = 6888)		PrEP Use Before (N = 7133)		Current PrEP Use (N = 7122)	
	n	%	n	%	n	%
Yes	1991	83.04	243	90.52	412	82.64
No	350	14.48	19	6.23	75	13.82
Missing	62	2.49	9	2.86	20	3.54
Relationship with the father of the baby						
Married	203	8.60	15	5.63	32	6.64
Living together/co-habiting	463	21.81	61	24.20	100	21.40
Not living together but in a relationship	1612	63.97	180	64.06	356	67.84
No relationship	106	4.76	13	5.56	13	2.54
Missing	19	0.87	2	0.55	6	1.54
Number of sexual partners in the past 12 months						
More than one	341	14.01	55	20.82	56	11.42
One sexual partner	2023	84.21	209	76.39	440	86.40
Missing	39	1.79	7	2.79	11	2.18
HIV Status of Partner						
Positive	170	7.12	68	26.35	97	20.49
Unknown	1475	61.33	109	38.28	288	55.40
Negative	606	25.93	74	28.89	96	19.56
Missing	138	5.62	19	6.48	23	4.55
Syphilis Status						
Positive	143	5.55	19	6.57	39	7.54
Negative	1774	71.21	188	65.58	362	69.45
Missing	486	23.24	64	27.85	106	23.00

Factors Associated with PrEP Awareness among Pregnant PrEP Eligible Women Enrolled in the 2022 ANC Sentinel Survey, South Africa (*N* = 7 271)

Table 3

Factor	%	OR	95% CI	OR	95% CI		
Age (years)							
15–24	33.08	0.95	0.88	1.03	0.95	0.86	1.06
25–49	34.23	1	-	1	-		
Education							
<=Secondary Schooling	31.81	1	-	1	-		
Tertiary schooling	44.29	1.70	1.50	1.93	1.66	1.46	1.89
Ethnicity							
African	36.94	4.94	4.10	5.95	3.41	2.79	4.16
Other	10.60	1	-	1	-		
First ANC visit							
Yes	28.45	0.69	0.62	0.76	0.65	0.59	0.72
No	36.70	1	-	1	-		
HIV testing before pregnancy							
Never	23.13	0.53	0.47	0.60	0.51	0.45	0.59
Yes	36.22	1	-	1	-		
Relationship with father of the baby							
Married/Living together/co-habiting	28.14	0.68	0.62	0.74	0.65	0.59	0.73
Not living together but in a relationship/no relationship	36.67	1	-	1	-		
Multiple sexual partners							
Yes	34.05	1.02	0.88	1.18	1.00	0.86	1.16
No	33.56	1	-	1	-		
HIV Status of Partner							
Positive	57.96	2.21	1.81	2.70	2.21	1.80	2.71
Unknown	29.91	0.68	0.61	0.76	0.70	0.63	0.79
Negative	38.41	1	-	1	-		
Syphilis result							
Positive	35.27	0.97	0.80	1.17	1.03	0.85	1.26
Negative	35.97	1	-	1	-		
Parity							

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Factor	%	OR	95% CI	OR	95% CI	
None	33.77	1.01	0.94	1.10	0.99	1.13
≥ 2	33.45	1	-		1	-
Trimester at 1st ANC Visit						
1	33.83	1.29	1.04	1.59	1.38	1.73
2	33.69	1.28	1.05	1.55	1.28	1.57
3	28.44	1	-		1	-

Factors associated with prior PrEP Coverage among pregnant PrEP Eligible Women enrolled in the 2022 ANC Sentinel Survey, South Africa ($N = 7\,271$)

Factor	%	Crude		Adjusted			
		OR	95% CI	OR	95% CI		
Age (years)							
15–24	3.28	0.83	0.68	1.02	0.84	0.65	1.09
25–49	3.90	1.00	-		1.00	-	
Education							
<=Secondary schooling	3.54	1.00	-		1.00	-	
Tertiary schooling	3.83	1.09	0.84	1.41	1.06	0.81	1.38
Ethnicity							
African	4.10	51.62	9.94	268.01	38.27	7.24	202.32
Other	0.08	1.00	-		1.00	-	
First ANC visit							
Yes	3.43	0.92	0.73	1.15	0.91	0.73	1.15
No	3.73	1.00	-		1.00	-	
HIV testing before pregnancy							
Never	1.05	0.24	0.16	0.36	0.24	0.15	0.36
Yes	4.23	1.00	-		1.00	-	
Relationship with father of the baby							
Married/Living together/cohabiting	2.94	0.74	0.59	0.92	0.65	0.51	0.85
Not living together but in a relationship/no relationship	3.96	1.00	-		1.00	-	
Multiple sexual partners							
Yes	5.31	1.67	1.30	2.13	1.69	1.32	2.17
No	3.25	1.00	-		1.00	-	
HIV Status of Partner							
Positive	23.58	6.34	4.78	8.41	6.45	4.81	8.66
Unknown	2.00	0.42	0.33	0.53	0.41	0.32	0.53
Negative	4.64	1.00	-		1.00	-	
Syphilis result							
Positive	4.43	1.29	0.85	1.97	1.34	0.88	2.05
Negative	3.47	1.00	-		1.00	-	

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Factor	%	Crude		Adjusted			
		OR	95% CI	OR	95% CI		
Parity							
None	3.42	0.91	0.74	1.10	1.02	0.72	1.45
≥ 2	3.76	1	-		1	-	
Trimester at 1st ANC Visit							
1	4.27	1.38	0.84	2.27	1.42	0.86	2.36
2	3.32	1.06	0.66	1.72	1.02	0.63	1.67
3	3.13	1	-	1	1	-	

Table 5

Factors associated with current PrEP Coverage among pregnant PrEP Eligible Women enrolled in the 2022 ANC Sentinel Survey, South Africa ($N = 7271$)

Factor	%	Crude		Adjusted			
		OR	95% CI	OR	95% CI		
Age (years)							
15–24	6.87	1.13	0.98	1.31	1.23	1.01	1.50
25–49	6.12	1.00	-		1.00	-	
Education							
<=Secondary schooling	6.70	1.00	-		1.00	-	
Tertiary schooling	5.24	0.77	0.61	0.98	0.79	0.62	1.01
Ethnicity							
African	7.33	16.58	8.24	33.39	15.32	7.42	31.63
Other	0.47	1.00	-		1.00	-	
First ANC visit							
Yes	5.17	0.70	0.58	0.85	0.69	0.57	0.84
No	7.20	1.00	-		1.00	-	
HIV testing before pregnancy							
Never	7.00	0.58	0.45	0.75	0.56	0.43	0.74
Yes	4.21	1.00	-		1.00	-	
Relationship with father of the baby							
Married/Living together/cohabiting	7.26	0.67	0.56	0.82	0.63	0.51	0.77
Not living together but in a relationship/no relationship	5.02	1.00	-		1.00	-	
Multiple sexual partners							
Yes	5.26	0.78	0.60	1.00	0.76	0.58	0.99
No	6.68	1.00	-		1.00	-	
HIV Status of Partner							
Positive	33.26	8.21	6.27	10.76	8.51	6.43	11.25
Unknown	5.23	0.91	0.73	1.13	0.87	0.70	1.08
Negative	5.72	1.00	-		1.00	-	
Syphilis result							
Positive	9.18	1.42	1.05	1.92	1.46	1.07	2.00

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Factor	%	Crude		Adjusted	
		OR	95% CI	OR	95% CI
Negative Parity	6.66	1.00	-	1.00	-
None	6.47	1.00	0.87	1.14	0.81
≥ 1	6.50	1	-	1	-
Trimester at 1st ANC visit					
1	6.84	1.30	0.89	1.92	0.93
2	6.42	1.22	0.85	1.75	0.84
3	5.33	1	-	1	-