NATIONAL INSTITUTE FOR COMMUNICABLE DISEASES
Division of the National Health Laboratory Service

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Department:
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CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

The 2022 Antenatal Care HIV Sentinel Surveillance: Key Findings

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Disclaimer: the findings and conclusions in this report are those of the author(s) and do not necessarily represent the official position of the Centers for Disease Control and Prevention (CDC).

Outline

- History of the ANC survey
- Objectives
- Methods
- Findings
- Discussion

BACKGROUND

History of the ANC Survey

- Done annually since 1990 - 2015
- Measured HIV and syphilis prevalence nationally and by province.
- Previously, one or two surveys measured herpes simplex sero-prevalence
- In 2006, survey expanded to provide district level estimates
- HIV prevalence was flat for more than a decade (2005 - 2019) and syphilis seropositivity was low/declining
- Utility of survey was questioned especially with delays in getting results
- Review of survey conducted 2015 - 2016

History of the ANC Survey

Changes made since the 2015 survey:

- Survey to include first visit and follow-up attendees (2015)
- That NICD coordinates/conducts the survey (2017)
- Survey to be conducted every two years and measure syphilis prevalence and process indicators every 2 - 4 years (2017)
- Broaden objectives to include evaluation of the first three pillars of the PMTCT programme (2017)
  - Pillar 1 – prevent new infections among women of reproductive age (**estimating HIV incidence**)
  - Pillar 2 – prevent unintended pregnancy among WLHIV (**estimating unintended pregnancy**)
  - Pillar 3 – prevent/eliminate vertical transmission through HIV testing, ART initiation and viral suppression among pregnant women (**describe the care cascade**)
- Use the survey to evaluate "performance" of routine PMTCT programme data and consider using routine data if quality is acceptable (2017)

Objectives of the 2022 Edition of the Survey

Primary objectives:

- To determine the geographical distribution and pattern of HIV sero-prevalence among pregnant women aged 15- 49 years attending public ANC clinics in South Africa at national, provincial and district level

- 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 a national and provincial level
  (b) 15–24 years old, at a national level

Objectives of the 2022 Edition of the Survey

Secondary objectives:

- To determine what proportion of HIV-positive pregnant women (15–49 years old) attending ANC clinics know their HIV status (1st 95)
- To determine what proportion of known HIV–positive pregnant women (15–49 years old) are receiving ART (2nd 95) and taking DTG-based regimens
- 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 PrEP during ANC (PrEP eligible).
- To estimate the coverage of PrEP among HIV negative pregnant women during/ before pregnancy
- To determine the prevalence of early (≤12 weeks) ANC attendance among pregnant women (15–49 years old) attending ANC clinics
- To estimate incidence of HIV among pregnant women

METHODS

Design

- Cross-sectional survey at selected and designated sentinel sites
- Initial selection
  - Multistage stratified cluster sampling design was used to select sentinel sites
  - All nine provinces and 52 districts were selected
  - Eligible clinics were identified and allocated to each of the six strata
  - These strata are based on geo-location (rural/urban/ peri-urban) and size (large, medium and small using district antenatal visit volume data as proxy measure for size)
  - Facilities within each strata selected according to PPS method
  - Equal sample sizes allocated to facilities in each stratum
  - Sample size calculated at district level such that district HIV prevalence is measured with 3-5% precision assuming 95% confidence interval, 80% power, design effect of 1.5 and 10% attrition of samples (for loss of specimens and data collection forms, incomplete reporting)

PPS: Probability Proportional to Size

Facility Eligibility Criteria (confirmed at every survey)

- Public facilities providing pregnancy testing and ANC services
- Have a minimum of 20 first–ANC–visit attendees per month in previous year (DHIS)
- Routinely draw blood from ANC–clients, with capacity to store sera at 4 degrees Celsius
- Be able to transport biological specimens to the nearest regional laboratory within 24 hours
- Facility staff had to be willing and able to conduct the survey

Eligibility Criteria for Pregnant Women

Inclusion criteria:

- Aged 15–49 years
- Attending the antenatal clinic either for the first time or for follow–up visits
- Willing and able to consent

Exclusion criteria:

- Previously visited the clinic during the survey period
- Pregnant women aged <15 years or ≥50 years
- Women who refused to participate in the survey

Data Collection

- Questionnaire plus record review and abstraction and specimen collection

Data source	Variables
Medical record review	• Province, district, health facility • Date of specimen collection • Age of the woman • Visit type, and gestational age • 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	• 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 - PrEP eligibility criteria - (>1 sexual partner in the past 12 months, partner HIV positive/status unknown, sex under the influence of drugs/alcohol in the past 6 months, having an STI or being treated for an STI in the past 6 months)** • **Ever heard of PrEP, PrEP use prior to pregnancy and current PrEP use**

Laboratory Testing

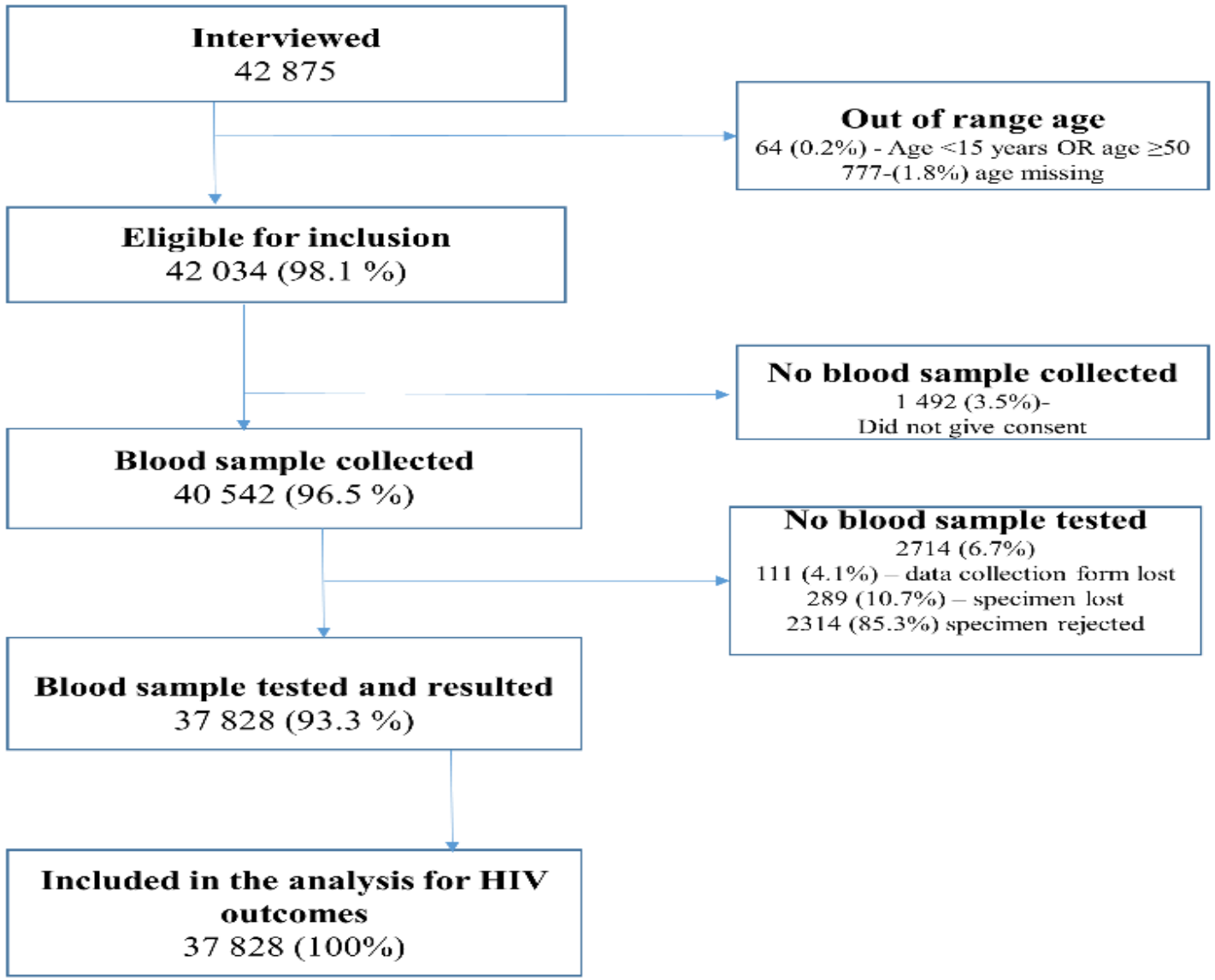
- HIV testing – 4th generation enzyme immunoassays
  - Previously processed and tested at regional laboratories
  - 22 edition: all testing occurred at NICD
- Viral load testing
- LAg assay for HIV incidence estimation
- ARV exposure

Data Management and Analysis

- Completed forms were sent to regional laboratories with specimens
- Scanned using OMR to SQL database
- Data exported into Stata for cleaning and analysis
- Analysis weighted to mid-year population estimates for women of reproductive age
- Finite population correction applied to adjust for sampling facilities without replacement

RESULTS

Results – Study Flow



Sample Size Realization by Province

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**

Data unweighted

Characteristics of Survey Participants (N=37 828)

Variable	N	n(%)
Age in years (median, IQR)	37,828	26 (22 - 32)*
Age ≤ 24 years	37,828	14,958 (39.5)
Black African ethnicity	37,717	33,233 (88.1)
Completed secondary school or further	36,865	33,284 (90.3)
Single and not-cohabiting relationship with father	37,541	22,285 (59.4)
Father's age ≥ 5 years	35,635	14,711 (41.3)
Parity (median, IQR)	37,202	2 (1- 3)
Gravidity	36,709	2 (1- 3)
Attending 1st ANC visit	36,957	11,241 (30.4)

Data unweighted

Age Distribution of Participants Over Time

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**

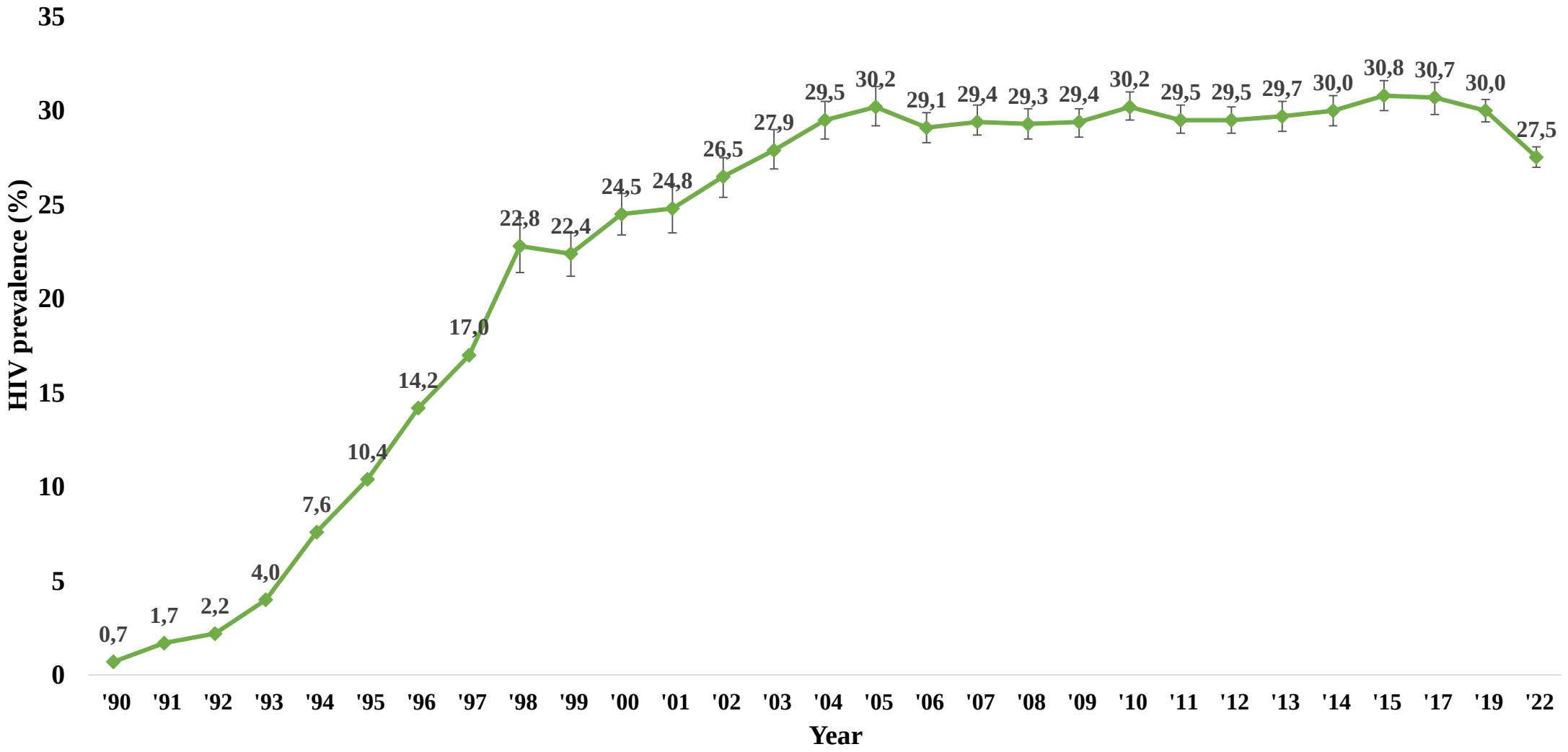
*Total excludes missing age data (in 2017, 2019 and 2022, age data were missing for 8.2%, 7.6% and 1.8% of participants, respectively). Data unweighted

Distribution of First Visits vs. Follow Up Visits

Province	1st 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**

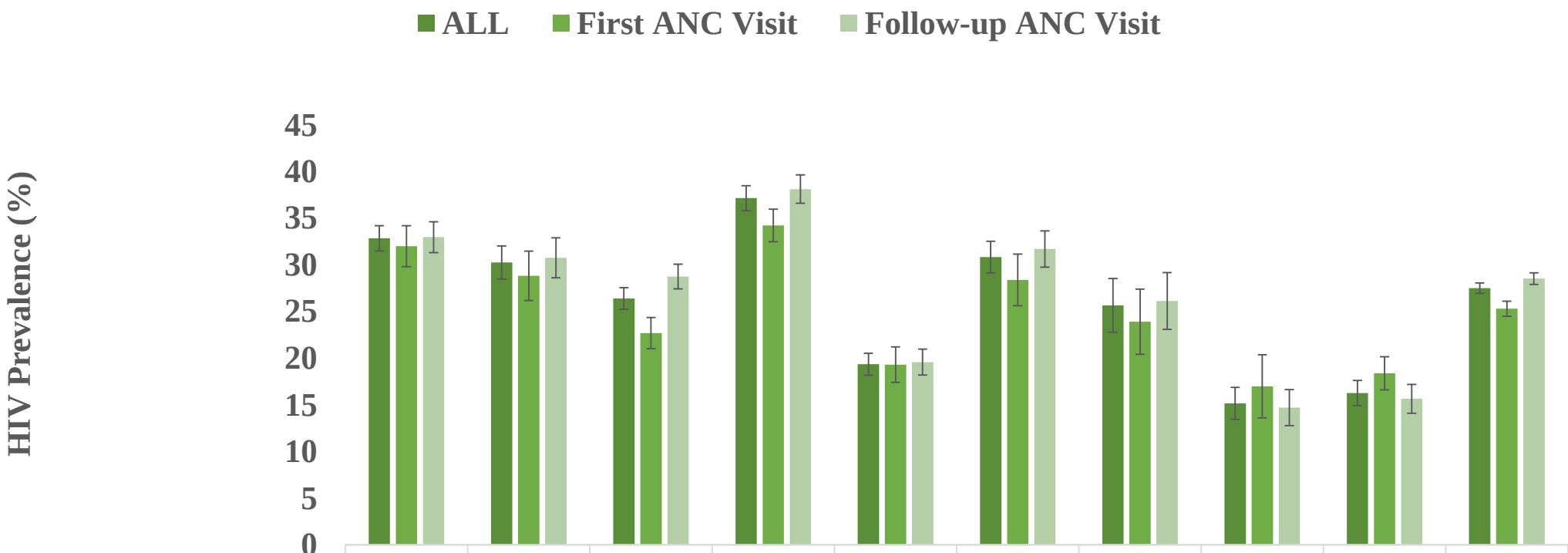
Data unweighted

HIV Prevalence at National Level



Data weighted

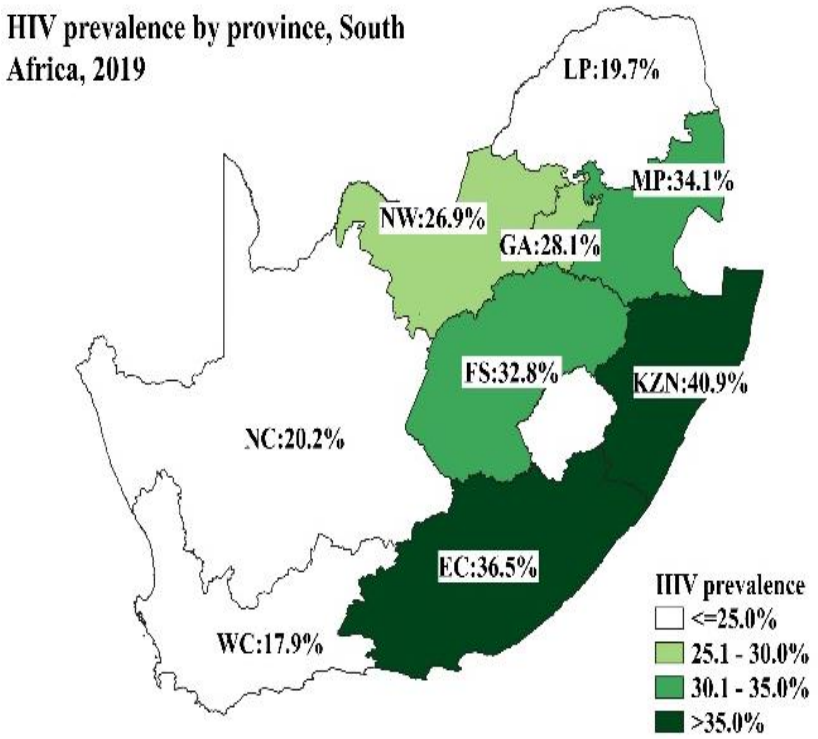
HIV Prevalence by Province and ANC Visit Status

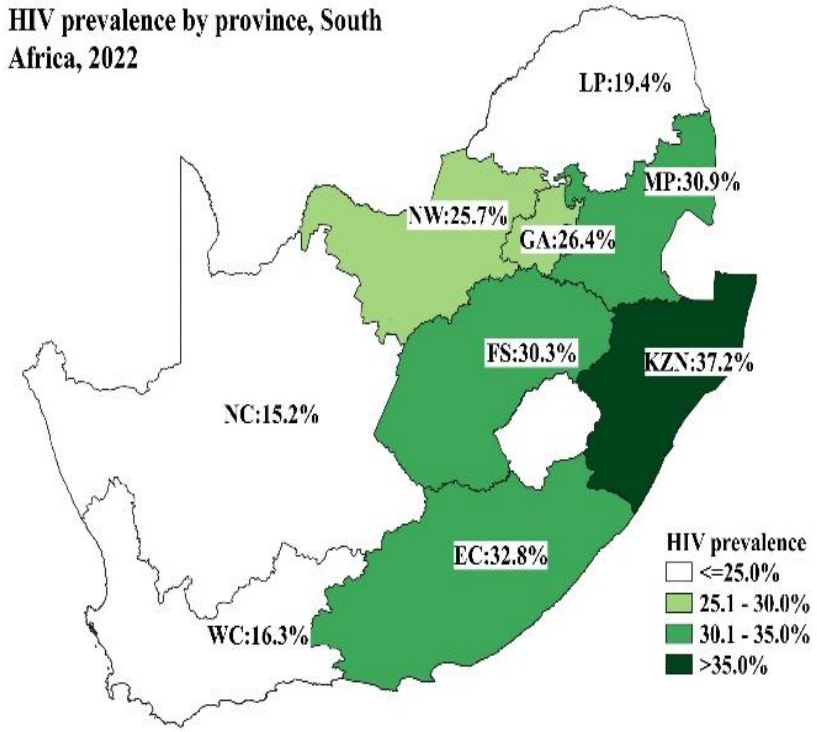


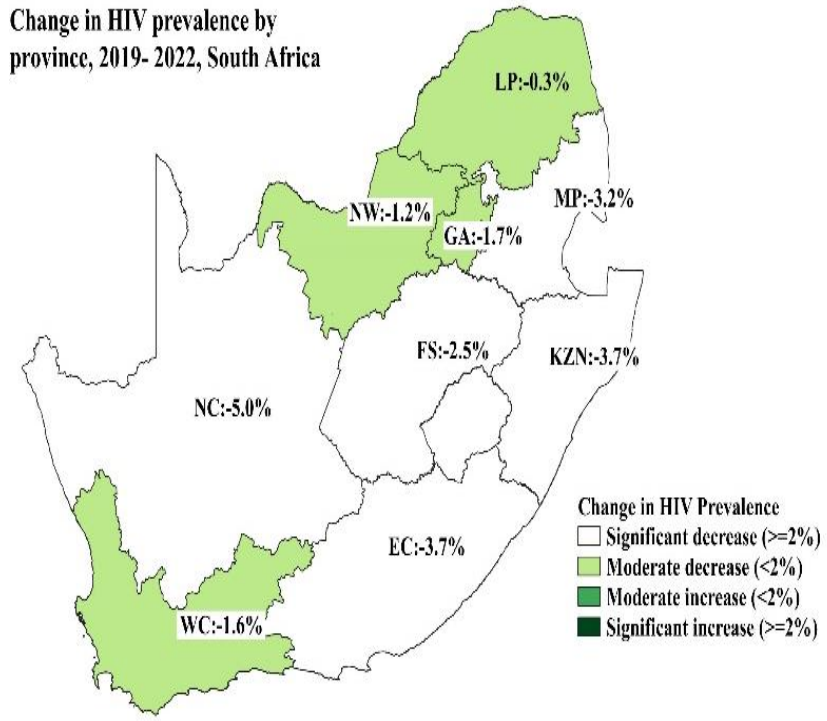
	EC	FS	GA	KZN	LP	MP	NW	NC	WC	SA
ALL	32,9	30,3	26,4	37,2	19,4	30,8	25,7	15,2	16,3	27,5
First ANC Visit	32,0	28,8	22,7	34,2	19,3	28,4	23,9	17,0	18,4	25,3
Follow-up ANC Visit	33,0	30,8	28,8	38,1	19,6	31,7	26,1	14,7	15,7	28,5

Data weighted

HIV Prevalence Trends Over Time (2019 vs. 2022)

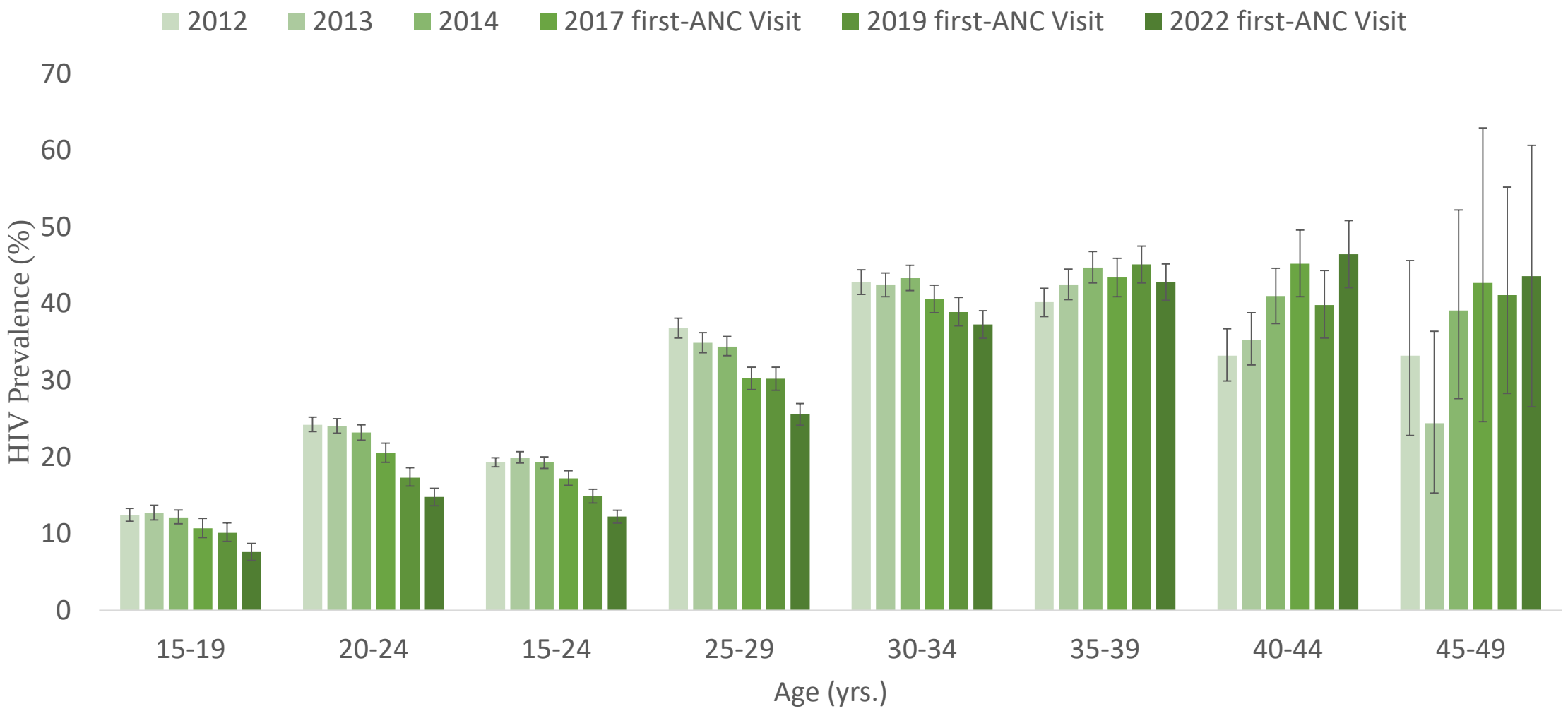






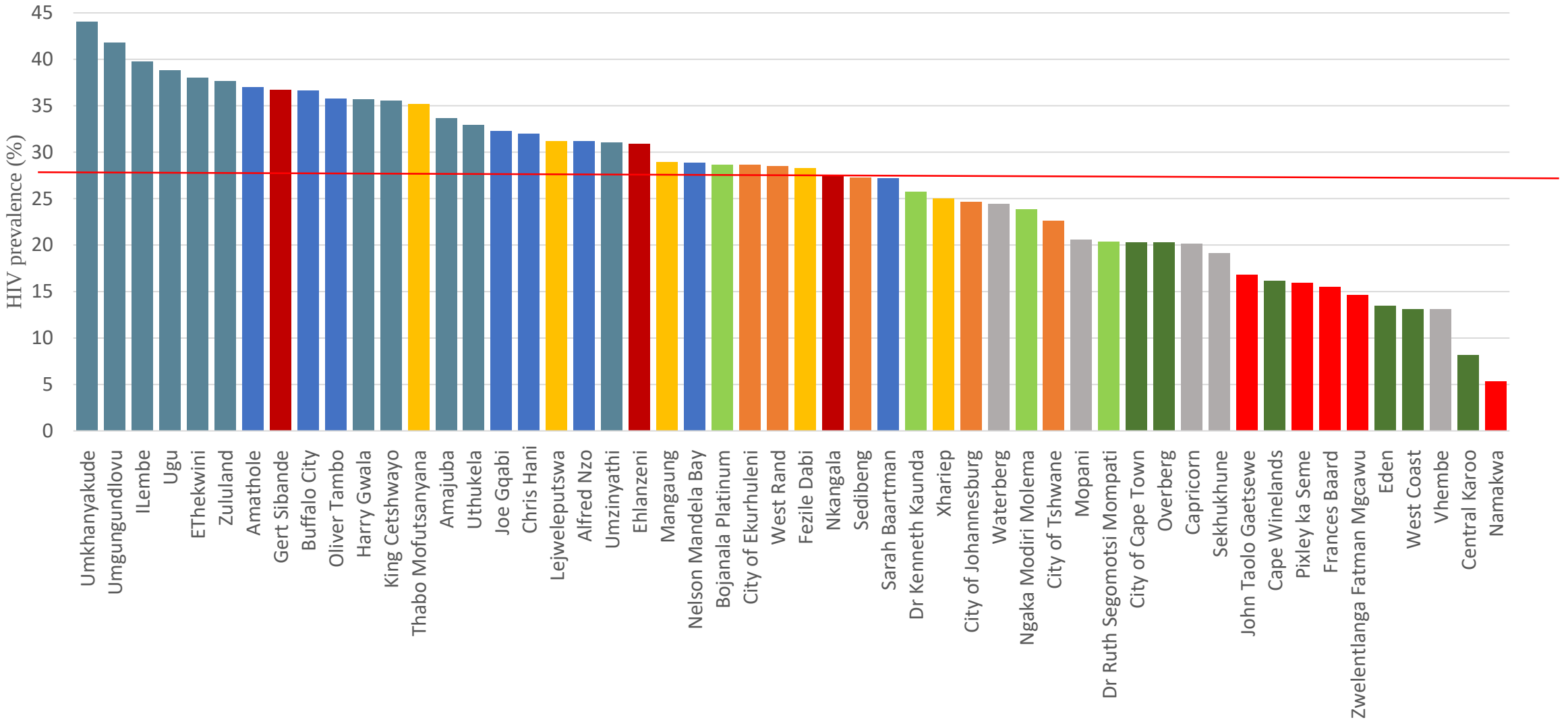
Data weighted

HIV Prevalence by Age and Year among First Visit Attendees



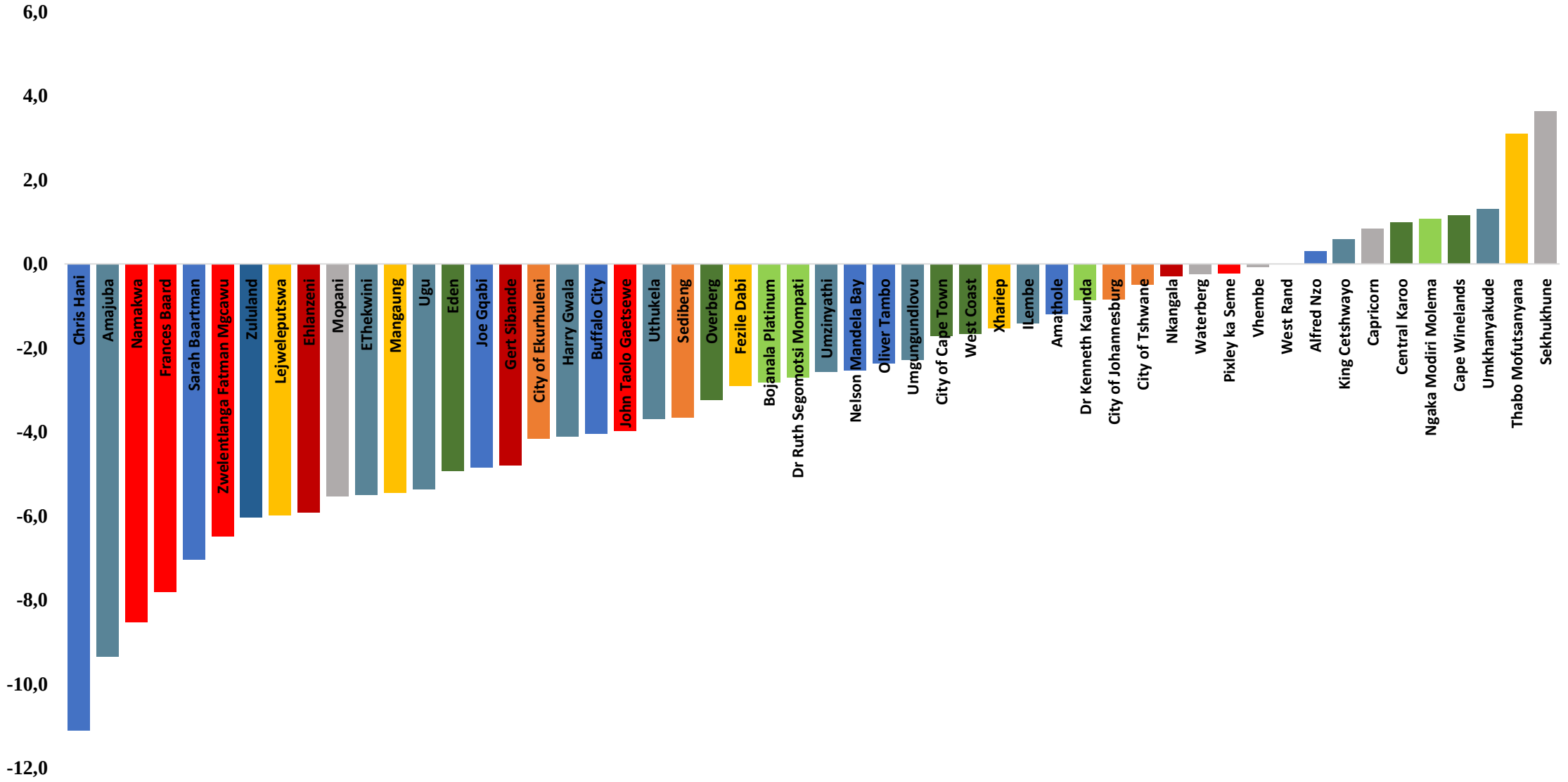
Data weighted

HIV Prevalence by District



Data weighted. 27 districts had prevalence about national estimate

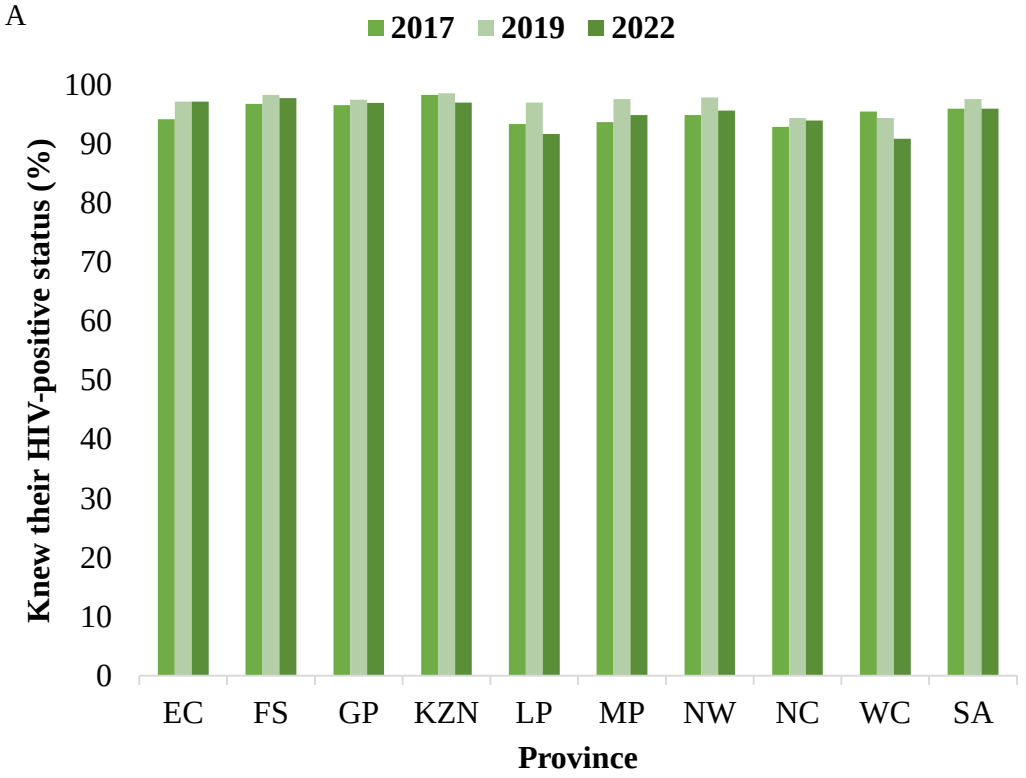
Change in HIV Prevalence by District (2019 vs. 2022)



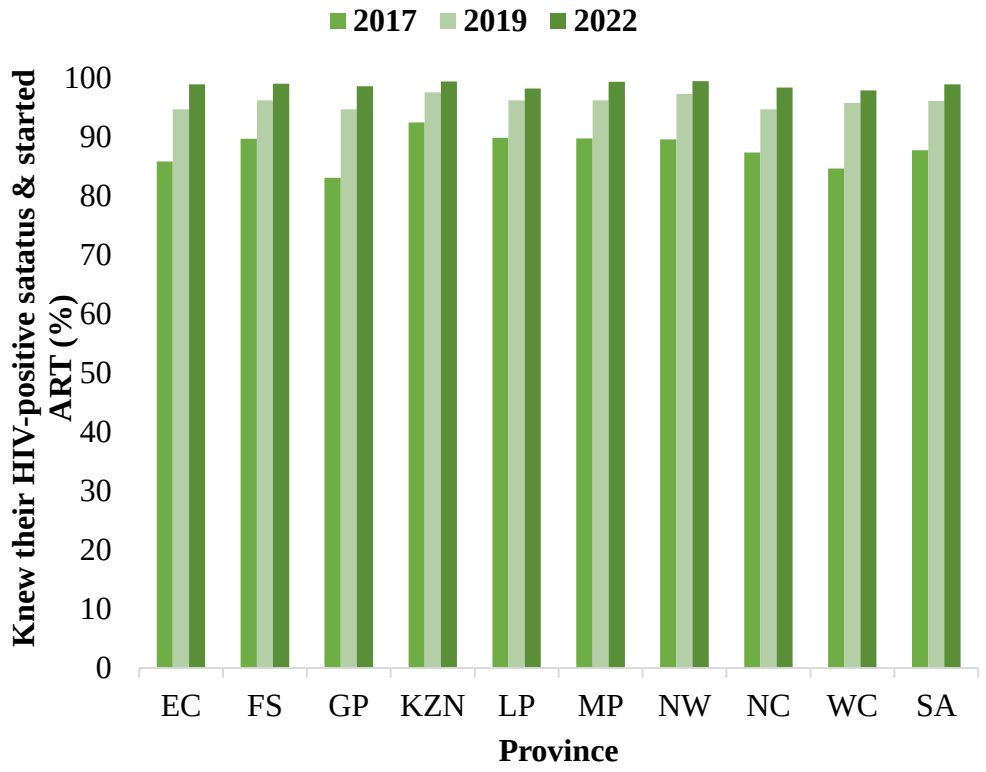
Data weighted. 9 districts had increase in prevalence compared to 2019 estimates

1st and 2nd 95 by Province and Year

A



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

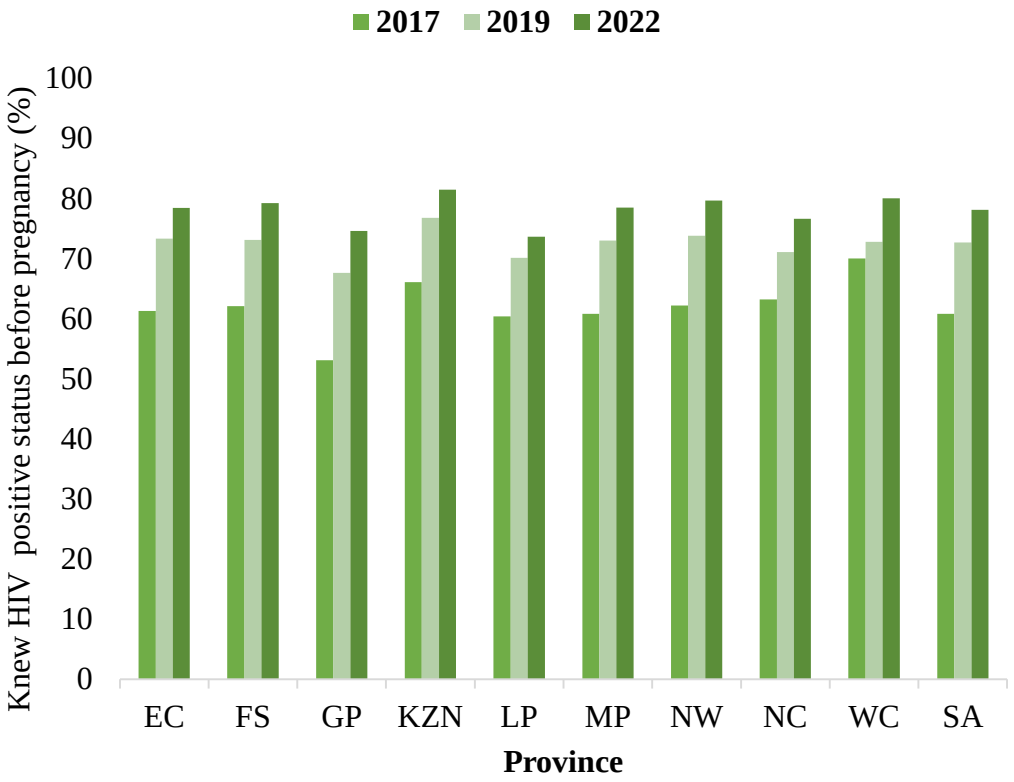


The denominator was the total number of women who knew their HIV–positive status. Missing data excluded. ART: Antiretroviral therapy.

Data weighted.

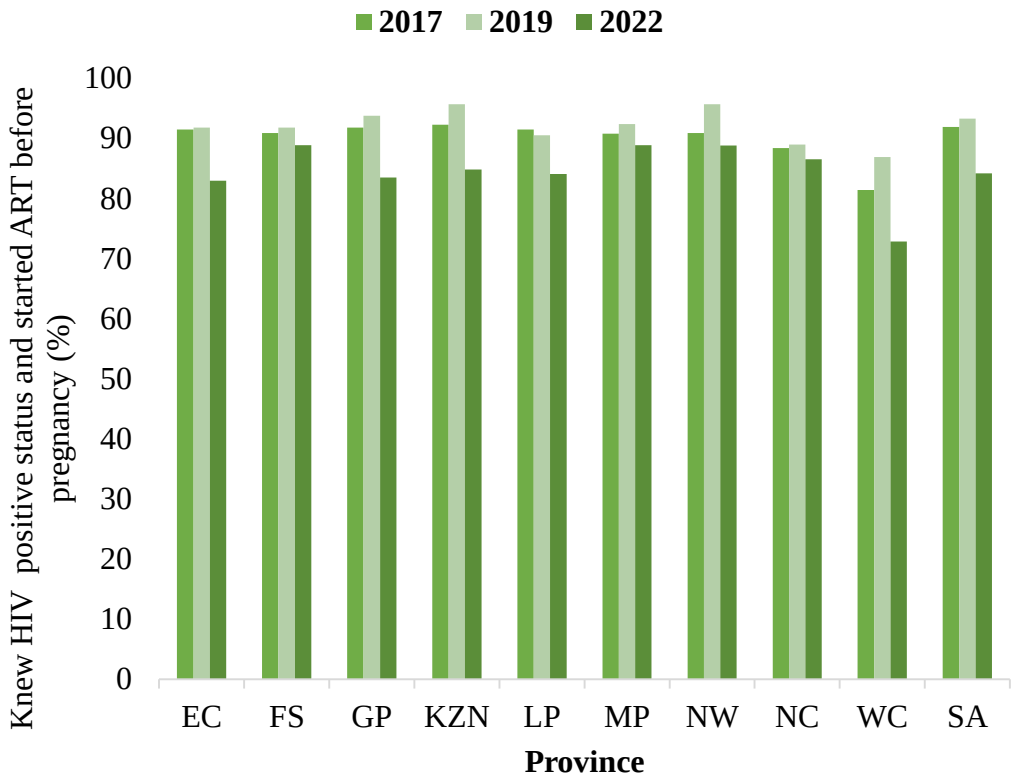
1st and 2nd 95 Prior to Pregnancy by Province and Year

A



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

B

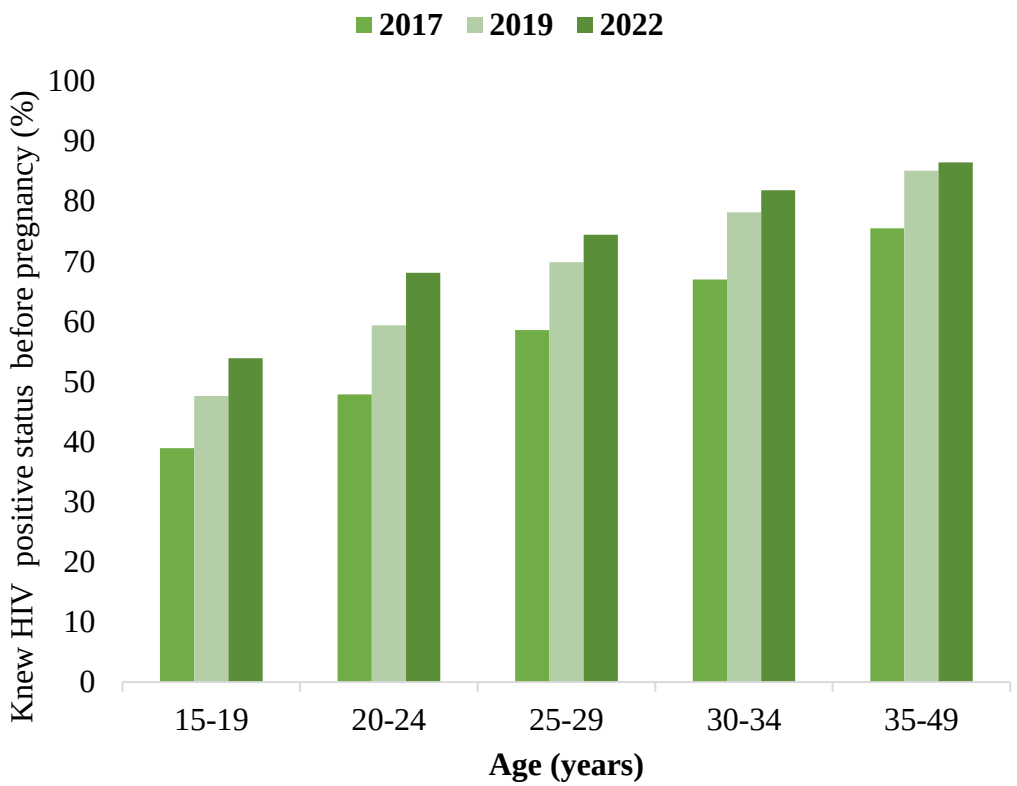


ART: antiretroviral therapy. The denominator for ART initiation before pregnancy was the number of HIV–positive women who were aware of their HIV–positive status before pregnancy. Missing data excluded.

Data weighted.

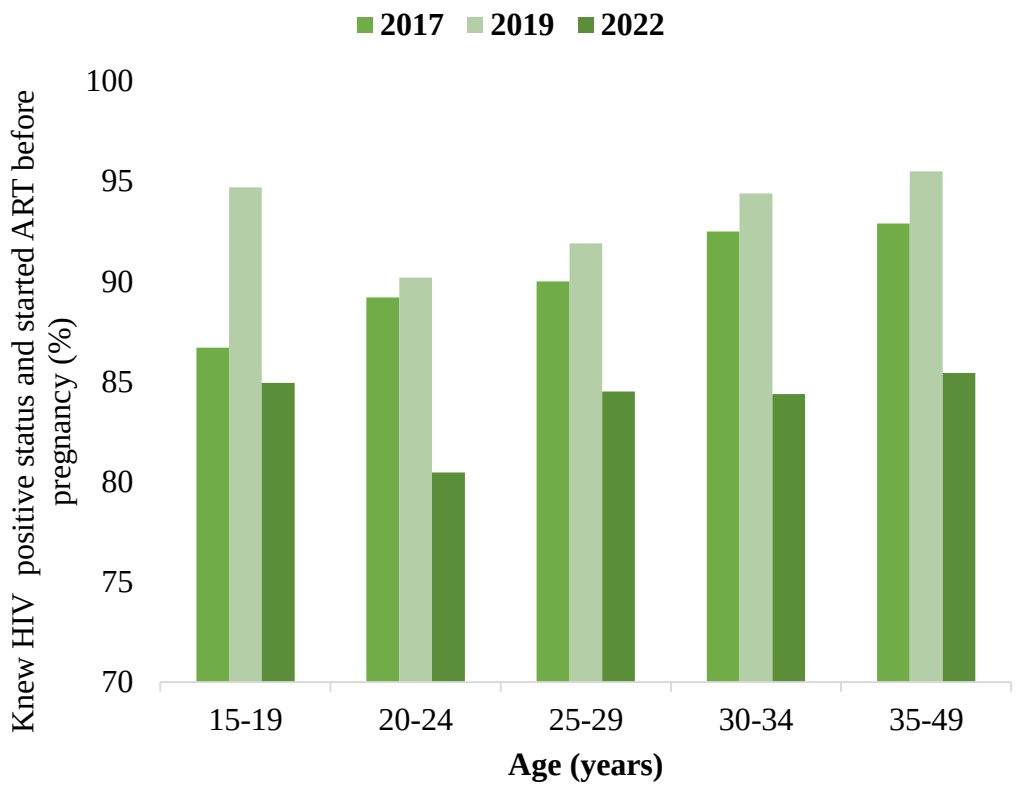
1st and 2nd 95 Prior to Pregnancy by Age

A



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

B

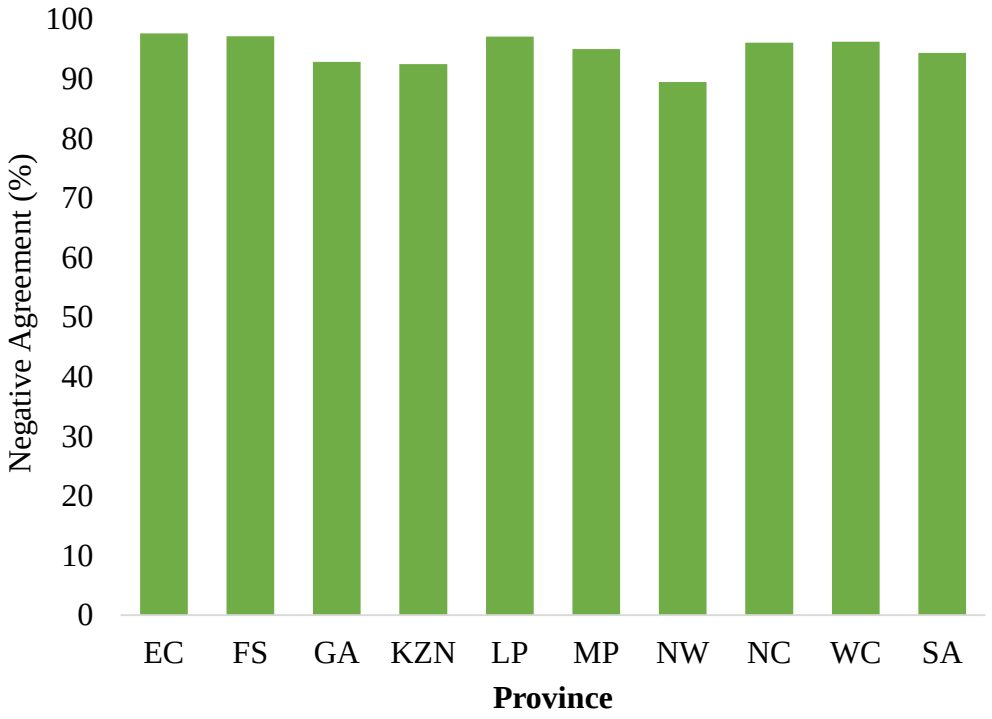


ART: antiretroviral therapy. The denominator for ART initiation before pregnancy was the number of HIV–positive women who were aware of their HIV–positive status before pregnancy. Missing data excluded.

Data weighted.

Percent Positive & Negative Agreement between Facility vs. Laboratory Testing by Province

A



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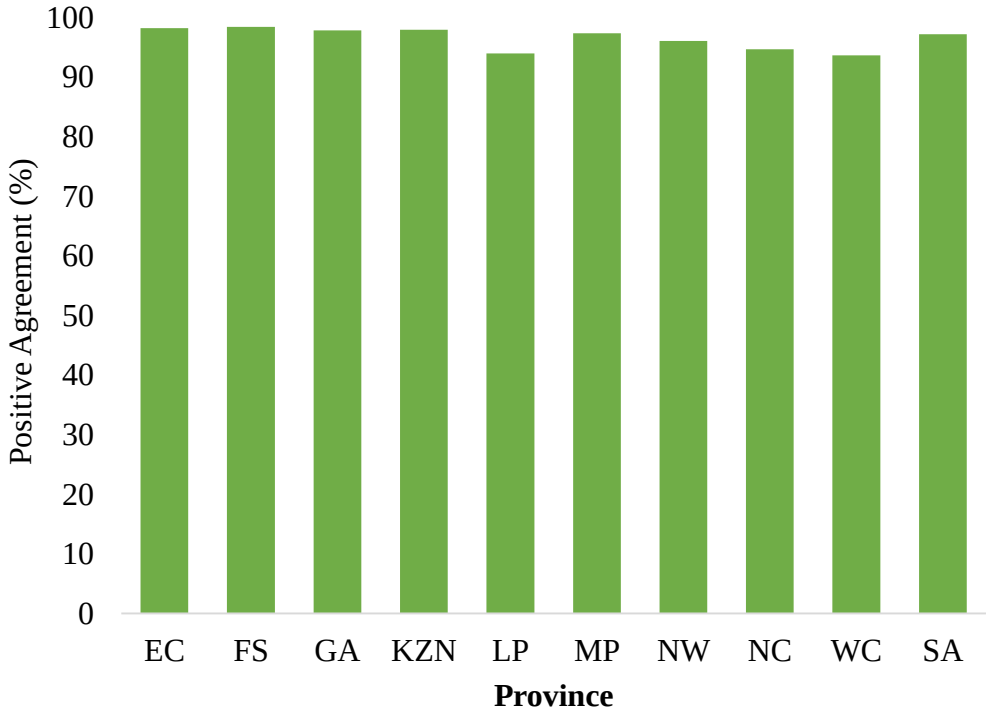
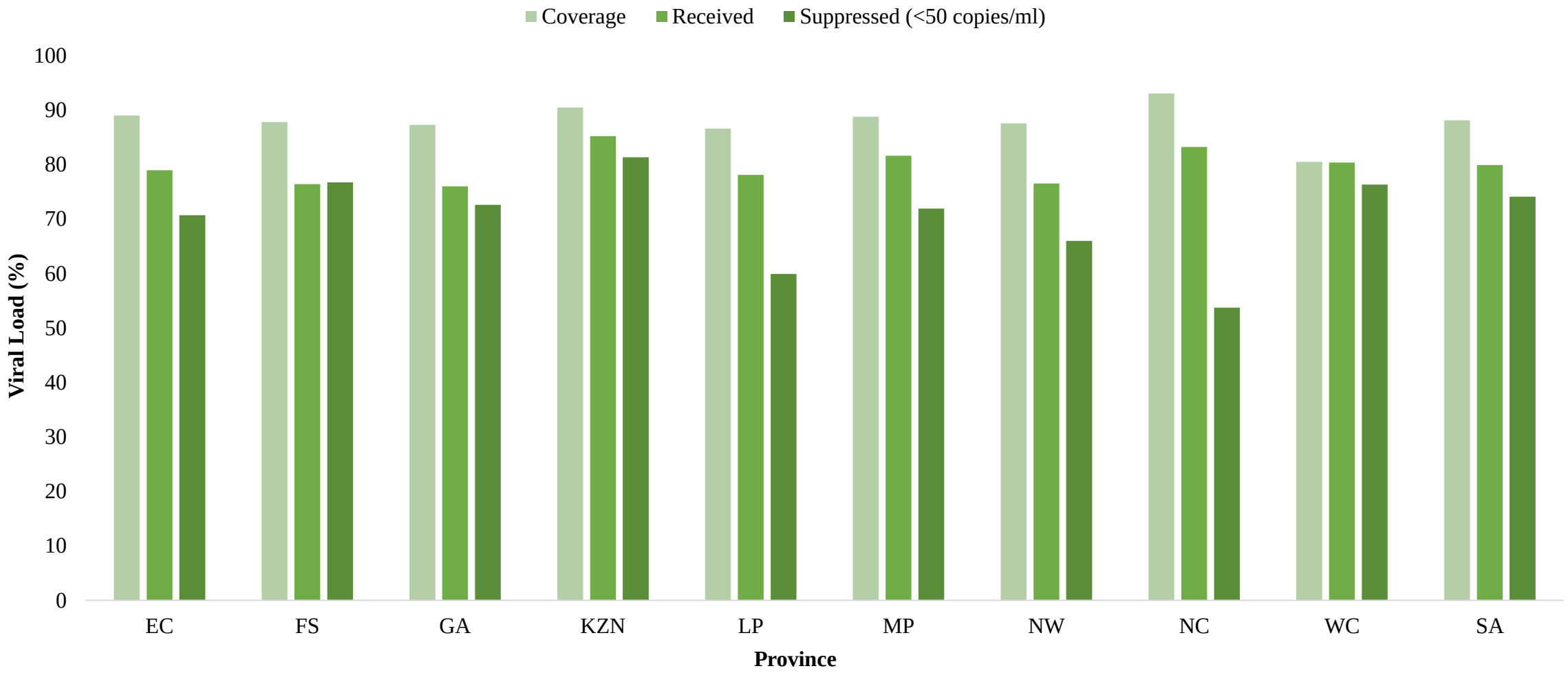


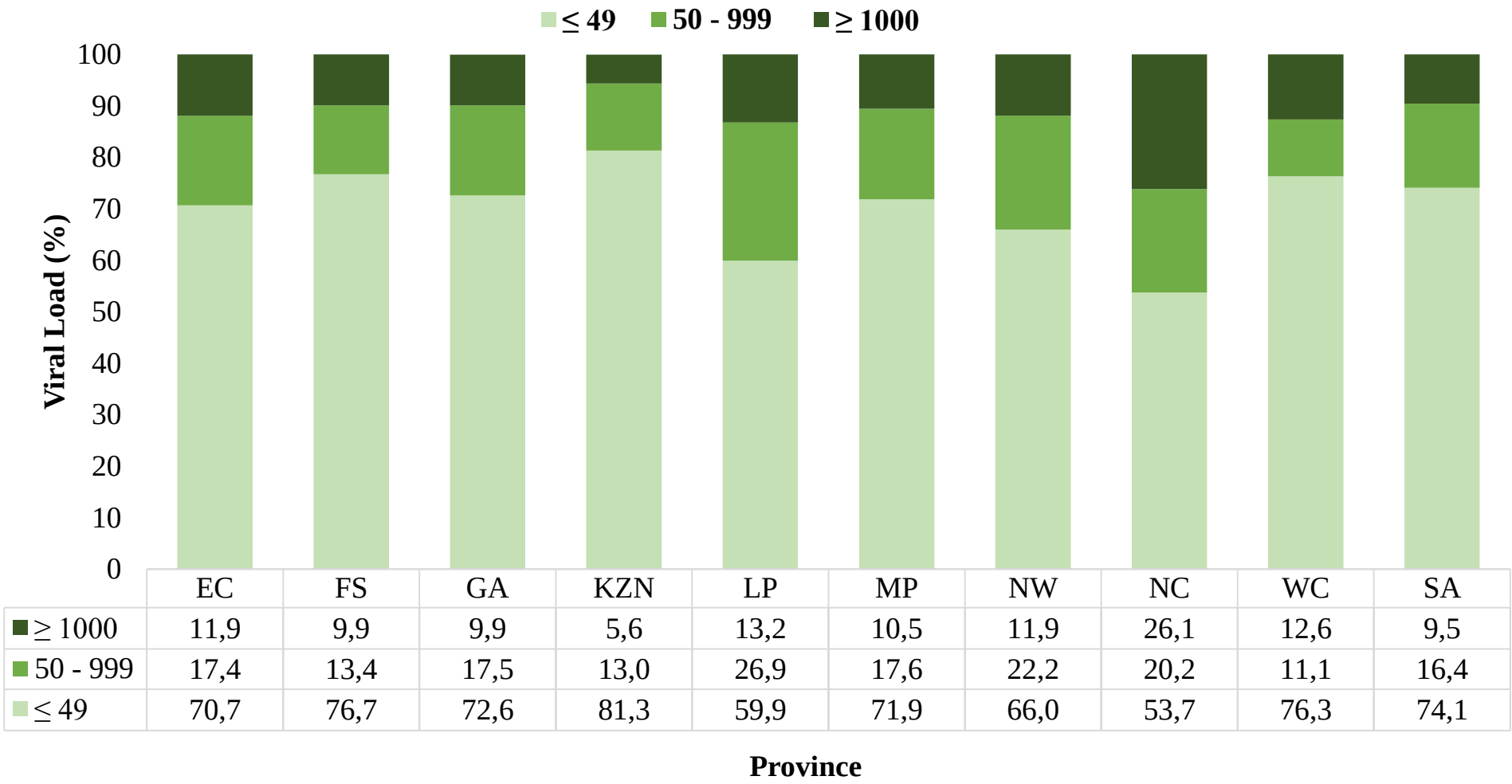
Data weighted.

Viral Load Coverage, Receipt of Results and Suppression (by Record Review and among Eligible)



Data weighted.

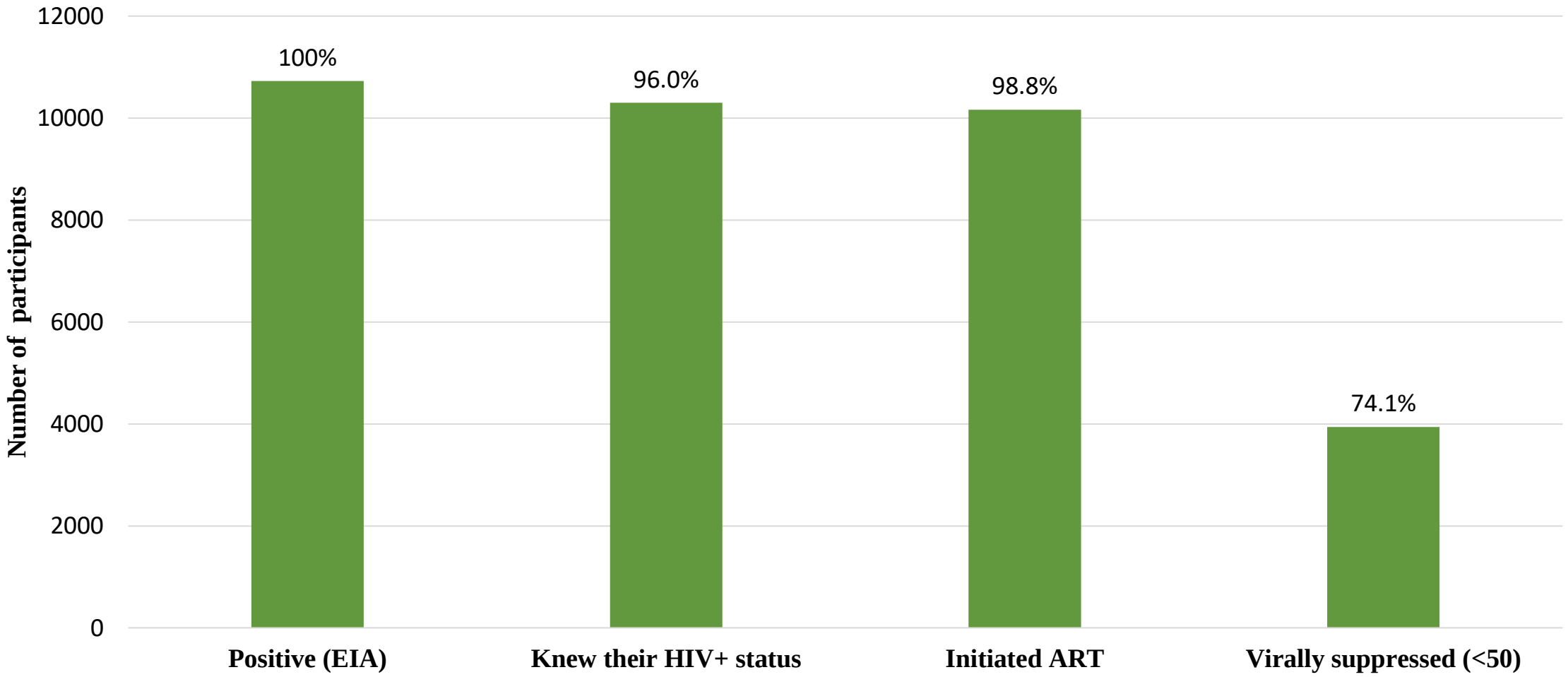
Distribution of Viral Load Results by Province (Record Review)



	EC	FS	GA	KZN	LP	MP	NW	NC	WC	SA
≥ 1000	11,9	9,9	9,9	5,6	13,2	10,5	11,9	26,1	12,6	9,5
50 - 999	17,4	13,4	17,5	13,0	26,9	17,6	22,2	20,2	11,1	16,4
≤ 49	70,7	76,7	72,6	81,3	59,9	71,9	66,0	53,7	76,3	74,1

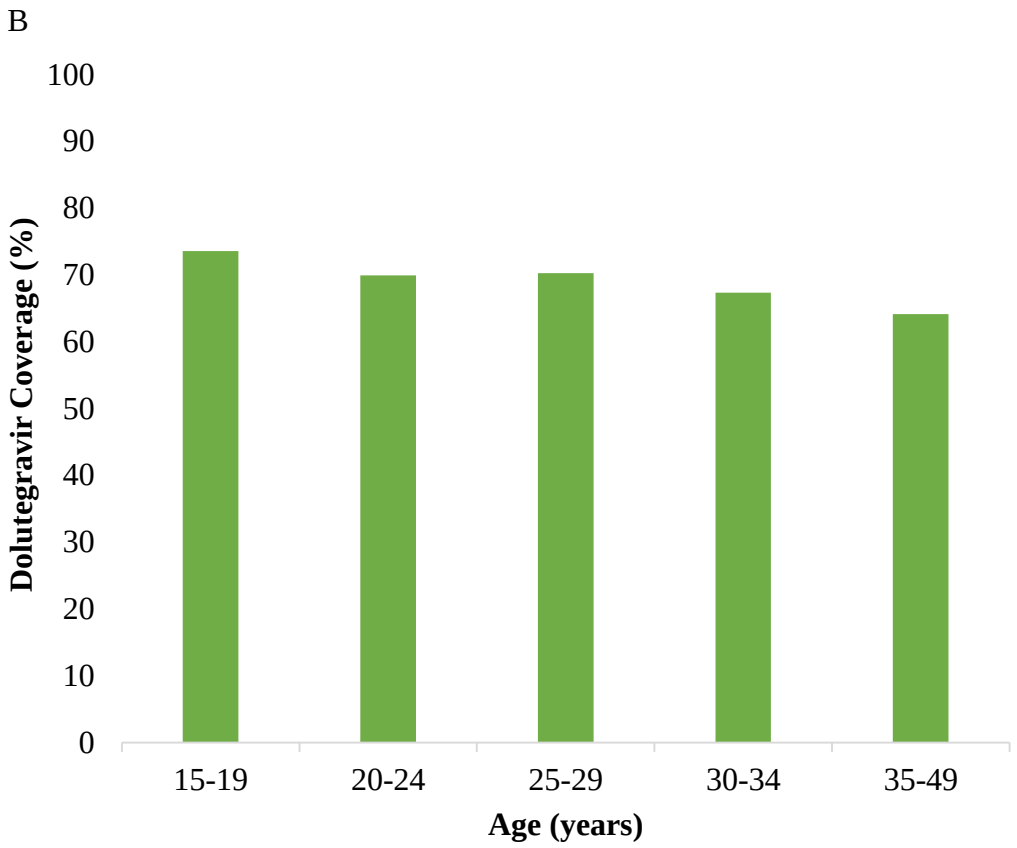
Data weighted.

95-95-95 HIV Care Cascade



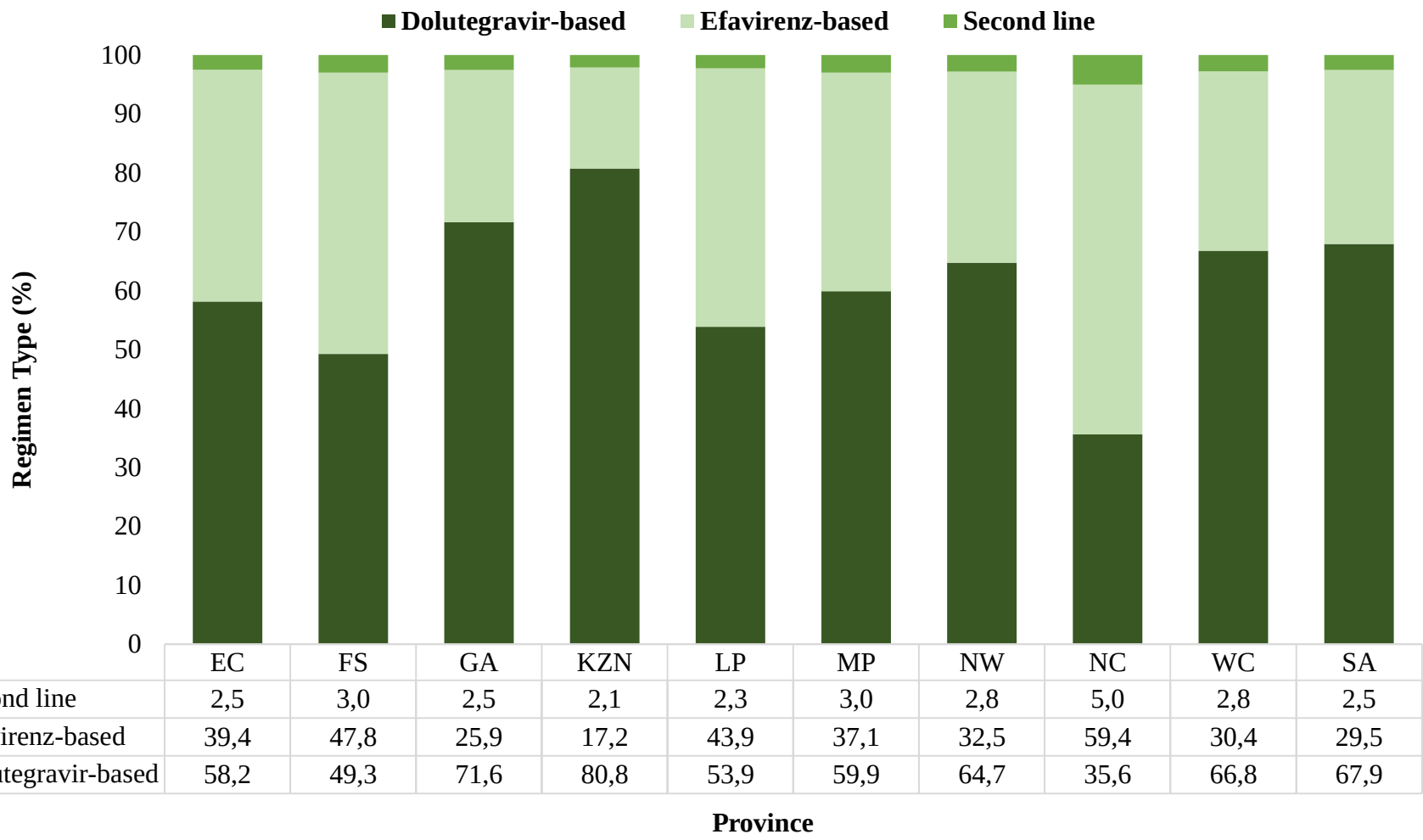
Data weighted.

DTG Coverage among those on ART by Province and Age



Data weighted.

ART Regimen Type Coverage by Province

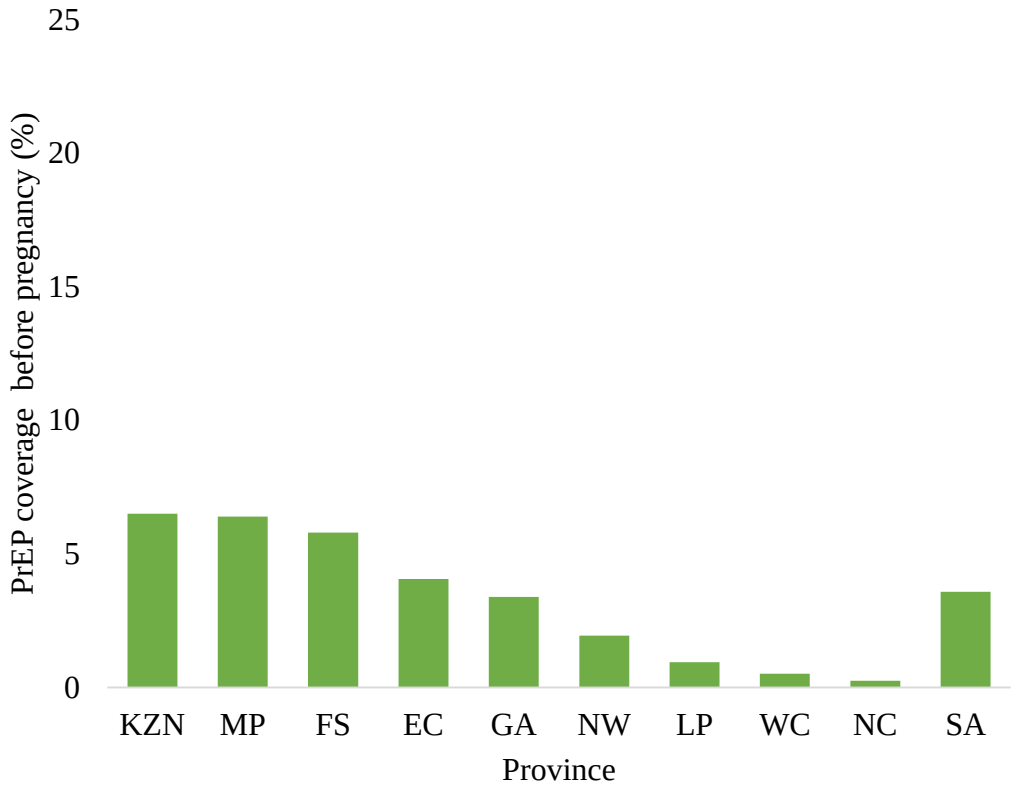


	EC	FS	GA	KZN	LP	MP	NW	NC	WC	SA
Second line	2,5	3,0	2,5	2,1	2,3	3,0	2,8	5,0	2,8	2,5
Efavirenz-based	39,4	47,8	25,9	17,2	43,9	37,1	32,5	59,4	30,4	29,5
Dolutegravir-based	58,2	49,3	71,6	80,8	53,9	59,9	64,7	35,6	66,8	67,9

Data weighted.

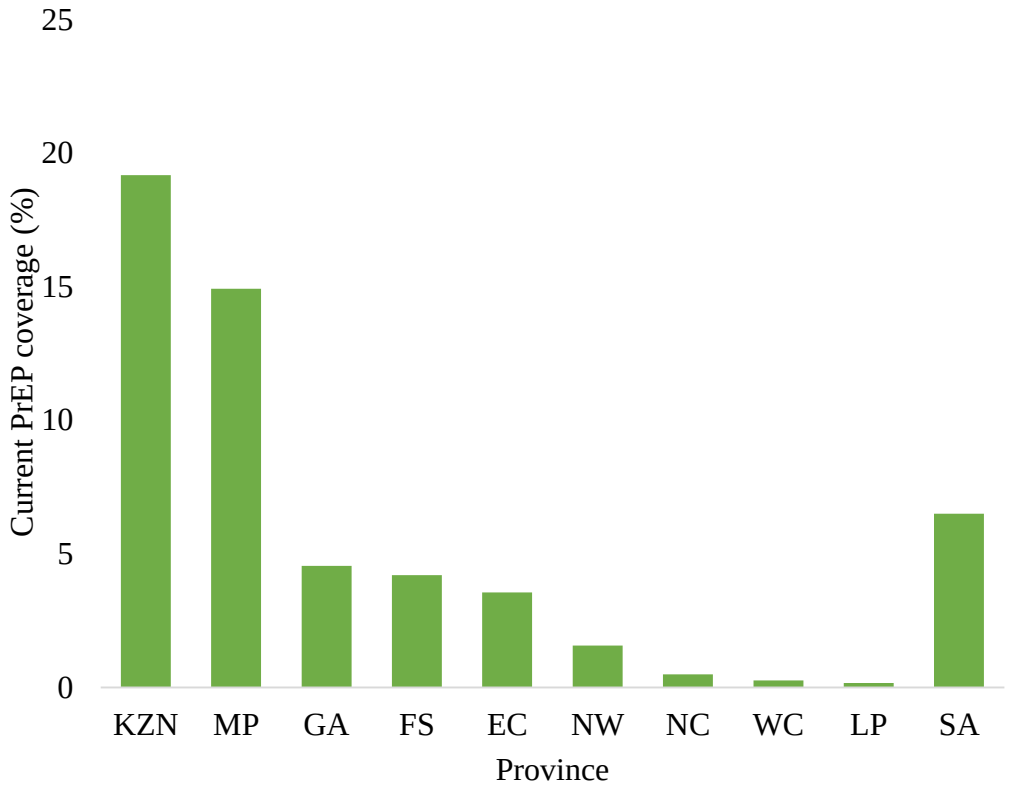
PrEP Coverage Before/During Pregnancy by Province

A



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

B

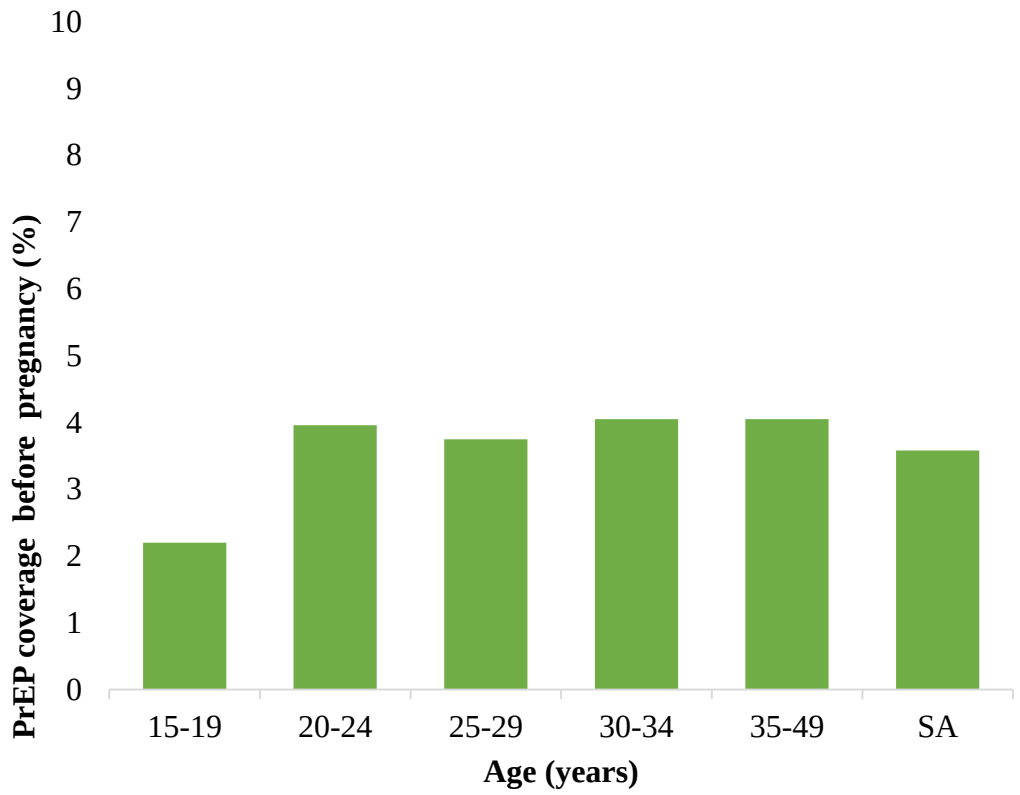


The denominator for PrEP coverage during current pregnancy was the number of HIV negative women who met the PrEP eligibility criteria. Missing data excluded.

Data weighted.

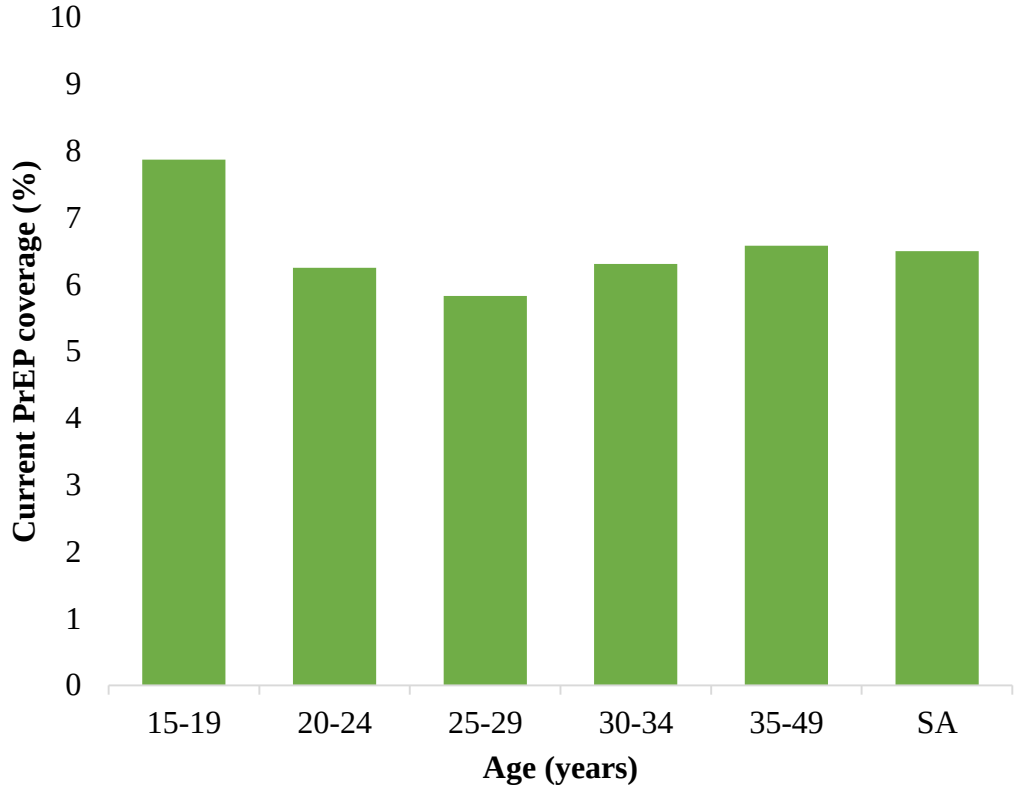
PrEP Coverage Before/During Pregnancy by Age

A



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

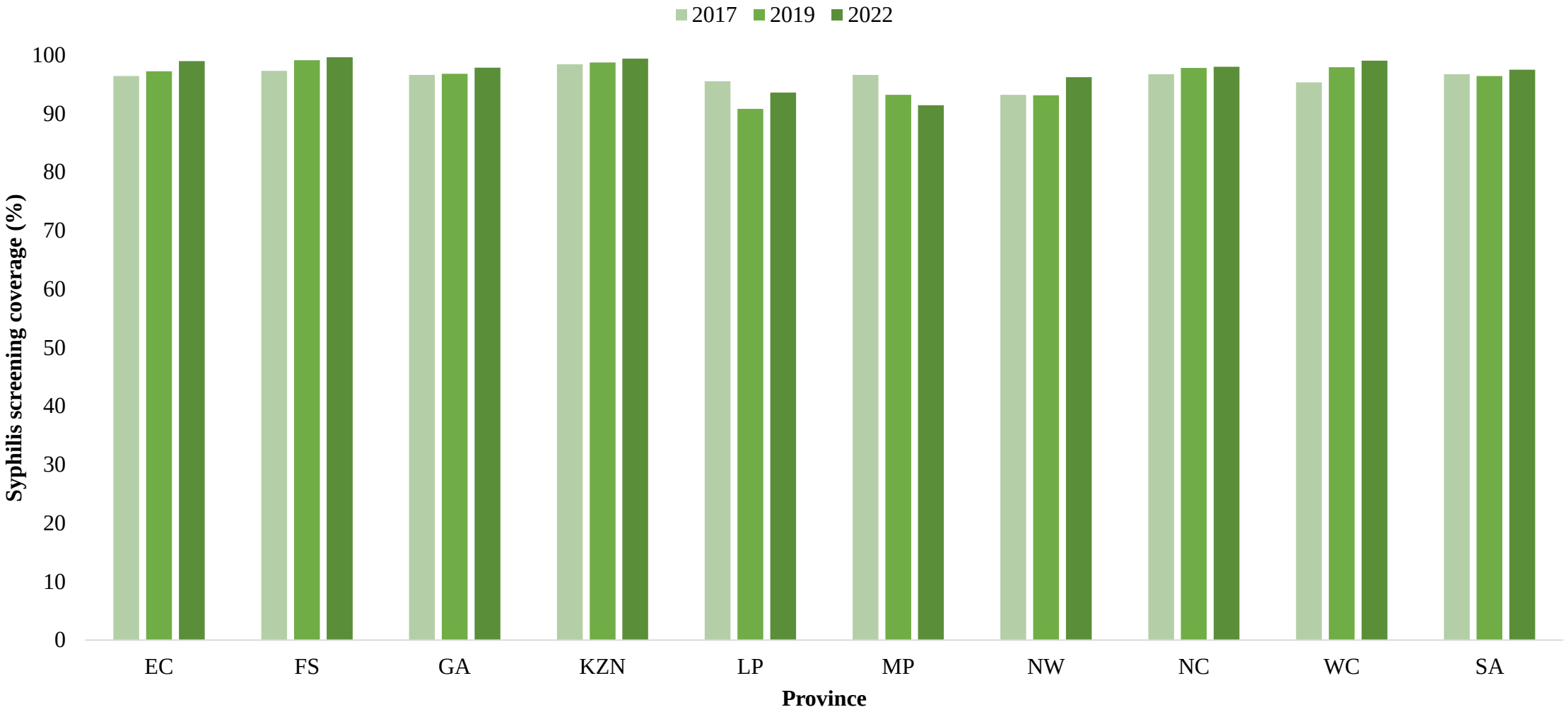
B



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

Data weighted.

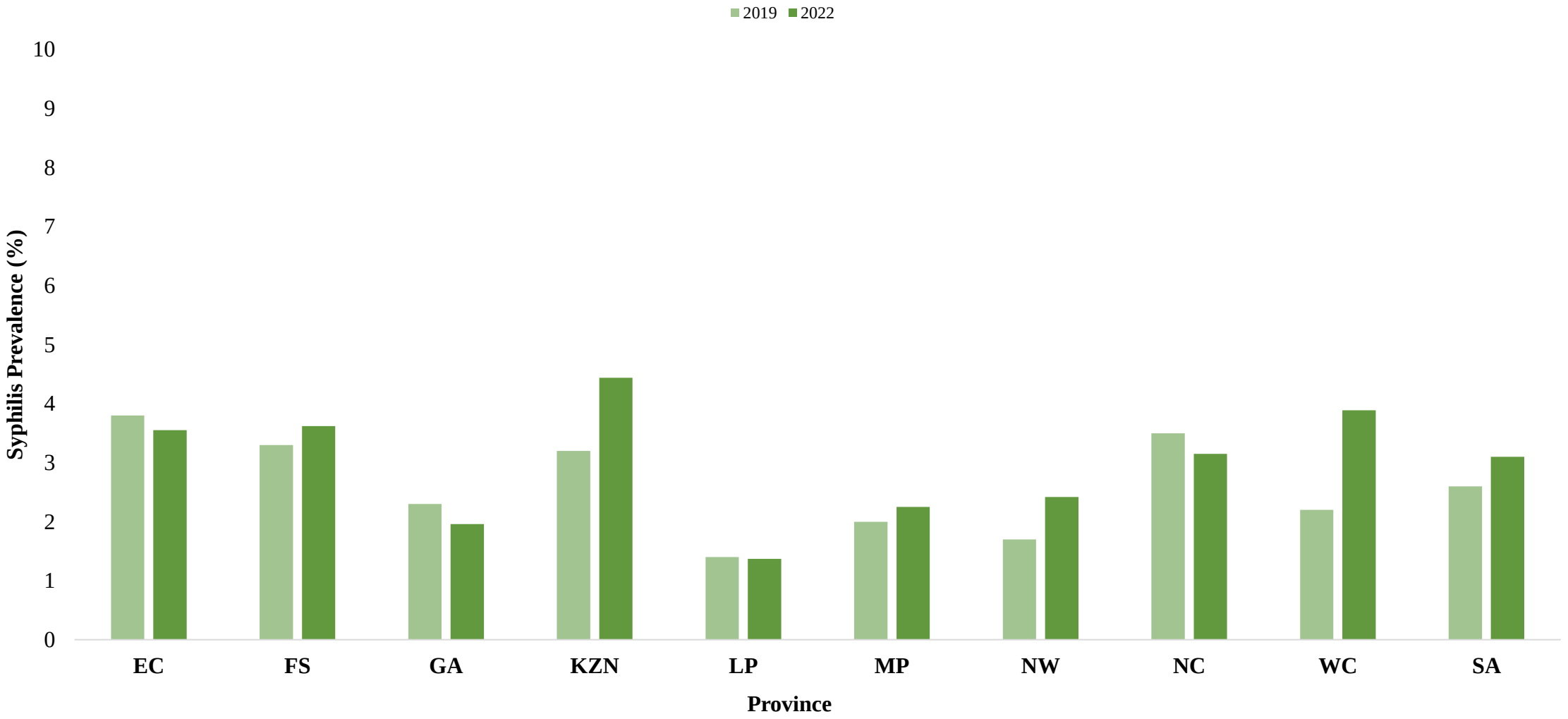
Maternal Syphilis Screening by Province and Year



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

Data weighted.

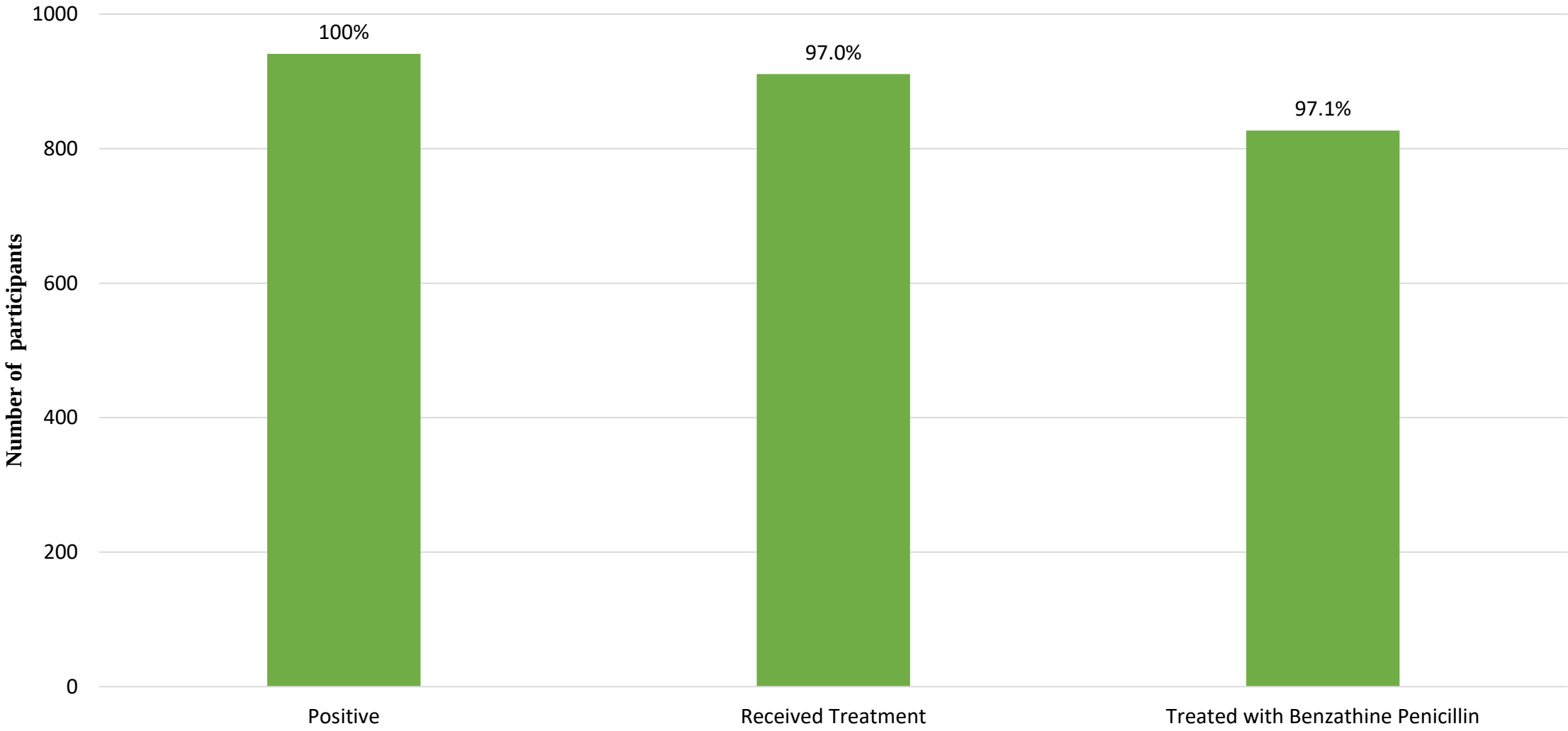
Maternal Syphilis Sero-prevalence by Province



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

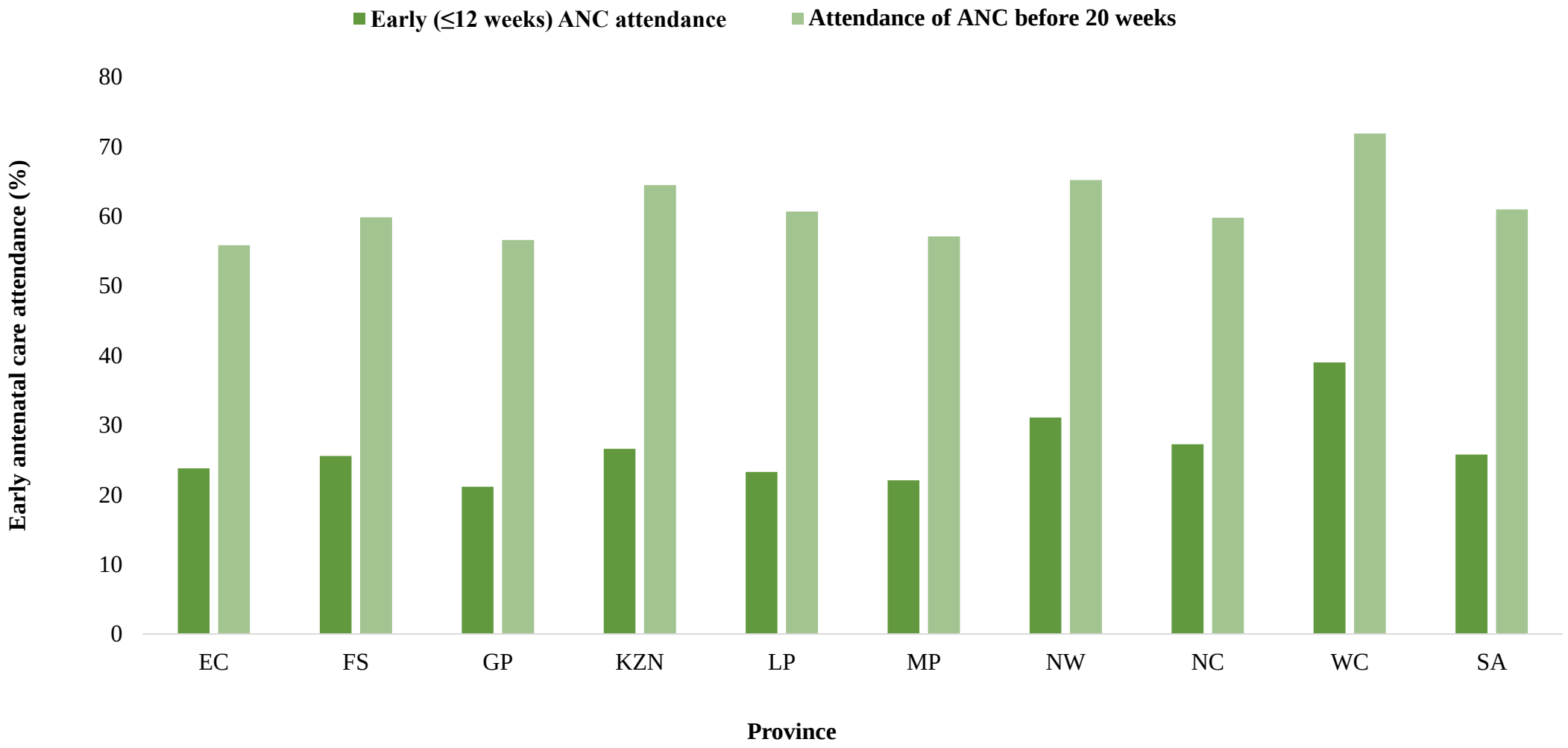
Data weighted.

Maternal Syphilis Care Cascade



Data weighted.

Early ANC Attendance by Province



Data weighted.

DISCUSSION

Discussion

- Mixed bag of results
- On the upside
  - Declining HIV prevalence in all provinces, most districts and among women <35 years
  - Near universal HIV testing and ART initiation among positives (with 67.9% on DTG)
  - Good viral load coverage
  - High agreement between laboratory and routine data at national level

- On the downside
  - Low levels of early ANC attendance
  - Declining ART initiation prior to pregnancy (might be due to COVID-19)
  - Increasing syphilis sero-prevalence
  - High PrEP eligibility with low coverage prior to/ during pregnancy

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. Other races not adequately represented in the survey
- Missing data and inconsistent results e.g. HIV testing, ART and viral load, parity, gravidity and gestational age
- Data on HIV testing and results based on record review represents HIV testing in the past and new infections/seroconversions in the interim could bias agreement results
- The lack of standardized syphilis testing at facility level can affect the syphilis prevalence estimate
- Syphilis testing and treatment data did not take into account timing

RECOMMENDATIONS/ SUGGESTIONS

Recommendations/Suggestions for Policy and Practice

- Continue to strengthen and promote early ANC attendance
  - This can be done through primary health care 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 maximize 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.

Recommendations/Suggestions for Policy and Practice

- 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.

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Thank you!!