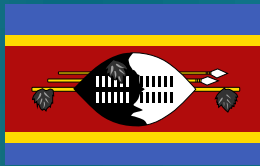


Eswatini Population-based HIV Impact Assessment 3 2021 (SHIMS3 2021)



FINAL REPORT
NOVEMBER 2023



Eswatini Population-based HIV Impact Assessment 3 2021 (SHIMS3 2021)

SHIMS3 COLLABORATING INSTITUTIONS

- Ministry of Health (MOH), Government of the Kingdom of Eswatini (GKoE)
- Central Statistical Office, GKoE
- The United States (US) President's Emergency Plan for AIDS Relief (PEPFAR)
- The US Centers for Disease Control and Prevention (CDC)
- WESTAT
- ICAP at Columbia University

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GLOSSARY OF TERMS

90-90-90/95-95-95: Treatment targets proposed by the Joint United Nations Programme on HIV and AIDS (UNAIDS) to help end the AIDS epidemic. The targets for 2020 were that 90% of all people living with HIV would know their HIV status; 90% of all people with diagnosed HIV would receive sustained antiretroviral therapy (ART); and 90% of all people receiving ART would achieve viral load suppression (VLS). UNAIDS now calls for countries to reach the next set of targets, 95-95-95, by 2025.

Acquired Immunodeficiency Syndrome (AIDS): AIDS is a disease that can develop after HIV causes severe damage to the immune system, leaving the body vulnerable to life-threatening conditions, such as infections and cancers.

Adults: Unless otherwise noted, adults are defined as the survey population aged 15 years and older.

Antiretroviral (ARV): A type of medication that inhibits the ability of HIV to multiply in the body.

Antiretroviral Therapy (ART): Treatment with a combination of ARV medications that reduces the amount of HIV in the body (viral load), leading to improved health and survival in a person living with HIV.

CD4+ T Cells: CD4+ T-cells (CD4) are white blood cells that are an essential part of the human immune system. These cells are often referred to as T-helper cells. HIV attacks and kills CD4 cells, leaving the body vulnerable to a wide range of infections. The CD4 count is used to determine the degree of weakness of the immune system from HIV infection.

Coronavirus disease 2019 (COVID-19): An illness caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), a virus that can be spread from person to person. The ongoing pandemic caused by COVID-19 has caused millions of deaths, led to major societal and economic disruptions, and profoundly strained health systems across the globe.

De Facto Household Resident: A person who slept in the household the night before the survey.

Enumeration Area (EA): A limited geographic area defined by the national statistical authority and the primary sampling unit for the Population-based HIV Impact Assessment (PHIA) surveys.

Head of Household: The person who is recognized within the household as being the head and is aged 18 years or older or is considered a child with special circumstances (an individual aged 15-17 years who is married, the parent of a child, or has left home and is self-sufficient) as defined by law in Eswatini.

Human Immunodeficiency Virus (HIV): HIV is the virus that causes AIDS. The virus is passed from person to person through blood, semen, vaginal fluids, and breast milk. HIV attacks CD4 cells in the body, leaving a person living with HIV vulnerable to illnesses that a healthy immune system would eliminate.

HIV Incidence: A measure of the frequency with which new cases of HIV occur in a population over a period of time. The denominator is the population at risk; the numerator is the number of new cases that occur during a given time.

HIV Prevalence: The proportion of persons in a population who are living with HIV at a specific point in time.

HIV Viral Load: The concentration of HIV RNA in the blood, usually expressed as copies per milliliter (mL).

HIV Viral Load Suppression (VLS): An HIV viral load of less than 1,000 copies per mL.

Household: A person or group of persons related or unrelated to each other who live in the same compound (fenced or unfenced), share the same cooking arrangements, and have one person whom they identify as head of that household.

Informed Consent: Informed consent is a legal condition whereby a person can give consent based upon a clear understanding of the facts, implications, and future consequences of an action. To give informed consent, the individual concerned must have adequate reasoning faculties and be in possession of all relevant facts at the time he or she gives consent.

Male Circumcision: Male circumcision is the removal of some or the entire foreskin (prepuce) from the penis. Medically supervised adult male circumcision is a scientifically proven method for reducing a man's risk of acquiring HIV through heterosexual intercourse. Voluntary medical male circumcision is an important part of national HIV prevention programs in most HIV high-burden countries.

Older Adolescents: Unless otherwise noted, individuals aged 15-19 years are referred to as older adolescents (older adolescent girls and older adolescent boys). Note that while older adolescents are included as part of the aggregated adult population for reporting purposes, they are distinct from young adults as a population of concern for HIV programs.

Population Viremia: Population viremia is the prevalence of unsuppressed viral load (defined here as $\geq 1,000$ copies/mL) measured without regard to HIV status. The numerator is the number of people with unsuppressed viral loads, and the denominator is the entire population tested. Subnational areas with higher population viremia could be at risk of higher incidence.

Pre-exposure Prophylaxis (PrEP): PrEP is the use of ARVs by people at risk for HIV to prevent HIV acquisition.

Prevention of Mother-to-Child Transmission (PMTCT): In order to prevent women living with HIV from passing the virus to their babies during pregnancy, labor and delivery, or breastfeeding, the World Health Organization (WHO) recommends a four-pronged approach: (1) primary prevention of HIV infection among women of childbearing age; (2) preventing unintended pregnancies among women living with HIV; (3) preventing HIV transmission from women living with HIV to their infants; and (4) providing appropriate treatment, care, and support to mothers living with HIV and their children and families.

Tuberculosis: Tuberculosis (TB) is a bacterial disease that most often affects the lungs but can also affect other parts of the body. When a person with active TB coughs, sneezes, sings, or talks, TB bacilli can spread through the air and may remain airborne in an enclosed area for hours. TB is the leading cause of death among people living with HIV.

Young Adults: Unless otherwise noted, individuals aged 20-24 years are defined as young adults, including young women and young men.

Young People: In this report, individuals aged 15-24 years are defined as young people. By sex, this includes older adolescent girls aged 15-19 years and young women aged 20-24 years and older adolescent boys aged 15-19 years and young men aged 20-24 years.

LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome	ODn	(normalized) Optical Density
ANC	Antenatal Care	PCR	Polymerase Chain Reaction
ART	Antiretroviral Therapy	PEPFAR	US President's Emergency Plan for AIDS Relief
ARV	Antiretroviral	PHIA	Population-based HIV Impact Assessment
CDC	US Centers for Disease Control and Prevention	PMTCT	Prevention of Mother-to-Child Transmission
CD4	CD4+ T cell	PrEP	Pre-Exposure Prophylaxis
CI	Confidence Interval	PSU	Primary Sampling Unit
CSO	Central Statistical Office	QA	Quality Assurance
DBS	Dried Blood Spot	QC	Quality Control
DTS	Dried Tube Specimens	RR	Response Rate
EA	Enumeration Area	SMS	Short Message Service
ENAP	Eswatini National AIDS Program	SHIMS3	Eswatini Population-based HIV Impact Assessment 3 2021
GKoE	Government of the Kingdom of Eswatini	TB	Tuberculosis
HBTC	Home-Based Testing and Counseling	TNA	Total Nucleic Acid
HIV	Human Immunodeficiency Virus	UNAIDS	Joint United Nations Programme on HIV and AIDS
LA_g	Limiting Antigen	VLS	Viral Load Suppression
mL	Milliliter	VMMC	Voluntary Medical Male Circumcision
µL	Microliter	WHO	World Health Organization
MOH	Ministry of Health		
MOS	Measure of Size		
MTCT	Mother-to-Child Transmission		

FOREWORD

The Government of the Kingdom of Eswatini is pleased to present the third Eswatini Population-based HIV Impact Assessment SHIMS3 2021 report. Following SHIMS 1, conducted in 2011 and SHIMS 2, in 2016-2017, SHIMS3 provides a measure of the impact of the national HIV response and headway toward HIV epidemic control. It further provides critical information for policy direction and strategic planning to motivate innovative approaches within the global landscape of new HIV delivery models and prevention methods. SHIMS3 reflects impressive progress towards eliminating HIV/AIDS as a public health threat in Eswatini.

SHIMS3 results show a continued reduction in new HIV infections with annual incidence among adults down from 1.13% in SHIMS 2 to 0.62%, as well as a decrease in HIV prevalence from 27.0% in SHIMS2 to 24.8%. The proportion of people living with HIV with suppressed viral load increased to 88.6%. SHIMS3 results also show sustained progress towards the ambitious UNAIDS 95-95-95 targets set for 2025, with Eswatini at 94-97-96. Eswatini demonstrated remarkable HIV program achievements despite social and economic disruptions and challenges associated with COVID-19.

SHIMS3 was led by the Government of the Kingdom of Eswatini (GKoE) through the Ministry of Health and the Central Statistical Office. The survey was conducted with funding from the United States (US) President's Emergency Plan for AIDS Relief (PEPFAR) and through technical assistance and partnership with the US Centers for Disease Control and Prevention (CDC). SHIMS3 was implemented by ICAP at Columbia University in collaboration with GKoE entities including the National Health Research and Innovation Department, Eswatini Health Laboratory Services, Eswatini National AIDS Program, Health Promotion Unit, the Environmental Health Department, and the National Emergency Response Council on HIV/AIDS (NERCHA). The GKoE wishes to acknowledge expert contributions of the Core Leadership Group, Technical Steering Committees, the Project Implementation Task Team and international and development partners who collaborated and provided input on planning and successful implementation of the survey.

On behalf of His Majesty's Government, I therefore call to action all sectors, agencies, programmers, policy makers, partners, and relevant stakeholders to fully utilize findings in this document to prioritize Emaswati who are disproportionately affected to improve the health of all people of the Kingdom of Eswatini.



Mr. Mduduzi Matsebula

Honourable Minister for Health

ACKNOWLEDGEMENTS

SHIMS3 was led by the Government of the Kingdom of Eswatini (GKoE) through the Ministry of Health (MOH) and the Central Statistical Office (CSO). Successful implementation of SHIMS3 conducted from May 2021 through to November 2021, was due to the joint effort and partnership of the Eswatini MOH, CSO, the United States (US) President's Emergency Plan for AIDS Relief (PEPFAR) through the US Centers for Disease Control and Prevention (CDC), ICAP at Columbia University in Eswatini, Regional and New York offices, Westat and the National Emergency Response Council on HIV/AIDS (NERCHA).

The GKoE sincerely appreciates the unwavering commitment and surefooted guidance of the former Minister for Health Honorable Senator Lizzie Nkosi supported by the Core Leadership Group of directors from the MOH, CSO, NERCHA, CDC/PEPFAR, the World Health Organization (WHO), UN agencies, and ICAP in Eswatini. The GKoE wishes to acknowledge expert contributions of the Technical Steering Committees, the Project Implementation Task Team (PITT) and international and development partners who collaborated and provided input on planning and successful implementation of the survey. The success of a huge undertaking such as SHIMS3 hinges on strong partnerships. Through harmonized actions and partnership with GKoE entities including the Eswatini Health Laboratory Services (EHLS), Epidemiology and Disease Control Unit (EDCU), Eswatini National AIDS Program (ENAP), Environmental Health Department (EHD), the Health Information and Management System, the Health Promotion Unit (HPU), the National Health Research and Innovation Department (NHRID), and the Rural Health Motivators Program, SHIMS3 was successfully completed with joint efforts of implementing partners including ICAP, CHAI, EGPAF, PSI, Baylor, Kwakha Indvodza (KI), PACT, Georgetown University, the WHO, and United Nations Family.

We sincerely appreciate the technical contributions of the Principal Investigators: Sindisiwe Dlamini (MOH), Choice Ginindza (CSO), Harriet Nuwagaba-Biribonwoha (ICAP in Eswatini), Michelle Li (CDC Eswatini), Neena Philip (ICAP in New York), Kristin Brown (CDC Atlanta). A special thank you is extended to the PHIA2 team leads Dr David Hoos and Professor Wafaa El-Sadr who are both affiliated to ICAP at Columbia University. On a sad note, I wish to express my heartfelt condolences for the loss of Ms Zandile Mnisi, who was a prominent leader in the Eswatini research network and served as the MOH Principal Investigator under SHIMS3 and the NHRID lead prior to her demise. Her substantive contributions, technical expertise, and tireless efforts in steering the Eswatini research agenda are truly recognized.

Lastly and equally important, the MOH wishes to recognize and appreciate survey management, field teams, laboratory teams and community mobilization teams for delivery of critical HIV impact quality data. To the communities, the GKoE appreciates your good reception of field teams and, most of all, a very big thank you goes to the participants for their cooperation.

In conclusion, congratulations go to the Kingdom of Eswatini for completing the third consecutive Population-based HIV Impact Assessment.



Mr. Khanyakwezwe L. Mabuza
Principal Secretary, Ministry of Health

PREFACE

SHIMS3, the third Eswatini Population-based HIV Impact Assessment (PHIA), was a household-based national survey among adults (defined as those aged 15 years and older) to measure the impact of the national HIV response. Conducted from May 2021 through November 2021, SHIMS3 offered HIV counseling and testing with return of results and collected information about uptake of HIV care and treatment services. SHIMS3 estimated national HIV incidence, the national and regional HIV prevalence, and the prevalence of viral load suppression (VLS) defined as HIV RNA <1,000 copies/mL among all adults living with HIV in Eswatini. The results of these surveys provide information on national and regional progress toward control of the HIV epidemic.

SHIMS3 was led by the Government of the Kingdom of Eswatini (GKoE) through the Ministry of Health (MOH) and the Central Statistical Office. The survey was conducted with funding from the United States (US) President's Emergency Plan for AIDS Relief (PEPFAR) and through technical assistance and partnership with the US Centers for Disease Control and Prevention (CDC). SHIMS3 was implemented by ICAP at Columbia University in collaboration with GKoE entities including the National Health Research and Innovation Department, Eswatini Health Laboratory Services, Eswatini National AIDS Program, Health Promotion Unit, the Environmental Health Department, and the National Emergency Response Council on HIV/AIDS (NERCHA). The GKoE and international development partners participated in steering committees and task teams to provide input on survey planning and implementation.

SHIMS3 2021 used a two-stage stratified cluster sample design, that first selected census enumeration areas (EAs) and then selected households within each EA. The first stage selected 200 EAs with an average of 35 households per EA (Table 2.1). The overall sample size and allocation by regional area was calculated to estimate incidence at the national level among adults aged 15-49 years, VLS at both regional and national levels among adults aged 15-49 years living with HIV, and VLS at the national level among young women aged 15-24 years* living with HIV. To reach the target sample size, the study planned to enroll at least 9,248 eligible adults aged 15-49 years and 2,363 eligible adults aged 50 years and older—with approximately 11,611 persons aged 15 years and older expected to participate in the survey. Of 6,485 occupied eligible households, 83.2% completed a household interview (Table 2.2). Among 14,010 eligible adults aged 15 years and older (7,697 women and 6,313 men), a total of 12,043 adults participated in the individual interview. Among those interviewed, 11,199 (6,545 women and 4,654 men) also had their blood drawn (Table 2.3).

HIV testing was conducted in each household using a serological rapid diagnostic testing algorithm based on Eswatini's national guidelines, with laboratory confirmation of seropositive samples using a supplemental assay. For confirmed HIV-positive samples, laboratory-based testing was conducted for quantitative evaluation of viral load and qualitative detection of ARVs (efavirenz, dolutegravir, atazanavir, lopinavir and nevirapine). A laboratory-based incidence testing algorithm (HIV-1 limiting antigen-avidity assay with correction for viral load and detectable ARVs) was used to distinguish recent from long-term infection. Incidence estimates were obtained using the formula recommended by the World Health Organization Incidence Working Group and Consortium for Evaluation and Performance of Incidence Assays. Survey weights were utilized for all estimates.

Originally scheduled to begin in March 2020, the survey launch was placed on hold for more than a year due to the COVID-19 pandemic. The GKoE instituted a series of policies to contain the potential spread of SARS-CoV-2. During the pause, the project team continually monitored the COVID-19 situation in the country and worked with partners to develop guidelines for mitigating risk of COVID-19 transmission during survey implementation. These comprehensive guidelines prioritized the health and well-being of the team members, members of surveyed households, and the larger communities in which data collection took place (see COVID-19 mitigation in Chapter 2). When MOH and the project team partners determined that data collection could begin, the survey implemented precautions that allowed teams to safely go into communities.

* The term "young people" includes older adolescents aged 15-19 years and young adults aged 20-24 years. Older adolescents are a distinct population of concern from young adults, but this report uses the terms "young women aged 15-24 years" and "young men aged 15-24 years" when young people are disaggregated by sex.



EXECUTIVE SUMMARY

TOPLINE FINDINGS

- The annual HIV incidence among adults (defined as individuals aged 15 years and older) was 0.62%, which corresponds to approximately 4,000 new HIV infections annually
- HIV prevalence among adults was 24.8%, which corresponds to approximately 185,000 adults living with HIV in Eswatini.
- Prevalence of VLS among all adults living with HIV in Eswatini was 88.6%.
- VLS prevalence across regions was above 87%.

TOPLINE FINDINGS IN FOCUS

- The annual HIV incidence among adults (those aged 15 years and older) in Eswatini was 0.62%, which corresponds to approximately 4,000 new HIV infections per year among adults. HIV incidence was higher among women, at 1.11% (95% CI: 0.53%-1.68%*) than among men, at 0.17% (95% CI: 0.00%-0.41%*) (Tables 5.1 and 5.2).
- Prevalence of HIV among adults was 24.8%, which corresponds to approximately 185,000 adults living with HIV. HIV prevalence was higher among women, at 30.4% (95% CI: 28.8%-31.9%*) compared to 18.7% among men (95% CI: 17.4%-20.0%*) (Tables 6.2 and 5.2).
- The survey estimated that 88.6% of adults living with HIV in Eswatini had suppressed viral loads: 90.1% among women and 86.1% among men. Note, these estimates of VLS are among all adults living with HIV regardless of their knowledge of HIV status or use of antiretroviral therapy (ART) (Table 8.1).
- At the regional level, there were no statistical differences in the prevalence of VLS, which ranged from 87.7% in Manzini to 89.6% in Shiselweni (Table 8.1, Figures 8.1.1 and 8.1.2).

Close to 89% of adults living with HIV in Eswatini had suppressed viral loads.

UNAIDS 95-95-95 TARGETS

UNAIDS set the 95-95-95 targets with the aim that by 2025, 95% of all people living with HIV would know their status, 95% of those who were diagnosed would be on ART, and 95% of those who were on ART would have VLS.† Eswatini's progress towards achieving these targets is presented in two ways: the conditional 95-95-95 and the overall 95-95-95.

Adult 95-95-95, based on self-report and antiretroviral detection in blood:

For the conditional 95-95-95, the denominator for the second and third 95 is the value of the preceding 95 (Figure 1, Table 9.1.B, and Figure 9.1):

- **Diagnosed:** In Eswatini, 93.7% of adults living with HIV were aware of their HIV-positive status. A higher proportion of women living with HIV were aware of their status, at 94.9% (95% CI: 93.8%-96.0%*) than men living with HIV, at 91.6% (95% CI: 89.6%-93.5%*).
- **On treatment:** Among those who were aware of their HIV-positive status, 97.3% were on ART: 98.1% of women and 95.9% of men.
- **With viral load suppression:** Among those aware of their status and on treatment, 96.2% had suppressed viral loads: 95.9% of women and 96.7% of men.

* In this report, 95% CIs are presented whenever a comparison is made between two estimates to show that the intervals do not overlap. Note that these CIs are not always available in the table. See Chapter 2, section 6 for more information.

† Joint United Nations Programme on HIV/AIDS (UNAIDS). Prevailing against pandemics by putting people at the centre. Geneva: UNAIDS; 2020. https://www.unaids.org/sites/default/files/media_asset/prevailing-against-pandemics_en.pdf

Figure 1
Conditional 95-95-95 Achievements Among Adults



Close to 95% of all the adults aged 50 years and older in Eswatini had viral load suppression on treatment.

For the overall 95-95-95, the denominator for all three 95s is the overall population of adults living with HIV in Eswatini (Table 9.1.A, Figure 9.1). Note that these estimates are based on the survey population for whom data on treatment status and viral load are available:

- **Diagnosed:** 93.7% of adults living with HIV were aware of their HIV status, with a higher proportion among women, at 94.9% (95% CI: 93.8%-96.0%^{*}) than men, at 91.6% (95% CI: 89.6%-93.5%).
- **On treatment:** Among all adults living with HIV in Eswatini, 91.2% were on ART, with a higher proportion among women, at 93.1% (95% CI: 91.9%-94.3%^{*}) than among men, at 87.8% (95% CI: 85.4%-90.2%).
- **On treatment with viral load suppression:** Among all adults living with HIV in Eswatini, 87.7% had achieved VLS on treatment, with a higher proportion among women, at 89.3% (95% CI: 87.9%-90.7%^{*}) than among men, at 85.0% (95% CI: 82.5%-87.4%^{*}).

(Please see chapter 9 for a full explanation of the differences between estimates of VLS among people living with HIV and in the two 95-95-95 cascades).

Young people (ages 15-24 years)[†] 95-95-95, based on self-report and antiretroviral detection in blood:

For the conditional 95-95-95 (Table 9.1.B):

- **Diagnosed:** 85.4% of young people living with HIV were aware of their HIV status: 83.6% among young women and 91.1% among young men.
- **On treatment:** Among all the young people living with HIV who were aware of their status, 96.4% were on ART: 96.4% among young women and 96.4% among young men.
- **With viral load suppression:** Among all the young people living with HIV who were on ART, 89.4% had achieved VLS: 90.4% among young women and 86.5%[‡] among young men.

For the overall 95-95-95 (Table 9.1.A):

- **Diagnosed:** 85.4% all young people living with HIV were aware of their HIV status: 83.6% among young women and 91.1% among young men.
- **On treatment:** 82.4% of all the young people living with HIV were on ART: 80.7% among young women and 87.7% among young men.

* In this report, 95% CIs are presented whenever a comparison is made between two estimates to show that the intervals do not overlap. Note that these CIs are not always available in the table. See Chapter 2, section 6 for more information.

[†] The term "young people" includes older adolescents aged 15-19 years and young adults aged 20-24 years. Older adolescents are a distinct population of concern from young adults, but this report uses the terms "young women aged 15-24 years" and "young men aged 15-24 years" when young people are disaggregated by sex.

[‡] This estimate was based on a denominator between 25 and 49 and should be interpreted with caution.

- **On treatment with viral load suppression:** 73.6% of all the young people living with HIV in Eswatini had achieved VLS on treatment: 72.9% among young women and 75.9% among young men .

HIV prevalence varied by education.

Other 95-95-95 analyses by region, age, and sex :

- There were no marked differences in the overall or conditional 95-95-95 achievements at the regional level. For the conditional 95-95-95, awareness of HIV-positive status ranged from 92.7%-94.7%, on treatment status among those who were aware of their HIV-positive status ranged from 96.8%-98.7%, and VLS among those on ART ranged from 95.1%-97.6% (Table 9.3.B).
- Achievement of the unconditional (overall) 95-95-95 targets peaked among those in older age groups: among all adults living with HIV aged 50 years and older, 96.9% were diagnosed, 96.0% were on treatment, and 94.9% had achieved VLS on treatment (Table 9.1.A).
- While the overall 95-95-95 estimates among all adults living with HIV aged 15 years and older were lower among men than women, the difference was most pronounced among those aged 25-34 years where 74.8% (95% CI: 66.4%-83.3%^{*}) of the men were aware of their HIV-positive status, compared to 93.1% (95% CI: 91.0%-95.2%^{*}) of the women, 65.0% (95% CI: 55.6%-74.4%^{*}) of the men were on treatment compared to 90.0% (95% CI: 86.9%-93.1%^{*}) of the women, and 62.5% (95% CI: 53.5%-71.4%^{*}) of the men were on treatment and had VLS, compared to 85.1% (95% CI: 81.7%-88.6%^{*}) of the women (Table 9.1.A).

OTHER KEY FINDINGS

Household characteristics

- In Eswatini, 42.8% of households had at least one HIV-positive member—45.2% of rural households and 38.8% of urban households (Table 3.4 and Figure 3.4).
- Among all households, 34.1% were headed by a person living with HIV. The proportion of households headed by a person living with HIV was higher in female-headed households than in male-headed households: 37.6% (95% CI: 35.0%-40.2%^{*}) compared to 29.0% (95% CI: 27.0%-31.0%^{*}) (Table 3.5 and Figure 3.5).

Survey population characteristics

- Young people aged 15-24 years comprised almost a third (32.0%) of the survey population, while only 20.2% were aged 50 years and older (Table 4.1).

HIV incidence

- Among adults aged 15-49 years, HIV incidence was 0.77% (95% CI: 0.39%-1.15%) and was higher among women than men in this age group, at 1.45% (95% CI: 0.69%-2.20%^{*}) compared to 0.20% (95% CI: 0.00%-0.48%^{*}) (Table 5.1).

HIV prevalence

- There were no statistical differences in HIV prevalence by region (range: 21.6%-26.5%) (Table 6.2 and Figures 6.2.1 and 6.2.2).

* In this report, 95% CIs are presented whenever a comparison is made between two estimates to show that the intervals do not overlap. Note that these CIs are not always available in the table. See Chapter 2, section 6 for more information.

Less than half of adults living with HIV who received a viral load tests got the results back on their last test.

- HIV prevalence varied by education level attended, with the lowest prevalence among those with more than a secondary education, at 14.0% (95% CI: 12.0%-16.1%), and the next lowest among those with some secondary education, at 24.0% (95% CI: 22.6%-25.4%). HIV prevalence was 30.1% (95% CI: 28.0%-32.3%) among those with some primary education and 36.3% (95% CI: 32.0%-40.6%) among those with no formal education (Table 6.2).
- By 5-year age groups, HIV prevalence peaked at 57.2% among women aged 40-44 years, and at 50.0% among men aged 45-49 years (Table 6.3 and Figure 6.3).

HIV testing, diagnosis, and treatment status

- Among adults aged 15 years and older, 91.1% reported they had ever received an HIV test, with a higher percentage among women, 93.3% (95% CI: 92.6%-93.9%) than among men, 88.8% (95% CI: 87.5%-90.0%) (Table 7.1.A-C).
- Among adults aged 15 years and older who said they were not HIV positive, 56.5% reported they had tested in the 12 months before the survey. This ranged from 38.5% among older adolescents aged 15-19 years up to a peak of 72.9% among adults aged 30-34 years (Table 7.1.A).
- Based upon self-report, adjusted for the detection of ARVs in blood, 6.3% of adults (ages 15 years and older) who tested positive in the survey were unaware of their HIV status: 5.1% among women and 8.4% among men. Among young people aged 15-24 years living with HIV, 14.6% were unaware of their HIV status. By 5-year age group, the proportion who said they were unaware of their HIV-positive status peaked at 19.9% among older adolescent girls aged 15-19 years, and 33.6%[†] among men aged 25-29 years (Tables 7.2.A-C).
- Among the adults aged 15 years and older who tested HIV positive in the survey, 21.0% who said they were not previously diagnosed had ARVs detectable in their blood—and thus were aware of their HIV-positive status and on treatment. Similarly, 13.3% of those who said they knew they were HIV positive but were not yet taking ART, had ARVs detectable in their blood (Table 7.3.C).

Viral load suppression among all adults living with HIV

- Prevalence of VLS was lower among those with some secondary education, at 86.4% (95% CI: 84.4%-88.4%), than those with only some primary or no formal education at 92.2% (95% CI: 90.1%-94.4%) and 92.7% (95% CI: 89.3%-96.2%), respectively. While 87.3% of those with more than a secondary education had suppressed viral loads, the difference was not as marked (Table 8.1).
- VLS prevalence generally increased with age but was similar among young people aged 15-24 years at 77.1% (95% CI: 71.6%-82.6%) and adults aged 25-34 years at 80.4% (95% CI: 76.7%-84.1%) (Table 8.2).
- By sex and 10-year age group, there was a gap in achieving VLS among men aged 25-34 years, at 62.9% (95% CI: 54.0%-71.8%) compared to women in the same age group, at 85.7% (95% CI: 82.3%-89.2%) (Table 8.2).
- VLS was below 85% in each 5-year age group below 40 years among men (although the estimates in the age groups below 25 years were based on a small denominator[†]), and below 30 years among women (Table 8.2).
- Population viremia (the proportion among all the adults aged 15 years and older with *unsuppressed* viral load [$\geq 1,000$ HIV RNA copies/mL]—see chapter 8) in Eswatini was 2.8%, with a range of 2.3% in Hhohho to 3.2% in Manzini (Table 8.3 and Figure 8.3).

* In this report, 95% CIs are presented whenever a comparison is made between two estimates to show that the intervals do not overlap. Note that these CIs are not always available in the table. See Chapter 2, section 6 for more information.

† This estimate was based on a denominator between 25 and 49 and should be interpreted with caution.

- Among all adults living with HIV, 85.4% had a viral load below 200 copies/mL. Among those who were aware of their HIV-positive status and on ART (based on self-report adjusted for detectable ARVs in blood), 93.1% had viral load below 200 copies/mL (Table 8.4).
- Among all adults living with HIV who reported they were receiving HIV care, 86.7% said that they had ever had a viral load test, and among those, 48.2% reported that they had received the results of their last viral load test (Table 8.5).
- Among adults living with HIV in care, Lubombo had the highest proportion who ever had received a viral load test at 90.4% (95 CI: 87.2%-93.6%); and when compared to other regions, the only significant difference was with Manzini at 83.8% (95% CI:81.0%-86.5%) (Table 8.5).

Close to 100% of women living with HIV who were aware of their status when they delivered in the year before the survey took ART to prevent transmission.

Clinical characteristics on people living with HIV

- The median CD4 count among adults living with HIV was 607 cells/ μ L: 668 cells/ μ L among women and 501 cells/ μ L among men (Table 10.1).
- Among adults living with HIV, CD4 count varied depending on awareness of HIV status and treatment status. The median CD4 count was 382 cells/(microliter) μ L among those who were unaware of their status: 419 cells/ μ L among women and 347 cells/ μ L among men; 238 cells/ μ L among those who were aware of their status but not on ART: 316 cells/ μ L among women, and 207 cells/ μ L among men; and 628 cells/ μ L among those who were aware of their status and on ART: 691 cells/ μ L among women and 523 cells/ μ L among men (Table 10.1 and Figure 10.1).
- Among the individuals that were diagnosed with HIV in the survey for the first time based on self-report and ARV detection, a substantial proportion were late diagnoses (CD4 < 350 cells/ μ L), including 32.4% who were immunosuppressed, with CD4 counts between 200-349 cells/ μ L, and 12.6% who had advanced HIV disease (less than 200 CD4 cells/ μ L) (Table 10.2).
- Based upon self-report, 98.9% of all adults living with HIV who had started on ART were still taking it, and there were no marked differences by sex or time on treatment (Table 10.3).

Prevention of mother-to-child transmission of HIV (PMTCT)

- Among women of childbearing age (ages 15-49 years, henceforth referred to as women in this section) who delivered a child in the 3 years before the survey, 98.0% reported attending at least one antenatal care (ANC) visit for their most recent birth (Table 11.1).
- Among women who delivered in the 12 months before the survey, 94.3% reported that they knew their HIV status: 24.4% already knew they were HIV positive, 67.4% tested HIV negative, and 2.5% tested positive during ANC testing (Table 11.2 and Figure 11.3).
- Among women living with HIV who delivered in the 12 months before the survey and who were aware of their status, 99.5% reported that they took ART to reduce mother-to-child transmission: 83.4% reported that they were already on ART before becoming pregnant and 16.1% reported that they started ART during pregnancy or labor or delivery (Table 11.3 and Figure 11.3).
- Among women living with HIV who delivered sometime in the 3 years before the survey, 37.2% reported that they were currently breastfeeding their last-born child at the time of the survey, while 13.5% reported that they had never breastfed (Table 11.4).
- Among the last-born children of women living with HIV born in the three years before the survey, the prevalence of currently breastfeeding at the time of the survey peaked at 91.1% among those aged 2-3 months. At the time of the survey, 52.3% of infants aged 12-17 months,

* In this report, 95% CIs are presented whenever a comparison is made between two estimates to show that the intervals do not overlap. Note that these CIs are not always available in the table. See Chapter 2, section 6 for more information.

More than half of HIV-negative adults said they'd be willing to take PrEP.

12.7% of those aged 18-23 months, and 5.1% of those aged 24-36 months were still breastfeeding (Table 11.4).

- Among women living with HIV who delivered within the 3 years before the survey, 61.4% reported that their infant had an HIV test before they were 2 months of age, while another 24.9% reported that their infant had an HIV test when they were between 2 and 12 months of age (Table 11.5).
- Among women living with HIV, those who were ever pregnant had higher prevalence of VLS than those who reported that they had never been pregnant: 90.2% (95% CI: 88.4%-92.0%) versus 75.1% (95% CI: 67.8%-82.3%). The prevalence of VLS among those who were pregnant at the time of the survey was 79.9% (Table 11.6 and Figure 11.6).

HIV risk factors and prevention interventions

- Early sexual debut (sexual intercourse before the age of 15 years) was reported by 3.3% of adults aged 15 years and older: 3.2% of women and 3.5% of men (Table 12.1).
- Similar rates of early sexual debut were reported by young people aged 15-24 years, at 3.2%. It varied somewhat by region, with 1.3% of the young people in Lubombo and up to 5.0% in Manzini reporting early sexual debut. By education, the proportion reporting early sexual debut was lower, at 0.7% (95% CI: 0.0%-2.0%) among those with more than a secondary education than those with some secondary education, at 3.0% (95% CI: 2.2%-3.9%) or only a primary education, at 4.9% (95% CI: 2.7%-7.0%) (Table 12.3).
- Among adults aged 15 years and older who reported that they had had sex in the 12 months before the survey, 55.1% reported that they had had sex with a nonmarital, noncohabitating partner, 52.5% among women and 57.8% among men. Among these, 62.6% (58.8% of women and 66.1% of men) reported that they had used a condom the last time they had sex with such a partner (Tables 12.4.A-C and Figure 12.4).
- Among men aged 15 years and older, 41.8% reported they had a medical circumcision, 1.5% had a nonmedical circumcision, and 56.8% were uncircumcised. Among young men aged 15-24 years, 66.9% had a medical circumcision and 0.7% had a nonmedical circumcision (Table 12.5).
- Proportions of circumcision varied markedly by HIV status: 79.3% (95% CI: 76.1%-82.6%) of those living with HIV were uncircumcised compared to 51.1% (95% CI: 48.9%-53.3%) of those who were HIV negative (Table 12.5).
- There were no marked differences in circumcision status at the regional level, with 54.8%-59.8% of men reporting that they were uncircumcised (Table 12.5).
- The proportion of men reporting circumcision also varied by education level. A markedly higher proportion of those with no formal education reported that they were uncircumcised, at 81.7% (95% CI: 75.6%-87.8%), than those with only some primary education, at 64.5% (95% CI: 60.9%-68.1%), more of whom, in turn, reported that they were uncircumcised than those with some secondary education, at 52.0% (95% CI: 49.9%-54.1%) (Table 12.5).
- Among adults in Eswatini, 45.1% said that they had heard of PrEP (pre-exposure prophylaxis to prevent HIV acquisition): 49.4% among women and 40.4% among men. Among the HIV-negative adults who said that they had previously heard of it, 11.1% reported that they had ever taken PrEP: 12.5% among women, and 9.4% among men. Among the HIV-negative adults who had heard of, but not yet taken PrEP, 66.1% said that they would be willing to take it, while 50.4% of those who only heard about PrEP during the survey said they would be willing to take it (Tables 12.6-12.8).

* In this report, 95% CIs are presented whenever a comparison is made between two estimates to show that the intervals do not overlap. Note that these CIs are not always available in the table. See Chapter 2, section 6 for more information.

A lower percentage of women reported receipt of cervical cancer screening in rural areas.

Tuberculosis and cervical cancer screening

- Among women aged 15 years and older living with HIV in Eswatini, 53.6% reported that they had ever been screened for cervical cancer. Among these, 3.7% reported that they had received an abnormal result (Table 13.1).
- Among the age group of women living with HIV that was previously prioritized by WHO for screening (ages 30-49 years[†]), 63.4% reported ever receiving cervical cancer screening, and among these, 3.8% reported that they received an abnormal result (Table 13.1).
- Among women, there were variations and disparities in the self-reported receipt of cervical cancer screening services by residence, and region (Table 13.1).
 - A lower percentage of women reported receipt of cervical cancer screening in rural areas than in urban settings: 50.8% (95% CI: 47.6%-53.9%[†]) versus 59.7% (95% CI: 55.3%-64.2%[†]).
 - The proportion of women who reported cervical cancer screening was highest in Hhohho, at 57.6% (95% CI: 51.9%-63.4%[†]); when compared to other regions, and the only significant difference was with Shiselweni, where 45.1% (95% CI: 38.9%-51.2%[†]) of the women reported having been screened.
- According to adults who reported that they attended a tuberculosis (TB) clinic in the 12 months before the survey, 66.8% were tested for HIV, 21.2% already knew they were HIV positive, but 12.0% reported that were not tested and they did not know their status (Table 13.3 and Figure 13.3).
- Among adults living with HIV, 7.2% reported that they had visited a TB clinic in the 12 months before the survey. Among those, 18.5% said they received a TB diagnosis, and among those who were diagnosed with TB, 80.5%[‡] said that they were treated for TB during that period (Table 13.4).
- Among adults living with HIV in the survey, 76.3% reported that they had been screened for TB at their last HIV care-related clinic visit (Table 13.5 and Figure 13.5).

GAPS AND UNMET NEEDS

Although Eswatini has made remarkable progress in the fight against HIV, the country remains highly impacted by HIV; and there is still considerable work to be done for Eswatini to achieve the UNAIDS goal of ending the AIDS epidemic by 2030.

- Women remained at a particularly high risk of HIV acquisition, with an HIV incidence much higher than among men. Women of childbearing age continued to bear a higher HIV disease burden than men. More than half the women in the age groups between 35-49 years were living with HIV.
- Gaps remain making certain all adults living with HIV in Eswatini, particularly young people and men, are diagnosed. For instance, although only one out of 16 people who tested positive in the survey was unaware of their HIV status, nearly one out of five older adolescent girls aged 15-19 years living with HIV and a third of men aged 25-29 years[‡] were unaware of their HIV status.

* Note that in the recent edition of its guidance, WHO updated their recommendation to starting regular cervical cancer screening among women living with HIV at the age of 25 years. WHO guideline for screening and treatment of cervical pre-cancer lesions for cervical cancer prevention, second edition. Geneva: World Health Organization; 2021. License: CC BY-NC-SA 3.0 IGO.

[†] In this report, 95% CIs are presented whenever a comparison is made between two estimates to show that the intervals do not overlap. Note that these CIs are not always available in the table. See Chapter 2, section 6 for more information.

[‡] This estimate was based on a denominator between 25 and 49 and should be interpreted with caution.

There was room for improvement in the consistent use of condoms.

- One out of five of those who said they were previously undiagnosed and tested positive in the survey were already aware of their status and on treatment, indicating a need to understand the reasons for unwillingness to disclose a prior HIV diagnosis and prior ART use.
- Almost half of those who were presumably newly diagnosed (based on self-report and ARV-detection) could be categorized as late diagnoses (diagnosed with < 350 CD4 cells/μL), although it is possible that some may have not reported a previous diagnosis but are not currently on ART. Either way, in the absence of treatment, these individuals are at significant risk of clinical progression. Generally, regardless of awareness status, men had lower CD4 counts than women—and the median CD4 cell count for men unaware of their status was below 350 cells/μL. Notably, among individuals who acknowledged they were aware of their HIV-positive status but were not currently on ART, a median CD4 count close to 200 cells/μL was observed, particularly among men (at 207 cells/μL) suggesting that some of these individuals also already have advanced HIV disease, and others are at risk of developing advanced HIV disease if they do not go on ART soon.
- Gaps remain in achieving VLS among young people, and men in the prime of their lives, indicating challenges linking to, adhering to, or staying on routine care at these stages of life. The association of secondary education with lower rates of VLS is also worth investigating, as there may be aspects of their life or work that create hurdles to accessing or routinely taking treatment.
- Access to routine viral load testing and one's viral load results is essential to give people living with HIV the ability to protect their HIV-negative sexual partners from HIV acquisition. While receipt of viral load testing was over 85%, receipt of recent test results was below 50%, highlighting a need to discuss the meaning of viral load test result.
- Pregnant women in Eswatini show exceptional levels of ANC attendance, awareness of their HIV status, and ART coverage. However, among women testing HIV-positive in the survey who said they were pregnant, only 80% had suppressed viral loads, implying substantial new diagnoses during pregnancy. Continued progress towards eliminating maternal-to-child HIV transmission requires further strengthening of safer pregnancy strategies among reproductive-age women, like HIV testing for early diagnosis and treatment, and PrEP uptake before and during pregnancy planning.
- The population viremia in Eswatini signifies the ongoing risk of HIV acquisition among the HIV-negative population, and the need to optimize HIV prevention efforts, including case detection and viral load suppression among people living with HIV.
- There were regional differences in reported rates of early sexual debut, and differences by education level attended.
- Although the differences in circumcision status between HIV-negative and HIV-positive men suggest that the country's voluntary medical male circumcision (VMMC) program is appropriately targeting the HIV-negative population, more than half of the country's HIV-negative men remain uncircumcised—and there are clear gaps reaching those with less education.
- Among the HIV-negative population who had not yet taken PrEP, the willingness to take PrEP was over 50%, even among those who had only learned about PrEP during the survey — representing a potential opportunity.
- There were disparities in receipt of cervical cancer screening services by residence (lower in rural settings than urban areas) and regionally, according to self-reports, highlighting the need for increased coverage of cervical cancer screening.

- While awareness of HIV status among those who visited TB clinics was approaching 90%, it should be universal. Similarly, TB treatment, which should be universal among those who reported they received a TB diagnosis, was only around 80%, although factors such as availability of adequate treatment for drug resistant TB may contribute to treatment delay. Finally, the WHO policy of universal TB symptom screening among people living with HIV at each contact with the health system was not being met.

Targeted testing campaigns should be offered wherever young people gather such as schools and universities.

PROGRAMMATIC RESPONSES OR RECOMMENDATIONS FROM MOH

- Expanding existing HIV surveillance systems that include case surveillance through HIV recency testing and a rapid public health response for early detection of new HIV infections and transmission interruption could improve timely diagnosis and help bring HIV incidence down to zero.
- National policy currently prioritizes the provision of combination prevention packages using differentiated approaches that are appropriate for each priority and key population. By including enhanced education in schools and on social media, knowledge about HIV risk reduction could be improved.
- Adolescent girls and young women may benefit from a surge of effort to bolster existing prevention programs, particularly PrEP, and provide them with additional prevention interventions tailored to their needs to reduce their risks of HIV acquisition. Structural interventions including economic empowerment may help reduce vulnerability to HIV infection caused by poverty and unemployment.
- Comprehensive male-friendly health services should be enhanced for men, such as at their workplaces and in other places men frequent, particularly to increase HIV diagnosis, as well as their uptake of prevention interventions, such as PrEP, condoms, and VMMC.
- Targeted testing campaigns should be offered wherever young people gather such as schools and universities. In addition, in concert with the expansion of testing and prevention services for young people, social media campaigns should be rolled out to increase knowledge and enhance demand for VMMC, condoms, PrEP, and Test and Treat among young people. More research is needed to understand the reasons for not disclosing one's HIV status and ART use.
- Differentiated service delivery models with programs tailored to diagnose, link, and retain young people and men in the prime of their lives on treatment should improve their health outcomes and reduce the risk of HIV acquisition among their partners.
- Expanded access to viral load testing and receipt of results can empower people living with HIV to disclose their status and strive to achieve undetectable viral loads to protect their partners and children from HIV acquisition.
- A strengthened focus on rural healthcare for women could address gaps in the provision of life-saving cervical cancer screening.
- There should be a renewed commitment to screening and treatment of TB/HIV co-infection and efforts to expand access to state-of-the-art TB prevention, screening, diagnosis, and treatment.

CONCLUSION

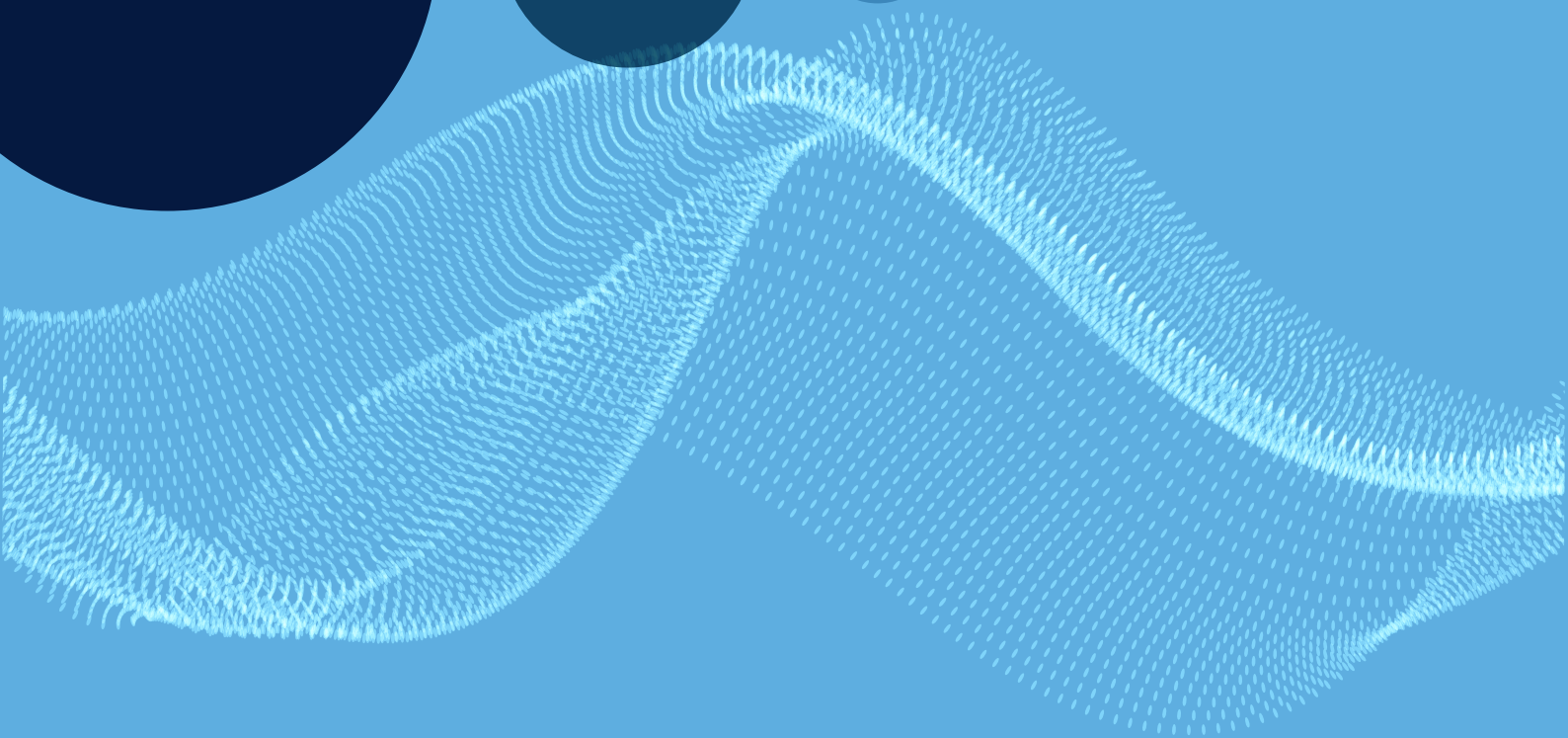
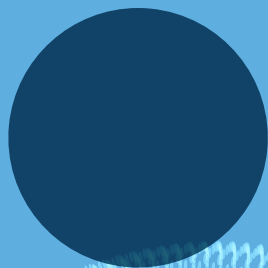
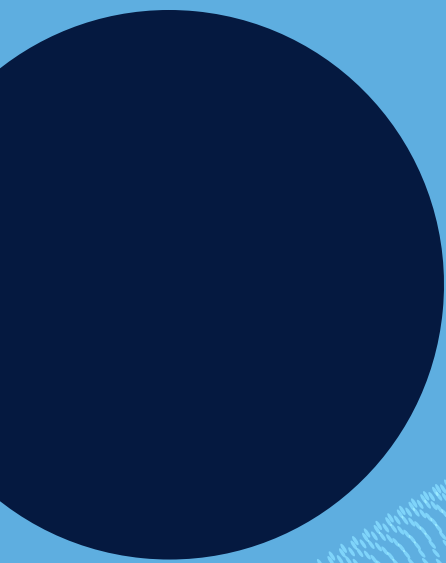
SHIMS3 2021 provided critical data on the impact of Eswatini's HIV programs:

- The primary outcome of annual HIV incidence was 0.62%, but there is a significant disparity in incidence between adult men (0.17%) and women (1.11%).
- With an HIV prevalence among adults of 24.8%, there are now approximately 185,000 adults living with HIV in Eswatini who need ongoing treatment and support.
- In each region, prevalence of VLS among all adults living with HIV in Eswatini was above 87%, and nationally is 88.6%.
- Our conditional 95-95-95 achievements among adults reached new heights, with 94% of those living with HIV who were aware of their HIV status, 97% of those who aware of their status on ART, and 96% of those on ART had suppressed viral loads.

Challenges for our program were also detected:

- Women continue to bear a higher burden of HIV and intensified evidence-based interventions are needed to reduce the incidence among women, especially young women.
- Gaps remain in diagnosing and achieving treatment and VLS targets among young people and men aged 25-34 years. Programs tailored to diagnose, link, and retain these young people and men in the prime of their lives on treatment should improve their health outcomes.

MOH encourages public health staff, programmers, epidemiologists, and policy makers to examine the SHIMS3 data for their respective program areas and utilize the data to inform program planning.



1. INTRODUCTION

1.1 BACKGROUND

The Population-based HIV Impact Assessment is a multicountry project funded by the United States (US) President's Emergency Plan for AIDS Relief (PEPFAR) to conduct national HIV-focused surveys that describe the status of the HIV epidemic. The surveys measure important national and regional area HIV-related parameters, including progress toward the achievement of the Joint United Nations Programme on HIV and AIDS (UNAIDS) 95-95-95 targets for 2025 and will guide policy and funding priorities.*

SHIMS3 2021 was led by the Government of Kingdom of Eswatini (GKoE) through the Ministry of Health (MOH) and the Central Statistical Office (CSO). The survey was conducted with funding from PEPFAR and technical assistance through the US Centers for Disease Control and Prevention (CDC). ICAP at Columbia University implemented the survey in collaboration with the government of Eswatini at national and regional levels. The GKoE, local civil society organizations, and international development partners participated in steering committees and technical working groups to provide input on survey planning and implementation.

1.2 OVERVIEW OF SHIMS3 2021

SHIMS3 2021 was a household-based national survey among adults (defined as those aged 15 years and older) that measured the status of Eswatini's national HIV response. Conducted from May 2021 through November 2021, SHIMS3 2021 offered HIV home-based testing and counseling (HBTC) with return of results and collected information about households and individuals' backgrounds, and the uptake of HIV care and treatment services. Like SHIMS 1 in 2011, and SHIMS 2 in 2016-2017, SHIMS3 estimated national HIV incidence, the national and regional HIV prevalence, and the prevalence of viral load suppression (VLS) defined as HIV RNA <1,000 copies/mL among all adults living with HIV in Eswatini.

With its focus on measuring key biological endpoints in a nationally representative sample of the population, SHIMS3 2021 provides direct estimates of HIV-infection risk and burden, the effectiveness and population-level impact of HIV-related prevention, care, and treatment interventions implemented in the country, and Eswatini's progress toward the achievement of the UNAIDS 95-95-95 targets.

1.3 SPECIFIC OBJECTIVES

The goal of the survey was to assess the status of the HIV epidemic in Eswatini as well as the coverage and impact of HIV services at the population level and to characterize HIV-related risk behaviors using a nationally representative sample of adults.

The main objectives of the survey were:

- To estimate the regional-level prevalence of VLS among adults living with HIV
- To measure national and regional HIV prevalence
- To generate national HIV incidence estimates
- To collect high quality data on HIV-related risk behaviors
- To explore the behavioral and demographic determinants of HIV incidence and prevalence
- To assess health response coverage by gathering data on the uptake, and barriers to uptake, of HIV-related services and exposure to HIV interventions
- To produce weighted estimates of the prevalence of primary and secondary antiretroviral (ARV) drug resistance (DR) in adults living with HIV; and
- To document the country's progress towards achievement of UNAIDS 95-95-95 targets.

* Joint United Nations Programme on HIV/AIDS (UNAIDS). *Prevailing against pandemics by putting people at the centre*. Geneva: UNAIDS; 2020. https://www.unaids.org/sites/default/files/media_asset/prevailing-against-pandemics_en.pdf.



2. SURVEY DESIGN, METHODS, AND RESPONSE RATES

SHIMS3 2021 was a nationally representative, cross-sectional, two-stage, population-based survey of households across Eswatini. Its target population was adults (defined as individuals aged 15 years and older for the purposes of the survey).

2.1 SAMPLE FRAME AND DESIGN

SHIMS3 2021 used a two-stage, stratified cluster sample design. The sampling frame was comprised of all households in the country, based upon the Eswatini 2017 Eswatini Population Census, and subsequently updated by CSO prior to August 2019, derived from the 2,260 EAs containing an estimated 264,856 households as of 2019.¹ The first stage selected 200 EAs using a probability proportional to size method. The 200 EAs were stratified into 8 strata defined as the urban and rural portions of each of the country's 4 regions. During the second stage, a sample of households was randomly selected within each EA, or cluster, using an equal probability method where the average number of households selected per cluster was 35. The actual number of households selected per cluster ranged from 15 to 70 (Table 2.1).

The sample size was calculated to estimate the following indicators: (1) VLS among HIV-positive persons aged 15-49 years at the regional with a 95% CI \pm 10% ; (2) HIV incidence among persons aged 15-49 years at the national level with a relative standard error (RSE) \leq 30%; (3) national-level VLS among HIV-positive persons aged 15-49 years with a 95% CI \pm 3%; and (4) national-level VLS among HIV-positive women aged 15-24 years with a 95% CI \pm 6%. To reach the target sample size, the study planned to enroll at least 9,248 eligible adults aged 15-49 years and 2,363 eligible adults aged 50 years and older—with approximately 11,611 persons aged 15 years and older expected to participate in the survey.

Table 2.1 Distribution of sampled enumeration areas and households by region

Distribution of sampled enumeration areas and households by region, SHIMS3 2021						
Region	Enumeration Areas			Households		
	Urban	Rural	Total	Urban	Rural	Total
Hhohho	18	39	57	630	1,365	1,995
Lubombo	7	35	42	246	1,224	1,470
Manzini	28	38	66	979	1,331	2,310
Shiselweni	4	31	35	139	1,086	1,225
Total	57	143	200	1,994	5,006	7,000

Appendix A: Sample Design and Weighting provides a more detailed explanation of the sampling and weighting processes.

2.2 ELIGIBILITY CRITERIA, RECRUITMENT, AND CONSENT PROCEDURES

In SHIMS3 2021, individuals aged 15 years and older were eligible to participate in the survey. The consent criteria included:

- Adults^a aged 18 years and older or a child with special circumstances (a minor aged 15-17 years who is married or has a child of their own and is not currently living with parents, or a minor who is the decision maker in a household where there is no identified adult head of household) who slept in the household the night before the survey, whether they were usual residents in the selected household or overnight visitors, who were willing and able to provide verbal consent.

^a Note that for the consent process, the definition of adult is determined by the national age of majority.

- Minors aged 15-17 years who slept in the household the night before, whether they were usual residents in the selected household or overnight visitors, who were willing and able to provide verbal assent, and whose parents or guardians were willing and able to provide verbal permission for their participation.

A survey interviewer administered the informed consent process using electronic consent forms (see Appendix G) in the following order. First, a designated head of household provided verbal consent for the household interview, after which individual household members were rostered. Once the household interview was completed, eligible adults and children with special circumstances could then provide verbal consent for an interview and for participation in the biomarker component of the survey, including HBTC, with return of HIV-testing results during the household visit. Participants had to consent to receipt of their test results in order to participate in the biomarker component of the survey. If an individual did not want to receive his or her HIV test result, this was considered a refusal to participate in the testing portion of the survey. The interviewer also asked participants for verbal consent to store their blood samples in a repository to perform additional tests in the future.

The interviewer asked minors aged 15-17 years for their assent to the interview and biomarker components after permission was granted by their parents or guardians. Although parental consent was required for their participation in the survey, minors aged 15-17 years could receive their HIV testing results without their parents being present.

At each stage of the consent process, the interviewer recorded on the consent form on the tablet whether verbal consent/assent was given, and a printed copy was provided to the participant.

The interviewer assessed the cognitive ability of each potential participant by providing information on survey participation and asking them to summarize their understanding of the purpose of the survey and what the survey involves. Standard operating procedures on eligibility determination process and verification of eligibility criteria were used to guide the interviewers on how to assess the respondent's cognitive ability based on the summary they provide. Persons who were unable to give consent or assent due to cognitive impairment or intellectual disability were not eligible to participate. Individuals with disabilities who were otherwise able to give verbal consent were offered survey participation.

All PHIA survey protocols, consent forms, screening forms, refusal forms, referral forms, recruitment materials, and questionnaires were reviewed and approved by in-country ethics and regulatory bodies, including local institutional reviews boards when available, and the institutional review boards of Columbia University Medical Center, Westat, and the CDC.

2.3 SURVEY IMPLEMENTATION

Training of Field and Laboratory Staff

Survey staff received training on both the contents of the data collection instruments and tablet use. The training curriculum included:

- Scientific objectives of the survey
- Survey design and methods
- Completion of survey forms
- Data collection
- Staff responsibilities
- Recruitment of participants
- Informed consent procedures, including human participants' protection, privacy, and confidentiality
- Blood collection including venipuncture and finger-stick
- Home-based HIV testing and counseling
- Referral of participants to health and social services
- Management and transportation of blood specimens
- Biosafety
- Communication skills
- Protocol deviations, adverse events, and reporting of events
- COVID-19 risk mitigation trainings which included the general COVID-19 introduction and guidance; staff screening, isolation and quarantine procedures (see below).

Laboratory staff were trained in specimen management, including sample processing, labeling, and quality assurance (QA). Central laboratory staff were trained in viral load measurement, HIV confirmatory testing, HIV recency testing using the limiting antigen (LAG) avidity enzyme immunoassay and COVID-19 risk mitigation within the laboratory setting (see below).

COVID-19 Mitigation

Before survey launch, the project team continually monitored the COVID-19 situation in the country and worked with partners to develop guidelines for mitigating risk of COVID-19 transmission during survey implementation. Before fieldwork, the project team took precautions to prioritize the health and well-being of team members, members of surveyed households, and of the greater community where the survey operated. Working in close contact with its partners, the survey team adapted survey-related work to be consistent with rapidly evolving guidance. These approaches included COVID-19 mitigation trainings for survey and laboratory staff, community sensitization materials (with an emphasis on holding outdoor community meetings of 10 or less people with all COVID-19 protocols observed), adjustments to the household entry procedures survey team size, and the best practices for interacting with households, including providing personal protective equipment (PPE) to household members.

Trainings were conducted which emphasized COVID-19 mitigation strategies trainings for survey and laboratory staff. All staff were tested before gathering for the training and were required to submit a symptom screen each day of the training. Staff testing positive attended the training virtually while in isolation.

Survey staff were required to reduce their own coronavirus risk through application of the prevention and control measures that were available at the time. Mitigation measures implemented during fieldwork included consistent use of masks for both survey staff and household participants, testing for SARS COV-2 before training and the start or restart of field work (in case of a pause), participating in daily symptom screening of all staff using a mobile phone app developed for this purpose before they could be cleared for work, submitting to SARS-CoV-2 testing whenever they screened positive for symptoms consistent with COVID-19, close monitoring of quarantine and isolation periods of those infected or that were close contacts of COVID-19 cases, and providing virtual training for those in isolation or quarantine. Field data collection teams and laboratory shifts operated as cohorts, with all members being considered close contacts of each other. The number of staff interacting with each household was minimized, and staff were encouraged to complete survey procedures outdoors or in well ventilated rooms when possible.

Survey Staff

Fieldwork started in May 2021 and was completed in November 2021. At survey launch, the fieldwork was conducted by 20 locally hired field teams with seven members each, including a team supervisor, and six data collectors. The data collectors performed interviews, phlebotomy, and testing and counseling. Each team was supported by two drivers. Field teams included both male and female staff and members spoke the languages used in the areas to which they were deployed.

Overall, a total of 192 field staff comprising of four regional coordinators, four quality control (QC) officers, four information and communications technology officers, 120 data collectors, 20 team supervisors, and 40 drivers participated in data collection. The field teams were supervised by their team supervisors, and regional coordinators, and managed by central staff who guided and oversaw data collection activities, performed quality checks, and provided technical support (Appendix D). Viral load testing staff, laboratory supervisors and laboratory technologists were organized centrally while field laboratory assistants supported field teams. At survey launch, 27 laboratory technologists and three central lab technologists processed samples and performed additional procedures for HIV-1 viral load, CD4 counts, QC, and QA.

Community Sensitization and Mobilization

The survey also employed community mobilization teams to maximize community support and participation before data collection. The teams consisted of five community mobilization coordinators and 400 community mobilizers, managed by an education and community mobilization coordinator. The mobilization began before fieldwork commenced with a high-level national launch meeting that included key national and regional leaders, mass media, and other stakeholders. Community mobilization teams visited each EA before initiation of data collection and partnered with community mobilizers to meet key gatekeepers in the communities (chiefs, local government officials, and religious and community leaders). The mobilization

teams held community sensitization meetings outdoors following national guidelines on gatherings, disseminated written informational materials such as posters, held discussions with community residents, and implemented an appointment setting system as part of the community mobilization strategy.

Supervision

Data-collection teams were continuously overseen by field-based supervisors as well as periodically monitored by national and international teams with representation from collaborating institutions. Monitoring teams visited field teams and regional hubs daily and provided direct supervision as well as verification of results by household revisits. Electronic monitoring forms completed by field monitors on tablets/phones, and survey management forms used by teams for household and individual outcome tracking were also reviewed by monitors for completeness. Field laboratory assistants also supported teams by organizing supplies and transport of blood samples, while regional coordinators supported community-mobilization efforts, provided technical troubleshooting, and checked the quality of household procedures and data collected.

The national and international monitoring teams observed and assessed the quality of survey procedures, including adherence to protocol and standard operating procedures, adherence to COVID-19 mitigation measures, and identified and responded to challenges with data collection. Weekly debriefing sessions were held between field-based supervisors and monitoring teams. Monitoring reports were circulated to collaborating institutions and the SHIMS3 2021 Technical Working Group to respond to any issues.

Electronic Monitoring System

An electronic dashboard system was established to monitor the progression of the survey. The dashboard summarized data uploaded to the PHIA server daily. The dashboard tracked coverage and completion of EAs, sampled households, household response, eligible household members providing consent to the interview, biomarker components of the survey, blood draws, response rates (RRs), and overall progress towards the achievement of the target sample.

Questionnaire Data Collection

Questionnaire and field laboratory data were collected on mobile tablet devices using an application programmed in Census and Survey Processing System (CSPRO) software, an open-source mobile data collection application. The household interview collected information on household residents, assets, economic support, recent deaths, and orphans and vulnerable children (see Appendix E). The individual interview was administered to all participants and included modules on demographic characteristics, sexual and reproductive health, marriage, male circumcision, sexual activity, the HIV testing and treatment history, TB and other health issues, and alcohol use (see Appendix F). Participants who self-reported their HIV-positive status were asked questions about their HIV care experience. Women were interviewed by female staff and men by male staff, whenever possible. The questionnaire was administered in English and siSwati. The local language versions of the questionnaires were reviewed and tested thoroughly for acceptability, feasibility, and flow of questions.

2.4 FIELD-BASED BIOMARKER TESTING

Blood Collection

Qualified survey staff collected blood from consenting participants: approximately 14 mL of venous blood or 1 mL of capillary blood using finger-stick from individuals who either refused to give venous blood or for whom venous blood draw failed.

Blood samples were labeled with a unique barcoded participant identification number and stored in temperature-controlled cooler boxes. At the end of each day, samples were transported to a central laboratory for processing into plasma aliquots and dried blood spots (DBS) and were frozen within 24 hours of blood collection at -20° Celsius. Plasma samples were stored at -80° Celsius.

HIV Home-Based Testing and Counseling

HIV HBTC was conducted in each household in accordance with national guidelines (Figure 2.1). As per these guidelines, the survey used a sequential rapid-testing algorithm in the field.

Determine™ HIV-1/2 (Abbott Molecular Inc., Des Plaines, Illinois, United States) was used as a screening test and Uni-Gold™ (Trinity Biotech, plc., Wicklow, Ireland) as a confirmatory test. Individuals with a nonreactive result on the screening test were reported as HIV negative. Individuals with a reactive screening test underwent subsequent testing with Uni-Gold™. Those with reactive results on both the screening and confirmatory tests were classified as HIV positive. Individuals with a reactive Determine™ test followed by a nonreactive Uni-Gold™ test were immediately retested in parallel in the field. If the results during the parallel testing were also discordant, the individual was classified as inconclusive and referred to a local health facility for repeat testing within 2 weeks as per the national guidelines. Those with an inconclusive or HIV-positive result were given a National Health Referral Form which provided different instructions to the health facility for inconclusive; positive, not on ART; and positive, on ART.

Figure 2.1
Household-based
HIV testing algorithm,
SHIMS3 2021



Participants who tested HIV positive who reported not being on ART were counseled on linkage to a clinic for ART, care and support and were referred to their preferred health facility using a National Health Referral Form completed by field staff. All participants were given information and education materials, which provided them with some basic information on HIV and a list of medical facilities and social services organizations in the community.

If a person who self-reported an HIV-positive status tested HIV negative in the survey, additional testing was performed at the central lab to confirm their status (see below). Once the participant's status was confirmed, survey staff returned to the household after consultation with the MOH to share the results and provide counseling to these participants.

Field QC and proficiency testing

QC using a panel of positive and negative dried tube specimens (DTS) was performed biweekly by field staff performing HIV testing. In addition, QA proficiency testing was conducted during the survey, using a panel of masked HIV-positive and negative DTS. Proficiency in the correct performance and interpretation of the HIV testing algorithm was assessed for each tester.

2.5 LABORATORY-BASED BIOMARKER TESTING

Regional hubs and the Central Laboratory

Four regional hubs for the survey were established nationally for management of field supplies, overnight storage of samples and biological waste management. One central laboratory was chosen for sample processing and more specialized tests. At the central laboratory, trained laboratory technologists performed HIV confirmatory testing, Pima CD4 testing, QA testing, QA discrepancy resolution, and processing of whole blood specimens into plasma aliquots and DBS cards for cold storage.

HIV QA and confirmatory testing: For QA of the HIV rapid testing conducted in the field, the first 25 samples tested by each field tester were retested in the central laboratory using the national HIV rapid-testing algorithm. All specimens that tested HIV positive during HBTC, and those that had confirmed positive rapid test results during QA, underwent confirmatory testing using the Geenius HIV 1/2 Supplemental Assay (Bio-Rad, Hercules, California, United States). A positive Geenius result defined HIV-positive status for the survey.

Central laboratory procedures included HIV viral load testing, HIV TNA PCR for confirmation of status of those who self-reported an HIV-positive status but tested negative in HBTC, HIV recency testing, HIV drug resistance (HIVDR) testing, and long-term storage of samples at -80°C.

For participants who self-reported an HIV-positive status but tested HIV negative at the time of the survey, additional HIV rapid tests were conducted at the central lab (following the same national testing algorithm as used in the field). Additional laboratory-based testing was then conducted using HIV total nucleic acid (TNA) polymerase chain reaction (PCR) for confirmation of the status.

The survey conducted household revisits for investigation of discrepancies between the results of testing in the field and in the laboratory. The specimens collected during the revisit underwent comprehensive retesting in the laboratory. For each case, an analysis of the nature of the discrepancy, and potential sources of error, was performed to define the definitive HIV status for analytical purposes.

CD4 Count Measurement

Blood samples from the participants who tested HIV positive underwent CD4 count measurement at the central laboratory. The measurement was performed using the Pima™ CD4 Analyzer (Abbott Molecular, Inc., Chicago, Illinois, United States, formerly Alere).

Viral Load Testing

The HIV-1 viral load (HIV RNA copies/mL) of all confirmed HIV-positive participants was measured on plasma samples using the COBAS AmpliPrep/Taqman 96 assay on the COBAS AmpliPrep/COBAS TaqMan (CAP/CTM) HIV-1, v2.0 Test (Roche Molecular Diagnostics, Branchburg, New Jersey, United States). In cases where plasma samples were not available, HIV-1 viral load was performed on dried blood spot (DBS) samples using the COBAS AmpliPrep/COBAS TaqMan (CAP/CTM) Free Virus Elution (FVE) Protocol (Roche Molecular Diagnostics, Branchburg, New Jersey, United States). The COBAS AmpliPrep/TaqMan HIV-1 is a nucleic acid amplification test for the quantification of HIV Type 1 (HIV-1) RNA in human plasma or dried blood spots. Specimen preparation was automated using COBAS AmpliPrep with amplification and detection using TaqMan.

Return of CD4 and Viral Load Results

The return-of-results coordinator delivered CD4 and viral load results within 8 to 12 weeks to the health facility chosen by each HIV-positive participant. HIV-positive participants were provided with a National Health Referral Form during HBTC for subsequent retrieval of their results. Survey staff also contacted each participant via mobile phones, informing them that their viral load results were available at the chosen facility and further advising them to seek care and treatment.

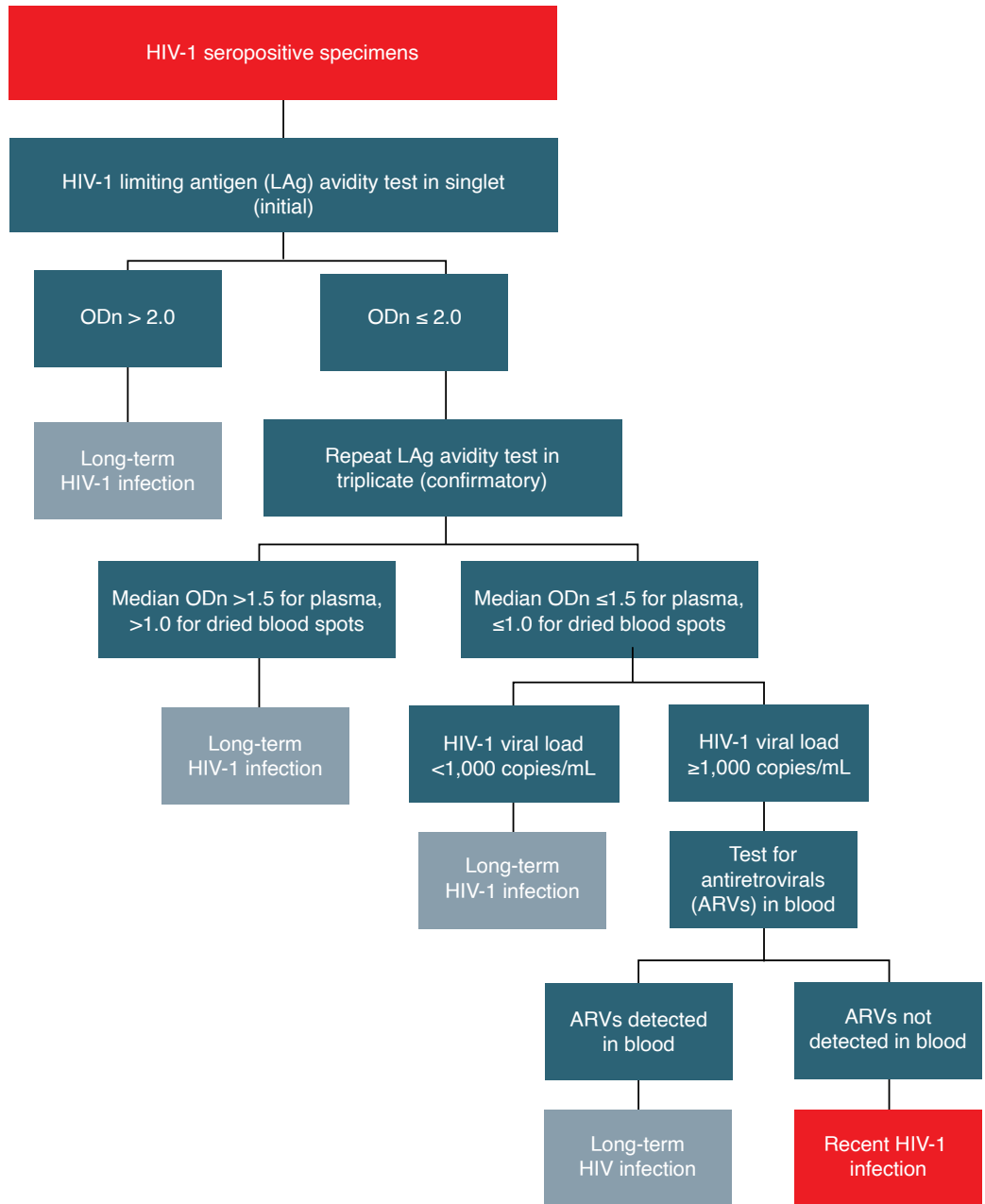
HIV Recent Infection Testing Algorithm

To distinguish recent from long-term HIV infections, in order to estimate incidence, the survey used a laboratory-based testing algorithm that employed a combination of assays: an HIV-1 LAg avidity assay, VL, and ARV detection (Figure 2.2), as described in Appendix B.

Viral load results were assessed on all HIV-positive specimens. Those with viral load < 1,000 copies/mL were classified as long-term infections, while those with viral load \geq 1,000 copies/mL were classified as potential recent infections and LAg avidity assessed. The Sedia HIV-1 LAg-Avidity EIA (Sedia Biosciences Corporation, Portland, Oregon, United States) was used on plasma specimens, while the Maxim HIV-1 Limiting Antigen-Avidity Dried Blood Spot (DBS) EIA (Maxim Biomedical, Bethesda, Maryland, United States) was used on DBS specimens. Plasma specimens with median normalized optical density (ODn) > 1.5, and DBS with a median ODn > 1.0 were classified as long-term infections while plasma specimens with an ODn \leq 1.5 and DBS specimens with median ODn \leq 1.0 were classified as potential recent infections and their ARV detection data were assessed. Those with a detectable ARV were classified as long-term infections and those without were classified as recent infections (Figure 2.2).

Afterwards, LAg avidity testing was performed separately on specimens with a viral load < 1,000 copies/mL but the long-term infection classification was retained for all.

Figure 2.2
 HIV-1 recent infection
 testing algorithm,
 SHIMS3 2021



Abbreviations: mL: milliliter; ODn: normalized optical density; ARV: antiretroviral.

Detection of Antiretroviral Drug Resistance

HIV resistance to ARVs was assessed for HIV-positive participants including recent cases, those without VLS (HIV RNA $\geq 1,000$ copies/mL; both on treatment and not on treatment), and those with a viral load of 200-999 copies/mL. The findings will be released separately.

Detection of Antiretrovirals

Qualitative screening for detectable concentrations of ARVs was conducted on DBS specimens from all HIV-positive participants by means of high-resolution liquid chromatography coupled with tandem mass spectrometry. The method used for ARV detection was a modified version of the methodology described by Koal et al.² This qualitative assay was highly specific, as it separates the parent compound from the fragments, and highly sensitive, with a limit of detection of 0.02 $\mu\text{g/mL}$ for each drug, and a signal-to-noise ratio of at least 5:1 for all drugs. As detection of all ARVs in use at the time of the survey was cost-prohibitive, five ARVs: efavirenz, dolutegravir, atazanavir, nevirapine and lopinavir were selected as markers for the most prescribed first- and second-line regimens in Eswatini. These ARVs were also selected based on their relatively long half-lives, allowing for a longer period of detection following intake.

Detection of ARVs indicates participant use of a given drug at the time of blood collection. Results below the limit of detection among individuals who reported taking ART indicate that there was no recent exposure to the regimen and that adherence to a prescribed regimen is suboptimal, but cannot be interpreted as “not on ART.” In addition, given the limited number of ARVs selected for detection, their absence could not rule out the use of other ART regimens that do not include them.

ARV detection was performed by the CDC in Atlanta.

2.6 DATA PROCESSING AND ANALYSIS

All field data were collected on tablets, transmitted to a central server using a secure virtual private network, and stored in a secure PostgreSQL database. Data cleaning was conducted using SAS 9.4 (SAS Institute Inc. Cary, North Carolina, United States). Laboratory data were cleaned and merged with the final questionnaire database using unique specimen barcodes and study identification numbers.

All results presented in the report are based on weighted estimates unless otherwise noted. Analysis weights account for sample selection probabilities and were adjusted for nonresponse and noncoverage. Nonresponse adjusted weights were calculated for households, individual interviews, and individual blood draws in a hierarchical form. Weighting adjustment cells, defined by a combination of variables that are potential predictors of response, were developed to adjust initial individual and blood-level weights for nonresponse. The nonresponse adjustment cells were constructed using chi-square automatic interaction detection, or the Chi-square Automatic Interaction Detector (CHAID) algorithm. The cells were defined based on data from the household interview for the adjustment of individual-level weights, and from both the household and individual interviews for the adjustment of blood sample-level weights. Post-stratification adjustments were implemented to compensate for noncoverage in the sampling process. This final adjustment calibrated the nonresponse-adjusted individual and blood weights to make the sum of each set of weights conform to national population totals by sex and 5-year age groups. Descriptive analyses of RR, characteristics of respondents, and other indicators were conducted using SAS 9.4.

Incidence estimates were based on the number of HIV infections identified as recent with the HIV-1 LAg avidity plus viral load and ARV detection algorithm, and obtained using the formula recommended by the WHO Incidence Working Group and Consortium for Evaluation and Performance of Incidence Assays, and with assay performance characteristics of a mean duration of recent infection = 130 days (95% CI: 118, 142), a time cutoff = 1.0 year and percentage false recent = 0.00.³ In this report, denominators for a characteristic in a table may differ from the overall table totals due to nonresponse, missing data, and conditional responses. Also, unless otherwise noted in the report, comparisons between estimates were based upon nonoverlapping 95% CIs. Note that CIs are not shown in most of the report tables. However, the public-use data package will provide instructions to calculate the CIs, once it is available on the [PHIA website](#).

Where applicable, the UNAIDS and PEPFAR indicators (that were in effect when the survey concluded) corresponding to a given table are specified at the end of the table. The UNAIDS Global Monitoring indicators refer to the 2021 release of the indicators, available at: <https://www.aidsdatahub.org/sites/default/files/resource/unaid-global-aids-monitoring-2021.pdf> (Accessed August 11, 2023) and the 2021 Monitoring, Evaluation, and Reporting (MER) indicators available at: <https://www.state.gov/wp-content/uploads/2019/10/PEPFAR-MER-Indicator-Reference-Guide-Version-2.4-FY20.pdf> (Accessed August 11, 2023).

2.7 RESPONSE RATES

Household RRs were calculated using the American Association for Public Opinion Research Response Rate 4 method⁴ as the number of complete and incomplete household interviews among all eligible households and those estimated to be eligible among those with unknown eligibility (households not located, not attempted, or unreachable). Vacant and destroyed households, nonresidential units, and household units with no eligible respondents were considered not eligible and excluded from the calculation.

Individual interview RRs were calculated as the number of individuals who were interviewed divided by the number of individuals eligible to participate in the survey. Blood draw RRs were calculated as the number of individuals who provided blood divided by the number of individuals who were interviewed. All RRs presented below are weighted unless otherwise specified.

Of the 7,000 selected households, 6,485 were occupied, and of those, 5,413 were interviewed. The overall household RR (unweighted) was 83.2%. After adjusting for differential sampling probabilities and nonresponse, the overall weighted household RR was 82.8% (Table 2.2).

A total of 14,010 individuals (6,313 men and 7,697 women) were eligible to participate in the survey. A total of 12,043 adults participated in the individual interview: interview RRs were 80.4% among men and 90.8% among women. Among those interviewed, 91.2% of men and 92.8% of women also had their blood drawn (Table 2.3).

Table 2.2 Household response rates

Number of households selected, occupied, and interviewed and household response rates (unweighted and weighted), by residence, SHIMS3 2021			
Result	Residence		Total
	Urban	Rural	
Household interviews			
Households selected	1,994	5,006	7,000
Households occupied	1,828	4,657	6,485
Households interviewed	1,393	4,020	5,413
Household response rate ¹ (unweighted)	75.9	86.0	83.2
Household response rate ¹ (weighted)	77.5	86.1	82.8

¹ Household response rate was calculated using the American Association for Public Opinion Research (AAPOR) Response Rate 4 (RR4) method: <https://aapor.org/wp-content/uploads/2023/05/Standards-Definitions-10th-edition.pdf>.

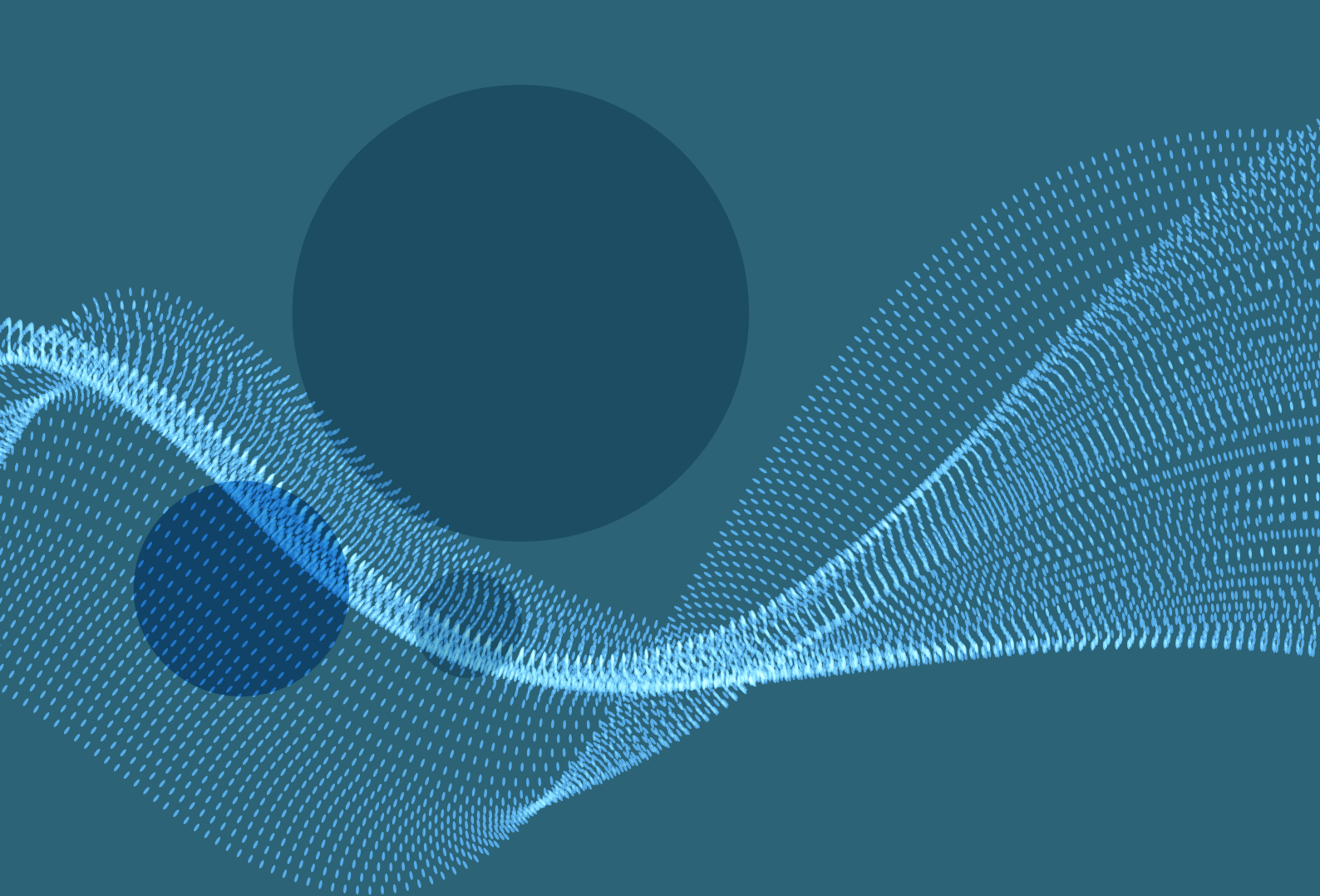
Table 2.3 Individual interview and blood draw response rates

Result	Residence				Total by sex		Total
	Urban		Rural		Men	Women	
	Men	Women	Men	Women			
Eligible individuals, ages 15-24 years							
Number of eligible individuals	322	378	1,861	1,818	2,183	2,196	4,379
Interview response rate (unweighted)	85.7	91.8	80.9	87.6	81.6	88.3	85.0
Interview response rate (weighted)	85.8	91.8	80.9	87.5	82.0	88.7	85.4
Blood draw response rate (unweighted)	93.8	90.8	95.2	95.2	95.0	94.4	94.7
Blood draw response rate (weighted)	93.5	90.3	95.3	95.2	94.8	93.8	94.3
Eligible individuals, ages 15-49 years							
Number of eligible individuals	1,068	1,255	4,133	4,598	5,201	5,853	11,054
Interview response rate (unweighted)	82.2	90.8	78.2	89.6	79.1	89.9	84.8
Interview response rate (weighted)	81.9	91.2	78.2	89.6	79.4	90.1	85.1
Blood draw response rate (unweighted)	87.2	89.3	92.9	94.6	91.7	93.4	92.7
Blood draw response rate (weighted)	86.8	88.9	92.7	94.5	90.8	92.6	91.8
Eligible individuals, ages 15+ years							
Number of eligible individuals	1,211	1,452	5,102	6,245	6,313	7,697	14,010
Number of interviewed individuals	1,004	1,317	4,054	5,668	5,058	6,985	12,043
Number of individuals with blood draw	885	1,166	3,769	5,379	4,654	6,545	11,199
Interview response rate (unweighted)	82.9	90.7	79.5	90.8	80.1	90.7	86.0
Interview response rate (weighted)	82.6	91.0	79.4	90.7	80.4	90.8	86.1
Blood draw response rate (unweighted)	88.1	88.5	93.0	94.9	92.0	93.7	93.0
Blood draw response rate (weighted)	87.8	88.2	92.7	94.8	91.2	92.8	92.1
Overall response rate (unweighted) ³	55.5	61.0	63.6	74.1	61.3	70.7	66.5

¹ Interview response rate = number of individuals interviewed/number of eligible individuals.
² Blood draw response rate = number of individuals who provided blood/number of individuals interviewed.
³ Overall response rate = household response rate * interview response rate * blood draw response rate.

2.8 REFERENCES

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3. SURVEY HOUSEHOLD CHARACTERISTICS

3.1 BACKGROUND

This chapter presents characteristics of households surveyed in SHIMS3 2021. Household composition is described in terms of sex of the head of household, as well as the size of the household. The age structure of the de facto household population (ie, persons who slept in the household the night before the survey) is described by sex as well as urban/rural residence. This chapter also describes the prevalence and composition of households impacted by HIV, which are households with one or more HIV-positive members.

3.2 RESULTS

The following tables and figures describe household characteristics.

Table 3.1 Household composition

Percent distribution of households by sex of head of household; median (quartile 1, quartile 3 [Q1, Q3]) size of household and median (Q1, Q3) number of children under 18 years of age by residence, SHIMS3 2021						
Characteristic	Residence				Total	
	Urban		Rural		Percent	Number
	Percent	Number	Percent	Number		
Head of household						
Male	46.2	649	41.7	1,681	43.5	2,330
Female	53.8	744	58.3	2,338	56.5	3,082
Total	100.0	1,393	100.0	4,019	100.0	5,412
Characteristic	Residence				Total	
	Urban		Rural		Median	Q1, Q3
	Median	Q1, Q3	Median	Q1, Q3		
Size of households	2	1, 4	5	3, 7	4	2, 6
Number of children under 18 years of age	0	0, 2	2	0, 3	1	0, 3

Table 3.2 Distribution of de facto household population (population pyramid)

Percent distribution of the de facto household population by 5-year age groups and sex, SHIMS3 2021						
Age (years)	Men		Women		Total	
	Percent	Number	Percent	Number	Percent	Number
0-4	5.6	1,255	6.1	1,376	11.8	2,631
5-9	5.6	1,295	6.0	1,345	11.6	2,640
10-14	5.6	1,297	6.1	1,390	11.6	2,687
15-19	5.2	1,210	5.2	1,172	10.4	2,382
20-24	4.5	975	4.9	1,026	9.4	2,001
25-29	3.9	822	4.8	984	8.7	1,806
30-34	3.4	695	4.3	899	7.7	1,594
35-39	3.1	648	3.8	774	7.0	1,422
40-44	2.4	485	2.7	547	5.1	1,032
45-49	1.8	368	2.1	453	4.0	821

Table 3.2 Distribution of de facto household population (population pyramid) (continued)

Age	Men		Women		Total	
	Percent	Number	Percent	Number	Percent	Number
50-54	1.2	257	1.8	403	3.0	660
55-59	1.0	219	1.8	407	2.8	626
60-64	1.1	253	1.3	306	2.4	559
65-69	0.6	139	1.0	235	1.6	374
70-74	0.5	120	0.8	182	1.3	302
75-79	0.2	57	0.6	131	0.8	188
80+	0.3	67	0.7	180	1.0	247
Total	46.1	10,162	53.9	11,810	100.0	21,972

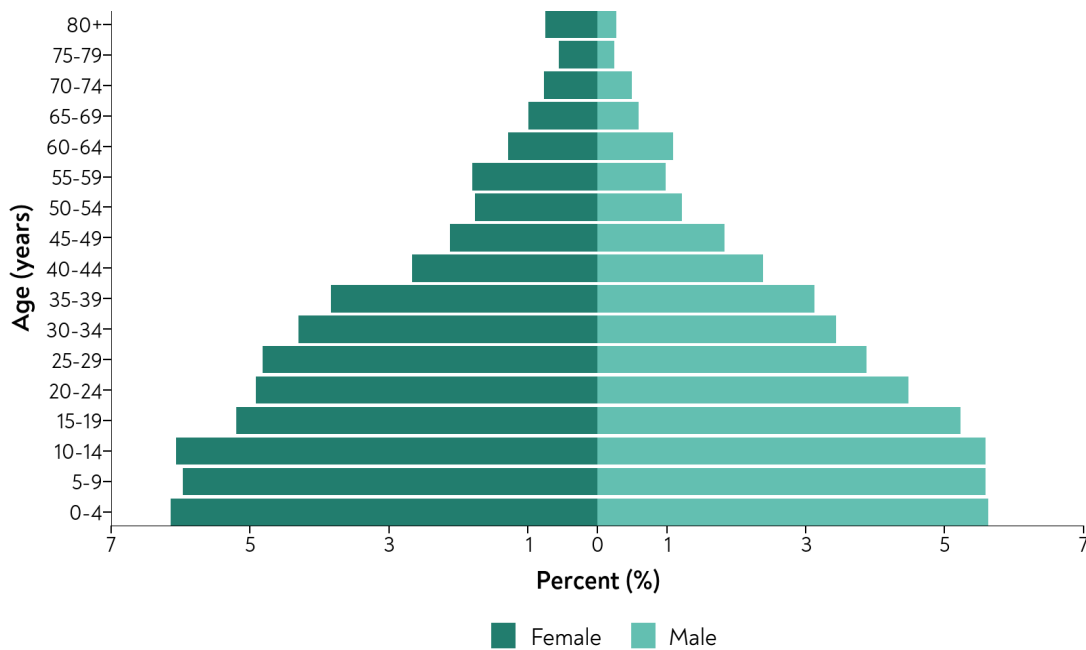


Figure 3.2
Distribution of the de facto population by sex and age, SHIMS3 2021

Table 3.3 Household population by age, sex, and residence

Percent distribution of the household population by age, sex, and residence, SHIMS3 2021						
Age	Urban					
	Men		Women		Total	
	Percent	Number	Percent	Number	Percent	Number
0-4	11.0	183	10.1	204	10.5	387
5-14	16.9	295	16.7	329	16.8	624
15-49	63.7	1,068	63.8	1,256	63.8	2,324
50+	8.4	143	9.4	197	8.9	340
Total	100.0	1,689	100.0	1,986	100.0	3,675

Age	Rural					
	Men		Women		Total	
	Percent	Number	Percent	Number	Percent	Number
0-4	12.6	1,072	11.9	1,172	12.2	2,244
5-14	26.9	2,297	24.4	2,406	25.5	4,703
15-49	49.0	4,135	47.2	4,599	48.0	8,734
50+	11.5	969	16.6	1,647	14.2	2,616
Total	100.0	8,473	100.0	9,824	100.0	18,297

Figure 3.3
Household population by age, sex, and residence, SHIMS3 2021

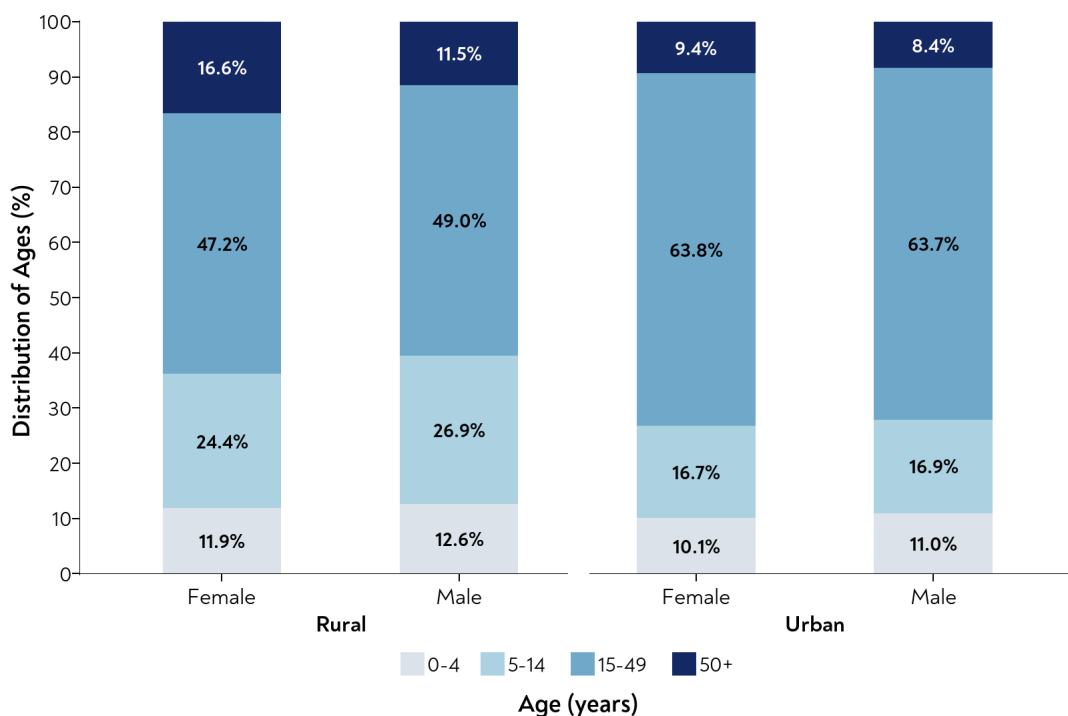
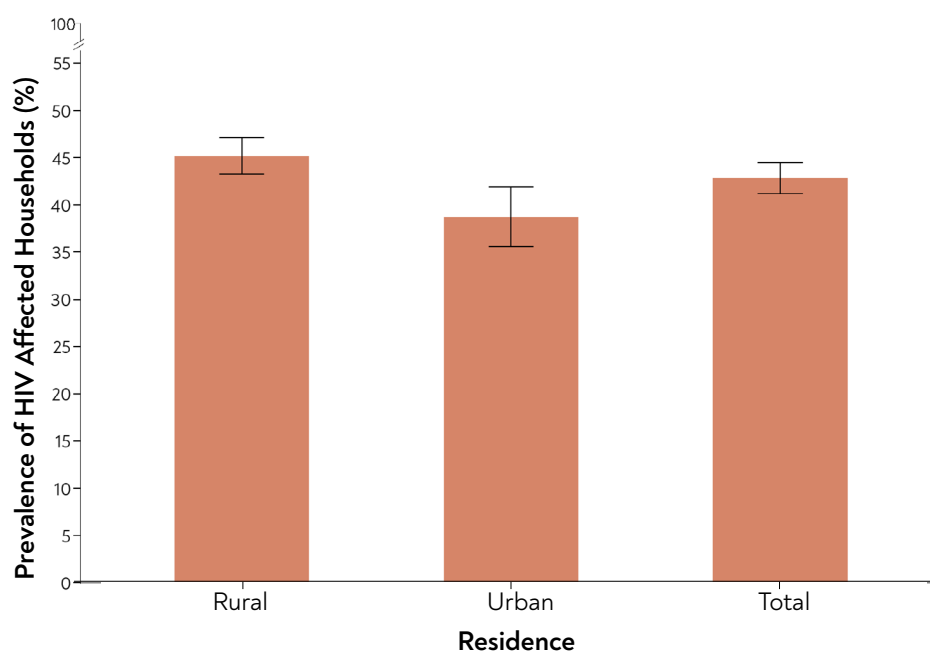


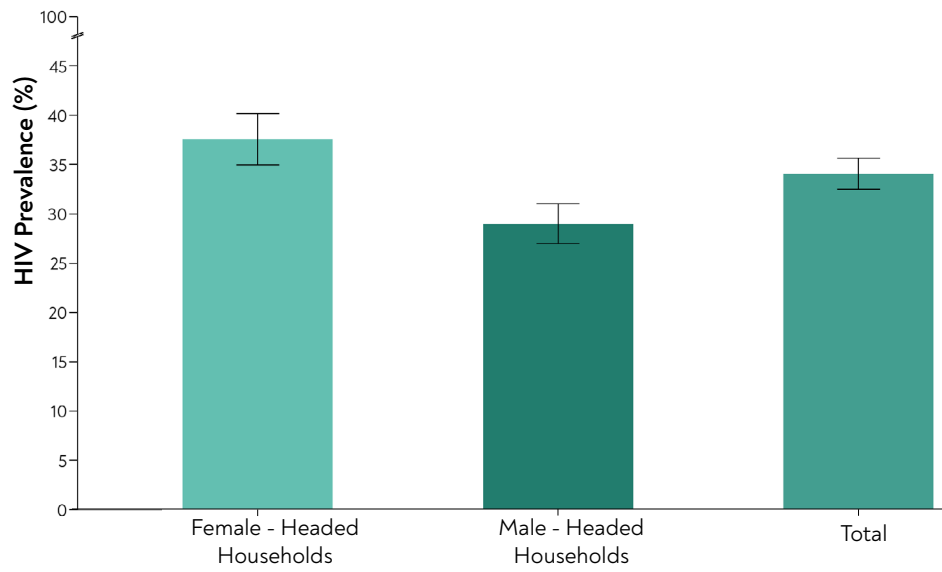
Table 3.4 Prevalence of HIV-affected households

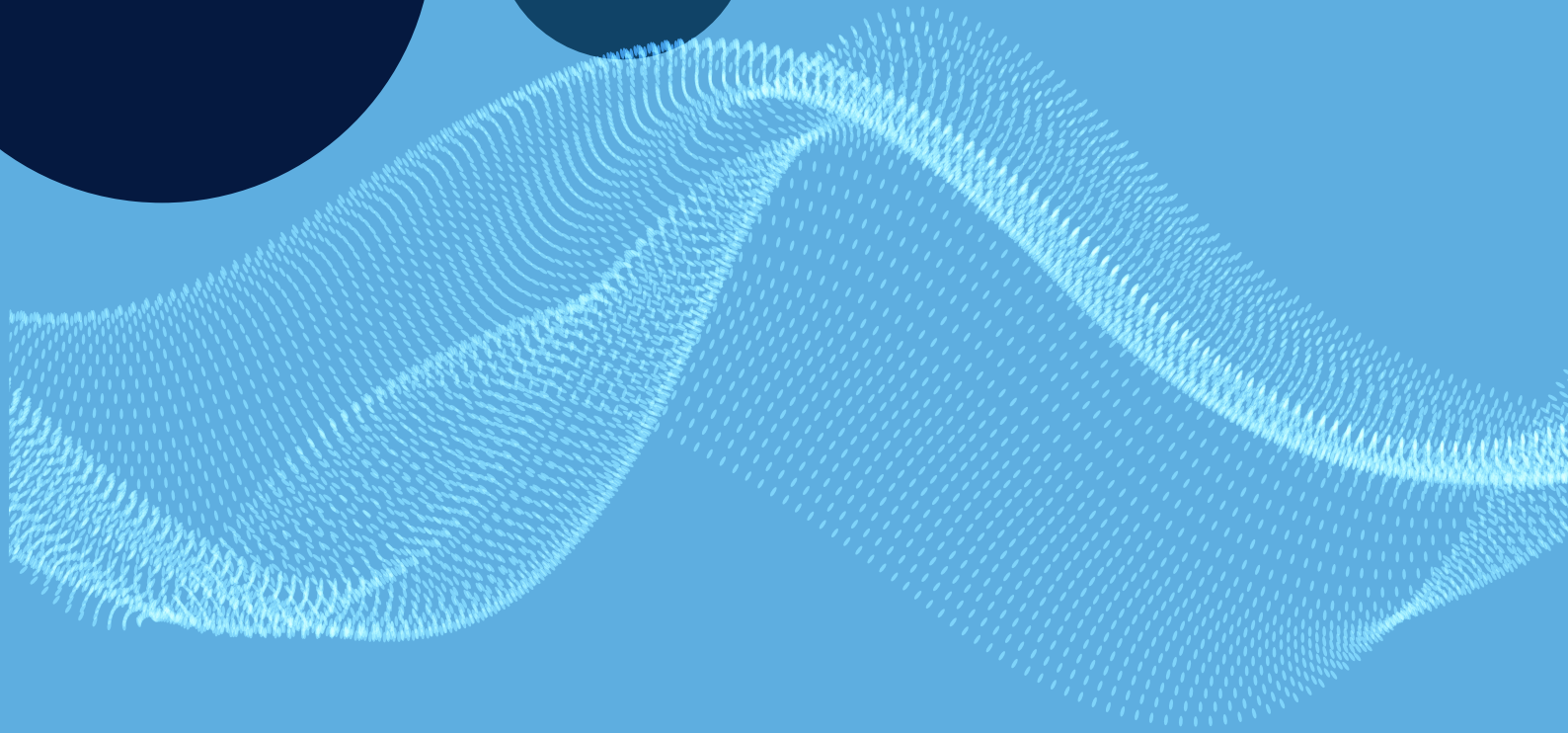
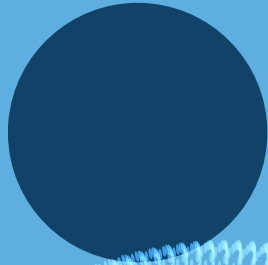
Percentage of households with at least one HIV-positive household member by residence, SHIMS3 2021		
Residence	Percent	Number
Urban	38.8	1,248
Rural	45.2	3,855
Total	42.8	5,103

**Figure 3.4**
Prevalence of HIV-affected households by residence, SHIMS3 2021**Table 3.5 Prevalence of households with an HIV-positive head of household**

Percentage of households with an HIV-positive head of household by sex of head of household, SHIMS3 2021		
Sex of head of household	Percent	Number
Male	29.0	1,876
Female	37.6	2,781
Total	34.1	4,657

Figure 3.5
Prevalence of HIV
among heads of
households, by sex,
SHIMS3 2021





4. SURVEY POPULATION CHARACTERISTICS

4.1 BACKGROUND

SHIMS3 2021 assessed key indicators and outcomes for adults (defined as those aged 15 years and older). To provide context for these outcomes, this chapter summarizes the basic demographic and socioeconomic characteristics of the survey population. Most key indicators in this report are stratified according to these characteristics.

4.2 RESULTS

Table 4.1 presents the demographic characteristics of the population in SHIMS3 2021.

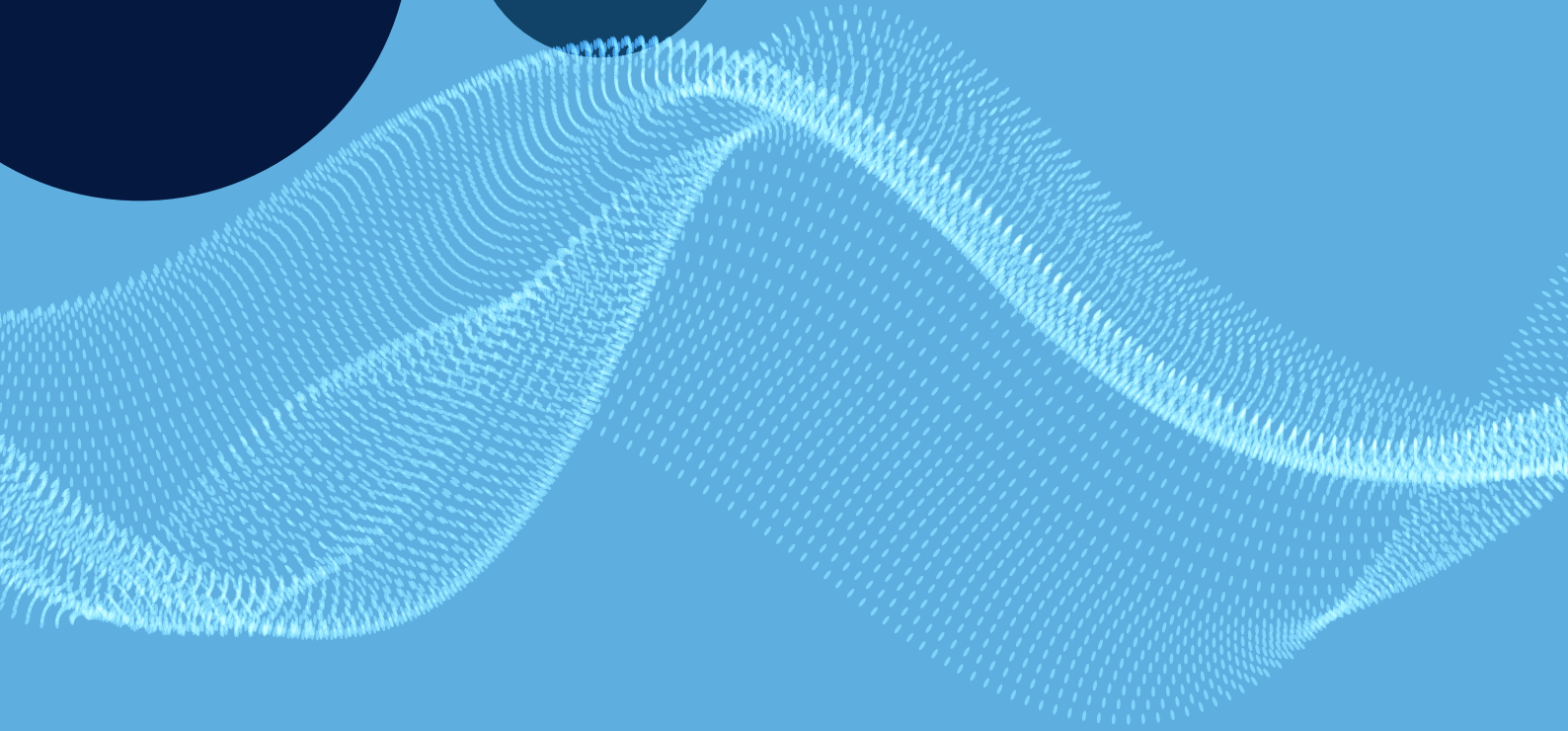
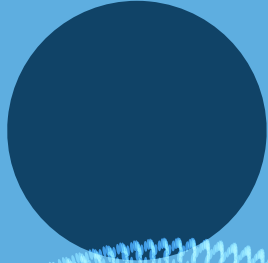
Table 4.1 Demographic characteristics of the adult population

Percent distribution of the population aged 15 years and older by sex and selected demographic characteristics, SHIMS3 2021						
Characteristic	Men		Women		Total	
	Percent	Number	Percent	Number	Percent	Number
Residence						
Urban	29.9	1,004	29.3	1,317	29.6	2,321
Rural	70.1	4,054	70.7	5,668	70.4	9,722
Region						
Hhohho	26.3	1,374	25.0	1,781	25.6	3,155
Lubombo	20.0	1,023	19.7	1,486	19.8	2,509
Manzini	36.4	1,668	37.5	2,319	37.0	3,987
Shiselweni	17.3	993	17.8	1,399	17.5	2,392
Marital status						
Never married	56.9	2,878	48.2	3,125	52.3	6,003
Married or living together	36.1	1,784	33.9	2,547	35.0	4,331
Divorced or separated	5.2	261	6.2	391	5.7	652
Widowed	1.8	103	11.8	880	7.0	983
Education						
No education	5.2	286	7.5	587	6.4	873
Primary	22.9	1,230	22.1	1,651	22.5	2,881
Secondary	58.1	2,912	56.4	3,876	57.2	6,788
More than secondary	13.8	627	14.0	858	13.9	1,485
Wealth quintile						
Lowest	19.9	1,137	21.2	1,671	20.6	2,808
Second	23.9	1,309	22.8	1,782	23.3	3,091
Middle	20.8	1,081	19.8	1,412	20.2	2,493
Fourth	16.6	754	17.8	1,096	17.2	1,850
Highest	18.9	776	18.5	1,024	18.7	1,800

Table 4.1 Demographic characteristics of the adult population (continued)

Percent distribution of the population aged 15 years and older by sex and selected demographic characteristics, SHIMS3 2021						
Characteristic	Men		Women		Total	
	Percent	Number	Percent	Number	Percent	Number
Age (years)						
15-19	18.2	989	16.0	1,022	17.0	2,011
20-24	15.8	792	14.2	918	15.0	1,710
25-29	13.0	634	12.5	873	12.7	1,507
30-34	11.2	521	11.1	812	11.1	1,333
35-39	10.0	500	9.6	712	9.8	1,212
40-44	8.3	376	8.0	504	8.1	880
45-49	6.0	300	6.0	420	6.0	720
50-54	4.7	212	5.1	379	4.9	591
55-59	3.6	183	4.5	385	4.1	568
60-64	2.9	221	3.7	300	3.3	521
65+	6.4	330	9.2	660	7.8	990
Total 15-24	34.0	1,781	30.2	1,940	32.0	3,721
Total 15-49	82.4	4,112	77.5	5,261	79.8	9,373
Total 50+	17.6	946	22.5	1,724	20.2	2,670
Total 15+	100.0	5,058	100.0	6,985	100.0	12,043

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.



5. HIV INCIDENCE

5.1 BACKGROUND

HIV incidence, the measure of new HIV infections in a population over time, provides important information on the status of the HIV epidemic. It can be used for effective targeted HIV prevention planning in groups that are most vulnerable to recent infection and to measure the impact of HIV prevention programs. This chapter presents annual estimates of HIV incidence among adults (ages 15 years and older) at the national level. For the purposes of this analysis, HIV incidence is expressed as the cumulative incidence or risk of new infections in a 12-month period, which is a close approximation to the instantaneous incidence rate. It is important to note that SHIMS3 2021 was not powered to estimate incidence at the regional level or across different sub-groups.

A laboratory-based incidence testing algorithm (HIV-1 LAg avidity plus viral load and ARV detection) was used to distinguish recent from long-term infection, and incidence estimates were obtained using the formula recommended by the WHO Incidence Working Group and Consortium for Evaluation and Performance of Incidence Assays, and with assay performance characteristics of a mean duration of recent infection = 130 days (95% CI: 118, 142), with time cutoff = 1.0 year and residual proportion false recent = 0.00. Survey weights are utilized for all estimates. All HIV-positive participants were tested for recent infection using HIV-1 LAg avidity assay.

Incidence estimation is based on recent/long-term classification by the recent infection algorithm using limiting antigen (LAg) avidity to identify potential recent infections.^{1,2,3} The algorithm uses viral load testing to exclude specimens with low viral load and limit misclassification of persons as recent infections who are elite controllers* or on effective ART. The algorithm uses ARV detection to exclude specimens with high viral load and limit misclassification as recent infections of persons with longstanding infection who are on ART but have drug resistance or poor treatment adherence.⁴

5.2 RESULTS

Table 5.1 reports estimated HIV incidence. Table 5.2 presents estimates for the total number of new infections among adults using the recent infection algorithm, as well as the total number of adults living with HIV using prevalence estimates in Chapter 6.

Table 5.1 Annual HIV incidence using the recent infection testing algorithm

Annual incidence of HIV among adults aged 15-49 years and 15 years and older, by sex and age, using the recent infection testing algorithm (limiting antigen plus viral load plus antiretroviral biomarker testing), SHIMS3 2021						
Age (years)	Men		Woman		Total	
	Percentage annual incidence ¹	95% CI	Percentage annual incidence ¹	95% CI	Percentage annual incidence ¹	95% CI
15-24	0.17	(0.00-0.50)	1.63	(0.43-2.81)	0.86	(0.26-1.45)
25-34	0.38	(0.00-1.13)	1.90	(0.45-3.33)	1.05	(0.29-1.81)
35-49	0.00	(0.00-1.54)	0.42	(0.00-1.24)	0.19	(0.00-0.57)
50+	0.00	(0.00-1.74)	0.00	(0.00-0.86)	0.00	(0.00-0.58)
15-49	0.20	(0.00-0.48)	1.45	(0.69-2.20)	0.77	(0.39-1.15)
15+	0.17	(0.00-0.41)	1.11	(0.53-1.68)	0.62	(0.31-0.93)

¹ Relates to Global AIDS Monitoring 2021 indicator 3.1: HIV incidence.

* Elite controllers are a small subset of people living with HIV whose immune systems are able to maintain viral load suppression for years without treatment.

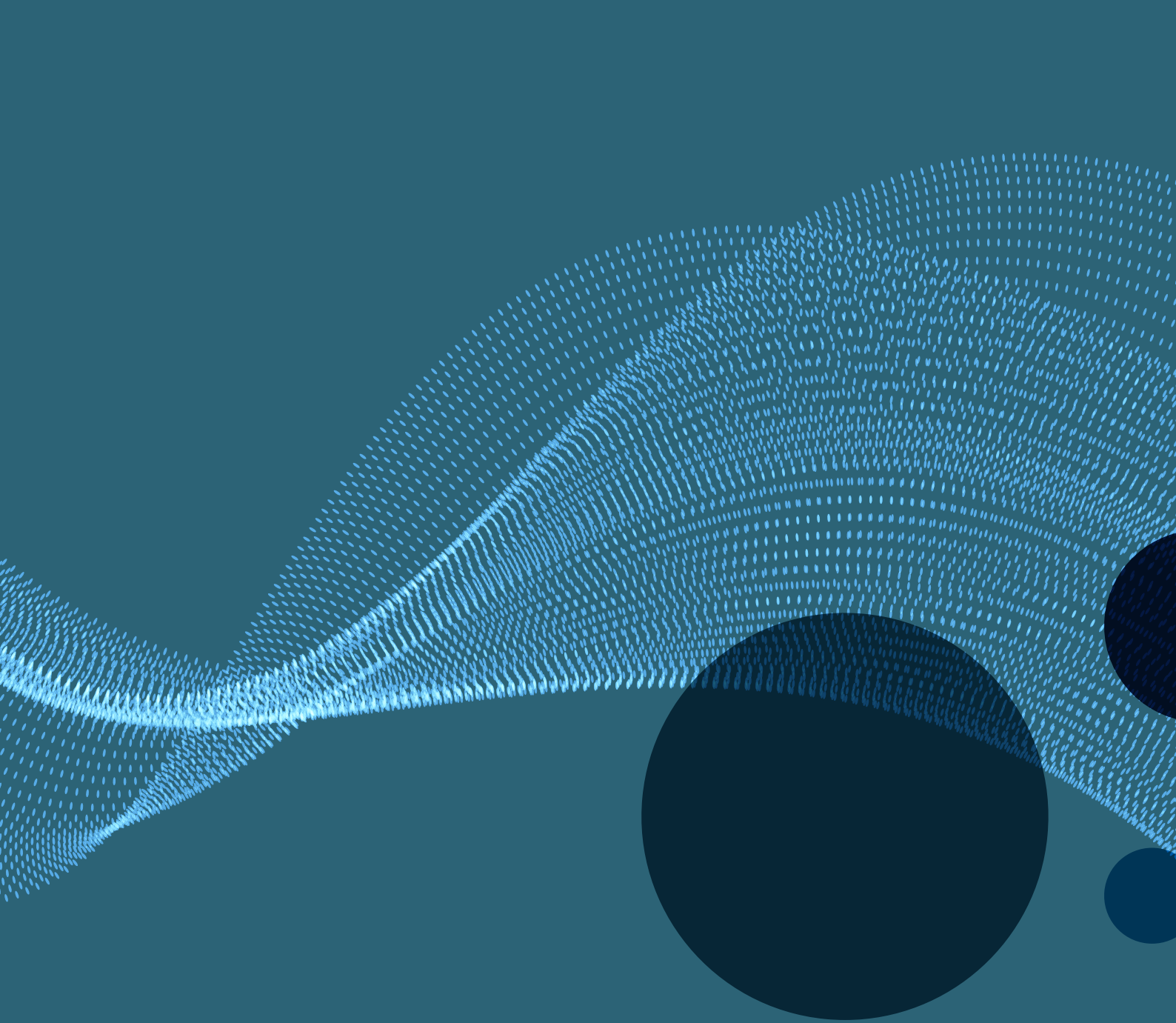
Table 5.2 Adults living with HIV and number of new HIV infections per year using the recent infection testing algorithm

People living with HIV and number of new HIV infections per year among adults aged 15-49 years and 15 years and older, by age, using the recent infection testing algorithm (limiting antigen plus viral load plus antiretroviral biomarker testing), SHIMS3 2021				
Age	People living with HIV ¹	95% CI	Number of new HIV infections per year	95% CI
15-24	17,000	(15,000-19,000)	2,000	(1,000-3,000)
25-34	43,000	(40,000-47,000)	1,000	(0-2,000)
35-49	81,000	(76,000-85,000)	0	(0-1,000)
50+	44,000	(40,000-47,000)	0	(0-1,000)
15-49	141,000	(134,000-148,000)	4,000	(2,000-5,000)
15+	185,000	(177,000-193,000)	4,000	(2,000-5,000)

¹ People living with HIV is calculated as the weighted total number of HIV positive people, equivalent to multiplying the HIV prevalence by the population count. Please note that these estimates are rounded to the nearest thousand.

5.3 REFERENCES

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6. HIV PREVALENCE

6.1 BACKGROUND

This chapter presents representative estimates of HIV prevalence among adults aged 15 years and older at the national and regional level by selected demographic and behavioral characteristics. It also presents estimates of the number of people living with HIV in Eswatini. HIV testing was conducted in each household using a serological rapid diagnostic testing algorithm based on Eswatini's national guidelines, with laboratory confirmation of seropositive samples using a supplemental assay. Appendix B describes the PHIA HIV testing methodology.

6.2 RESULTS

The following tables and figures report estimated HIV prevalence data by demographic characteristics.

Table 6.1 HIV prevalence by demographic characteristics: Adults aged 15-49 years

Prevalence of HIV among adults aged 15-49 years by sex and selected demographic characteristics, SHIMS3 2021						
Characteristic	Men		Women		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
Residence						
Urban	17.3	766	34.0	1,018	26.0	1,784
Rural	14.9	3,005	30.4	3,897	22.7	6,902
Region						
Hhohho	12.2	1,021	27.6	1,258	19.8	2,279
Lubombo	17.8	776	30.4	1,061	24.1	1,837
Manzini	16.4	1,253	33.6	1,649	25.3	2,902
Shiselweni	16.8	721	34.3	947	25.8	1,668
Marital status						
Never married	8.2	2,589	22.7	2,692	15.1	5,281
Married or living together	29.7	965	39.0	1,792	34.8	2,757
Divorced or separated	34.5	184	55.9	271	46.3	455
Widowed	*	10	72.8	131	72.5	141
Education						
No education	37.2	117	63.2	164	50.5	281
Primary	22.1	846	44.6	915	32.5	1,761
Secondary	14.4	2,358	30.0	3,194	22.4	5,552
More than secondary	7.5	450	18.2	639	13.2	1,089
Wealth quintile						
Lowest	18.8	855	36.7	1,128	27.9	1,983
Second	14.5	989	31.7	1,212	22.7	2,201
Middle	15.8	832	36.5	1,027	26.0	1,859
Fourth	15.7	561	28.8	834	22.9	1,395
Highest	13.2	533	24.1	714	19.0	1,247
Pregnancy status						
Currently pregnant	NA	NA	30.6	247	NA	NA
Not currently pregnant	NA	NA	31.8	4,561	NA	NA
Total 15-49 years	15.6	3,771	31.6	4,915	23.7	8,686

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

* Estimates based on a very small denominator (less than 25) have been suppressed with an asterisk.

Table 6.2 HIV prevalence by demographic characteristics: Adults aged 15 years and older

Prevalence of HIV among adults aged 15 years and older by sex and selected demographic characteristics, SHIMS3 2021						
Characteristic	Men		Women		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
Residence						
Urban	20.1	885	32.9	1,166	26.7	2,051
Rural	18.1	3,769	29.3	5,379	24.0	9,148
Region						
Hhohho	15.3	1,265	27.6	1,669	21.6	2,934
Lubombo	20.9	969	29.6	1,413	25.3	2,382
Manzini	19.0	1,513	32.0	2,170	26.0	3,683
Shiselweni	20.7	907	31.6	1,293	26.5	2,200
Marital status						
Never married	8.9	2,655	23.4	2,910	15.9	5,565
Married or living together	30.5	1,631	35.3	2,400	32.9	4,031
Divorced or separated	36.3	239	50.3	371	44.2	610
Widowed	38.6	101	33.1	828	33.8	929
Education						
No education	36.6	275	36.1	570	36.3	845
Primary	23.6	1,174	36.2	1,593	30.1	2,767
Secondary	17.4	2,665	30.2	3,648	24.0	6,313
More than secondary	9.5	537	18.2	721	14.0	1,258
Wealth quintile						
Lowest	20.9	1,087	34.1	1,621	28.0	2,708
Second	17.9	1,234	30.3	1,709	24.2	2,943
Middle	19.8	996	34.2	1,336	27.2	2,332
Fourth	18.6	671	28.9	1,018	24.3	1,689
Highest	16.0	665	23.1	861	19.7	1,526
Pregnancy status						
Currently pregnant	NA	NA	30.6	252	NA	NA
Not currently pregnant	NA	NA	30.4	6,184	NA	NA
Total 15+ years	18.7	4,654	30.4	6,545	24.8	11,199

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Figure 6.2.1
HIV prevalence among adults aged 15 years and older by region, SHIMS3 2021

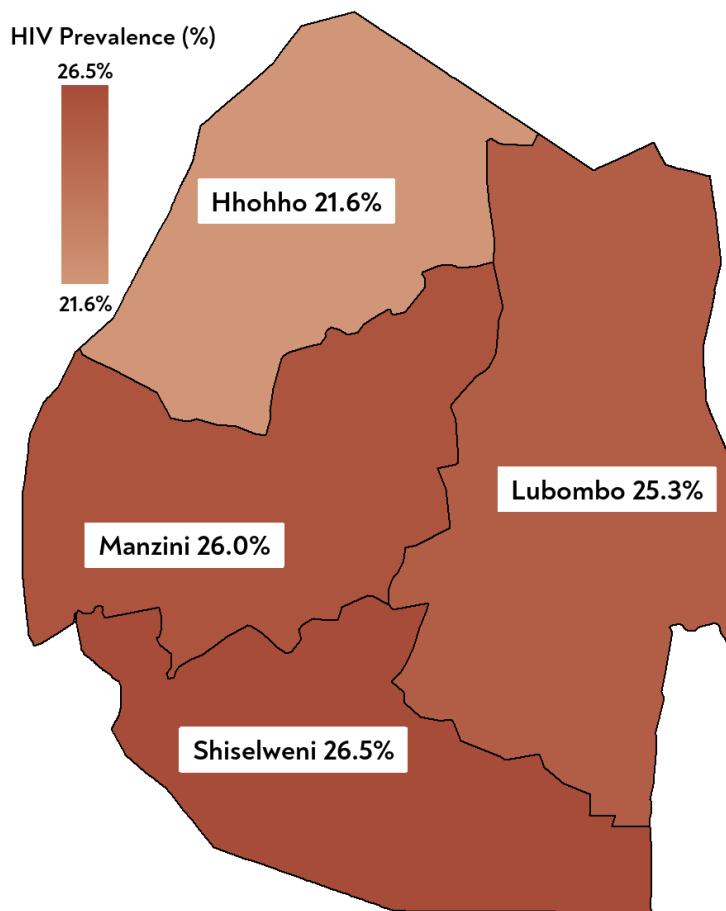


Figure 6.2.2
HIV prevalence among adults aged 15 years and older by region, SHIMS3 2021

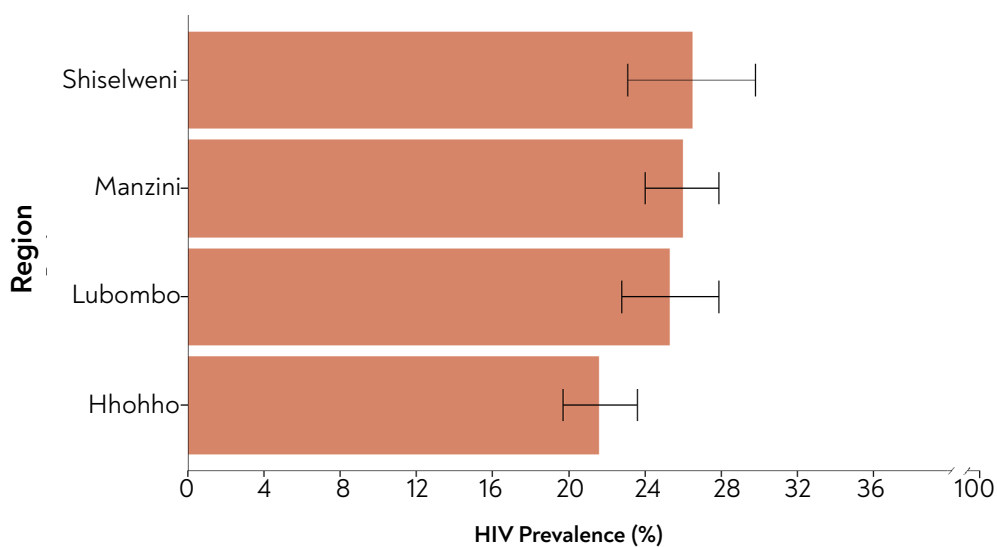
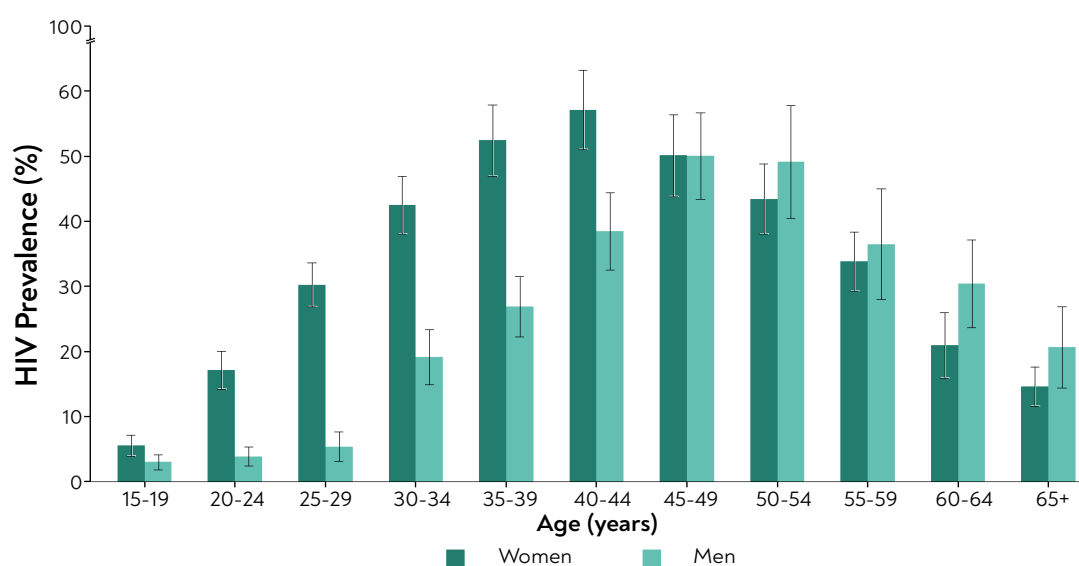


Table 6.3 HIV prevalence by age and sex

Prevalence of HIV among adults aged 15 years and older by sex and age, SHIMS3 2021						
Age (years)	Men		Women		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
15-19	3.0	950	5.6	975	4.3	1,925
20-24	3.9	742	17.2	857	10.5	1,599
25-29	5.4	562	30.3	810	18.2	1,372
30-34	19.2	456	42.5	747	31.3	1,203
35-39	26.9	443	52.5	662	40.0	1,105
40-44	38.5	348	57.2	477	48.1	825
45-49	50.0	270	50.1	387	50.1	657
50-54	49.2	190	43.5	357	46.0	547
55-59	36.5	172	33.8	363	35.0	535
60-64	30.4	209	21.0	285	24.9	494
65+	20.7	312	14.7	625	17.0	937
Total 15-24	3.4	1,692	11.0	1,832	7.2	3,524
Total 15-49	15.6	3,771	31.6	4,915	23.7	8,686
Total 50+	33.1	883	26.1	1,630	29.0	2,513
Total 15+	18.7	4,654	30.4	6,545	24.8	11,199

**Figure 6.3**
HIV prevalence by age and sex, SHIMS3 2021



7. HIV DIAGNOSIS AND TREATMENT

7.1 BACKGROUND

HIV testing is necessary for awareness of HIV status and is an essential component of HIV epidemic control. Becoming aware of one's HIV-positive status is the first step for engaging in HIV care and treatment services. It facilitates access to ART and prevention counseling for both HIV-positive and HIV-negative individuals, reducing the risk of HIV transmission or acquisition. Additionally, it can help individuals access screening services for other comorbidities. While many countries have expanded uptake of HIV testing services, making certain that everyone knows their current HIV status remains a challenge. SHIMS3 2021 gathered data on HIV testing and awareness to help identify gaps in testing uptake, and whether there were subpopulations, such as adolescent girls and young women or men, who may be in need of expanded or community-based HIV testing service options such as self-testing, mobile testing, partner notification/testing, and index case testing.

Once someone has been diagnosed, current guidelines recommend that they immediately be linked to HIV treatment services to start ART as soon as possible.^{1,2} Treating people living with HIV as soon as possible can improve their immune recovery and preserve health, decreasing the risk of opportunistic infections, cancers, and other serious non-AIDS related events and mortality.¹ In addition, it can help them to protect their loved ones from sexual and vertical transmission HIV. In 2016, after an extensive review of evidence of both the clinical and population-level benefits of expanding ART, WHO changed their ART policy recommendations to “Treat All” regardless of CD4 count. By November 2017, all countries in sub-Saharan Africa had adopted this policy, despite the challenges in ensuring uptake and implementation.² This policy was adopted in Eswatini in 2016.³

7.2 RESULTS

Tables 7.1.A-C report on self-reported uptake of testing and receipt of results (ever or within the 12 months before the survey) among men, women, and adults aged 15 years and older by survey HIV test result and other selected characteristics. Figure 7.1 illustrates self-reported testing in the 12 months before the survey in order to understand frequent or recent testing by age and sex.

Tables 7.2.A-C and Figure 7.2 present the proportion of participants who tested positive in SHIMS3 2021 who reported awareness of their status as well as the proportion of those who were aware of their HIV-positive status who reported that they were also on ART.

Note that since participants are sometimes reluctant to reveal their HIV and treatment status in a household survey, SHIMS3 2021 determined whether they were taking ART, by screening their blood for the presence of selected ARVs (efavirenz, nevirapine, atazanavir, lopinavir, and dolutegravir) used in first- and second-line regimens in the country at the time of the survey. Since many tables in this report describe estimates among self-reported people living with HIV without adjustment for ARV detection, Tables 7.3.A-C reports the concordance of self-reported and actual ART use based upon these ARV biomarker data.

Table 7.1.A Self-reported HIV testing: Men

Characteristic	Among all men			Among men who did not report an HIV-positive status		
	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey ¹	Number	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey ¹	Number
Result of SHIMS3 HIV test						
HIV positive	95.6	28.5	833	76.7	42.3	89
HIV negative	87.4	49.3	3,627	87.4	49.3	3,619
Not tested	87.1	52.2	387	85.8	51.8	349
Residence						
Urban	91.3	51.3	975	90.1	56.2	817
Rural	87.7	43.8	3,872	85.7	46.5	3,240
Region						
Hhohho	87.9	43.9	1,325	86.4	47.2	1,133
Lubombo	90.9	51.0	977	89.5	55.4	808
Manzini	88.9	46.6	1,600	86.9	50.1	1,346
Shiselweni	87.3	42.4	945	85.3	44.7	770
Marital status						
Never married	85.8	45.0	2,762	84.8	46.3	2,562
Married or living together	93.2	47.8	1,712	91.6	55.3	1,237
Divorced or separated	92.3	47.9	245	89.1	53.9	170
Widowed	87.3	38.6	98	80.4	49.2	62
Education						
No education	87.2	41.8	262	82.9	50.8	171
Primary	85.9	39.0	1,167	82.9	42.9	922
Secondary	88.5	45.7	2,800	86.7	48.4	2,396
More than secondary	95.2	60.1	615	94.9	61.7	566
Wealth quintile						
Lowest	86.7	40.1	1,074	84.3	43.2	866
Second	88.5	42.8	1,257	86.9	46.2	1,058
Middle	89.4	48.3	1,047	87.5	51.4	870
Fourth	89.7	50.7	717	88.2	54.7	611
Highest	89.6	49.8	751	88.3	52.7	652
Age (years)						
15-19	74.8	26.4	941	74.1	26.8	917
20-24	89.4	52.9	769	89.0	53.5	746
25-29	93.7	60.4	614	93.5	61.3	592
30-34	94.9	60.2	507	94.1	65.8	436
35-39	93.6	51.9	478	92.3	56.7	361
40-44	93.5	42.2	360	90.5	51.5	236
45-49	92.2	41.4	287	89.8	53.1	154

Table 7.1.A Self-reported HIV testing: Men (continued)

Percentage of men aged 15 years and older who reported they had ever received an HIV test, and percentage who reported they had received an HIV test in the 12 months before the survey, by result of SHIMS3 HIV test and selected demographic characteristics, SHIMS3 2021

Characteristic	Among all men			Among men who did not report an HIV-positive status		
	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey ¹	Number	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey ¹	Number
50-54	92.8	42.1	202	91.4	51.8	105
55-59	92.4	43.8	178	88.4	47.6	115
60-64	86.7	34.5	209	82.1	39.1	150
65+	84.2	38.4	302	80.7	41.3	245
Total 15-24	81.7	38.9	1,710	81.1	39.3	1,663
Total 15-49	88.8	47.3	3,956	87.4	50.2	3,442
Total 50+	88.7	39.9	891	84.8	44.4	615
Total 15+	88.8	46.0	4,847	87.0	49.4	4,057

¹Relates to PEPFAR indicator HTS_TST: Number of individuals who received HIV-testing services and received their test results.

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Table 7.1.B Self-reported HIV testing: Women

Percentage of women aged 15 years and older who reported they had ever received an HIV test, and percentage who reported they had received an HIV test in the 12 months before the survey, by result of SHIMS3 HIV test and selected demographic characteristics, SHIMS3 2021

Characteristic	Among all women			Among women who did not report an HIV-positive status		
	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey ¹	Number	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey ¹	Number
Result of SHIMS3 HIV test						
HIV positive	98.5	27.1	1,912	93.3	68.6	107
HIV negative	91.1	63.6	4,300	91.0	63.6	4,293
Not tested	92.5	63.1	423	91.8	67.8	359
Residence						
Urban	93.9	54.0	1,273	91.6	65.4	900
Rural	93.0	52.9	5,362	91.0	63.5	3,859

Table 7.1.B Self-reported HIV testing: Women (continued)

Percentage of women aged 15 years and older who reported they had ever received an HIV test, and percentage who reported they had received an HIV test in the 12 months before the survey, by result of SHIMS3 HIV test and selected demographic characteristics, SHIMS3 2021

Characteristic	Among all women			Among women who did not report an HIV-positive status		
	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey ¹	Number	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey ¹	Number
Region						
Hhohho	92.0	50.0	1,704	89.4	60.5	1,254
Lubombo	93.6	56.7	1,379	92.1	70.1	994
Manzini	93.6	53.8	2,216	91.5	63.6	1,561
Shiselweni	94.1	52.7	1,336	92.0	63.6	950
Marital status						
Never married	90.8	56.4	3,001	88.9	63.9	2,378
Married or living together	97.6	55.4	2,436	96.8	70.5	1,647
Divorced or separated	97.8	47.9	364	95.8	67.6	180
Widowed	88.3	35.0	795	83.6	43.0	525
Education						
No education	88.4	39.7	518	82.2	51.7	326
Primary	92.1	44.6	1,541	88.3	56.6	1,005
Secondary	93.7	56.0	3,733	91.8	66.8	2,715
More than secondary	96.3	61.9	831	95.8	68.1	703
Wealth quintile						
Lowest	92.6	49.8	1,561	89.9	63.4	1,046
Second	94.0	54.3	1,682	92.1	66.5	1,200
Middle	94.6	54.8	1,337	92.4	65.9	906
Fourth	94.2	55.7	1,065	92.7	66.7	799
Highest	90.8	51.7	990	88.9	58.3	808
Age (years)						
15-19	79.9	50.1	976	79.3	50.6	936
20-24	96.7	73.7	901	96.3	79.0	787
25-29	98.4	68.9	842	98.2	81.1	626
30-34	98.5	58.7	786	98.7	82.0	479
35-39	98.6	48.2	684	97.6	72.2	351
40-44	98.7	41.2	481	97.6	59.4	217
45-49	97.2	44.2	401	96.6	66.5	217
50-54	96.9	40.4	366	96.6	53.9	207
55-59	95.4	41.2	358	93.6	50.4	242
60-64	91.0	36.5	273	89.1	42.0	216
65+	81.2	37.3	567	78.1	40.4	481

Table 7.1.B Self-reported HIV testing: Women (continued)

Percentage of women aged 15 years and older who reported they had ever received an HIV test, and percentage who reported they had received an HIV test in the 12 months before the survey, by result of SHIMS3 HIV test and selected demographic characteristics, SHIMS3 2021

Characteristic	Among all women			Among women who did not report an HIV-positive status		
	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey ¹	Number	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey ¹	Number
Total 15-24	87.9	61.4	1,877	87.0	63.5	1,723
Total 15-49	94.3	57.2	5,071	92.5	69.4	3,613
Total 50+	89.5	38.7	1,564	86.5	45.1	1,146
Total 15+	93.3	53.2	6,635	91.2	64.1	4,759

¹Relates to PEPFAR indicator HTS_TST: Number of individuals who received HIV-testing services and received their test results.

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Table 7.1.C Self-reported HIV testing: Total

Percentage of adults aged 15 years and older who reported they had ever received an HIV test, and percentage who reported that they received an HIV test in the 12 months before the survey, by result of SHIMS3 HIV test and selected demographic characteristics, SHIMS3 2021

Characteristic	Among all adults			Among adults who did not report an HIV-positive status		
	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey ¹	Number	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey ¹	Number
Result of SHIMS3 HIV test						
HIV positive	97.5	27.6	2,745	84.9	55.3	196
HIV negative	89.2	56.2	7,927	89.2	56.3	7,912
Not tested	89.7	57.4	810	88.6	59.2	708
Residence						
Urban	92.7	52.7	2,248	90.8	60.6	1,717
Rural	90.4	48.5	9,234	88.3	54.8	7,099
Region						
Hhohho	90.0	47.0	3,029	87.8	53.5	2,387
Lubombo	92.3	53.9	2,356	90.8	62.5	1,802
Manzini	91.4	50.4	3,816	89.2	56.7	2,907
Shiselweni	90.9	47.9	2,281	88.6	54.1	1,720

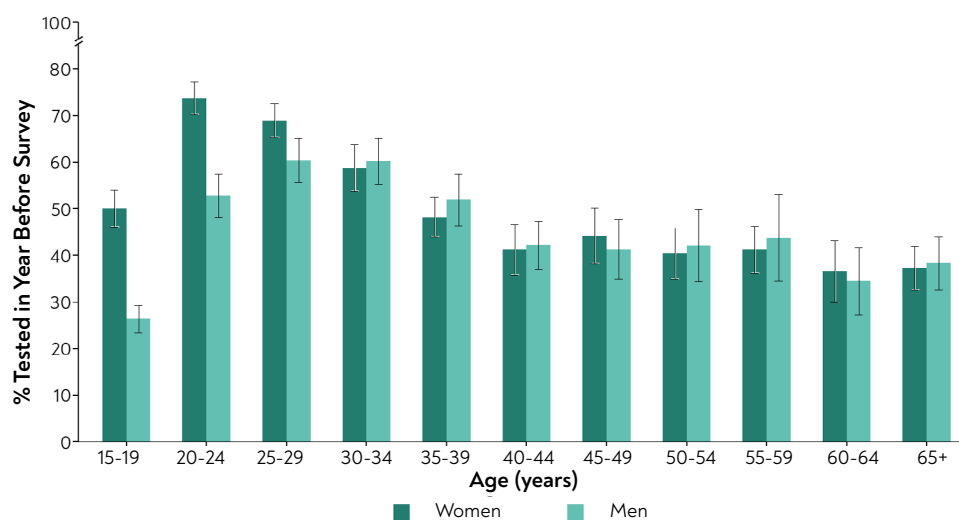
Table 7.1.C Self-reported HIV testing: Total (continued)

Percentage of adults aged 15 years and older who reported they had ever received an HIV test, and percentage who reported that they received an HIV test in the 12 months before the survey, by result of SHIMS3 HIV test and selected demographic characteristics, SHIMS3 2021

Characteristic	Among all adults			Among adults who did not report an HIV-positive status		
	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey ¹	Number	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey ¹	Number
Marital status						
Never married	88.2	50.5	5,763	86.6	54.1	4,940
Married or living together	95.4	51.6	4,148	94.1	62.7	2,884
Divorced or separated	95.4	47.9	609	92.4	60.6	350
Widowed	88.2	35.5	893	83.2	43.8	587
Education						
No education	87.9	40.5	780	82.5	51.3	497
Primary	89.1	41.9	2,708	85.4	49.2	1,927
Secondary	91.1	51.0	6,533	89.2	57.2	5,111
More than secondary	95.7	61.0	1,446	95.3	64.9	1,269
Wealth quintile						
Lowest	89.9	45.3	2,635	87.0	53.1	1,912
Second	91.3	48.6	2,939	89.3	55.7	2,258
Middle	92.0	51.6	2,384	89.8	58.0	1,776
Fourth	92.2	53.4	1,782	90.5	60.8	1,410
Highest	90.2	50.7	1,741	88.6	55.5	1,460
Age (years)						
15-19	77.3	38.1	1,917	76.7	38.5	1,853
20-24	93.0	63.3	1,670	92.4	65.6	1,533
25-29	96.1	64.8	1,456	95.7	70.2	1,218
30-34	96.8	59.4	1,293	96.1	72.9	915
35-39	96.2	50.0	1,162	94.5	63.1	712
40-44	96.2	41.7	841	93.5	54.9	453
45-49	94.8	42.9	688	93.3	60.1	371
50-54	95.1	41.2	568	94.3	53.0	312
55-59	94.1	42.3	536	91.4	49.2	357
60-64	89.2	35.6	482	86.3	40.8	366
65+	82.4	37.7	869	79.1	40.8	726
Total 15-24	84.8	50.0	3,587	83.9	51.0	3,386
Total 15-49	91.6	52.3	9,027	89.7	59.1	7,055
Total 50+	89.2	39.2	2,455	85.8	44.8	1,761
Total 15+	91.1	49.8	11,482	89.0	56.5	8,816

¹ Relates to PEPFAR indicator HTS_TST: Number of individuals who received HIV testing services and received their test results.

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

**Figure 7.1**

Proportion of adults who reported having received an HIV test in the 12 months before the survey, by age and sex SHIMS3 2021

Table 7.2.A HIV diagnosis and treatment status: Men

Percent distribution of HIV-positive men, aged 15 years and older, diagnosed and on treatment based on self-reported HIV status and antiretroviral therapy (ART) use (adjusted by detection of an antiretroviral in blood), by selected demographic characteristics, SHIMS3 2021

Characteristic	Unaware of HIV status	Aware of HIV status and not on ART	Aware of HIV status and on ART ¹	Total	Number
Residence					
Urban	7.2	3.9	88.8	100.0	180
Rural	9.0	3.6	87.4	100.0	695
Region					
Hhohho	5.4	5.2	89.4	100.0	206
Lubombo	7.4	1.7	90.8	100.0	189
Manzini	10.3	4.3	85.4	100.0	288
Shiselweni	9.6	3.4	87.0	100.0	192
Marital status					
Never married	12.2	5.4	82.4	100.0	229
Married or living together	6.5	2.8	90.8	100.0	513
Divorced or separated	10.6	2.7	86.6	100.0	84
Widowed	(5.7)	(7.9)	(86.4)	(100.0)	43
Education					
No education	7.3	2.9	89.8	100.0	101
Primary	5.6	2.5	92.0	100.0	271
Secondary	9.4	4.6	86.0	100.0	447
More than secondary	14.9	3.0	82.1	100.0	55
Wealth quintile					
Lowest	6.5	3.4	90.1	100.0	230
Second	8.5	4.2	87.4	100.0	219
Middle	10.0	4.3	85.6	100.0	195
Fourth	11.9	4.2	83.9	100.0	122
Highest	5.3	2.2	92.5	100.0	108

Table 7.2.A HIV diagnosis and treatment status: Men (continued)

Percent distribution of HIV-positive men, aged 15 years and older, diagnosed and on treatment based on self-reported HIV status and antiretroviral therapy (ART) use (adjusted by detection of an antiretroviral in blood), by selected demographic characteristics, SHIMS3 2021					
Characteristic	Unaware of HIV status	Aware of HIV status and not on ART	Aware of HIV status and on ART ¹	Total	Number
Age (years)					
15-19	(5.9)	(0.0)	(94.1)	(100.0)	28
20-24	(11.6)	(6.3)	(82.1)	(100.0)	28
25-29	(33.6)	(2.9)	(63.5)	(100.0)	33
30-34	22.4	12.1	65.5	100.0	88
35-39	9.7	5.6	84.7	100.0	130
40-44	7.2	2.0	90.8	100.0	138
45-49	3.1	2.1	94.8	100.0	138
50-54	0.9	1.7	97.4	100.0	99
55-59	5.6	1.5	92.9	100.0	65
60-64	5.0	1.9	93.1	100.0	66
65+	2.8	1.6	95.6	100.0	62
Total 15-24	8.9	3.3	87.7	100.0	56
Total 15-49	10.9	4.7	84.5	100.0	583
Total 50+	3.0	1.6	95.3	100.0	292
Total 15+	8.4	3.7	87.8	100.0	875

¹ Relates to Global AIDS Monitoring 2021 Indicator 1.2: People living with HIV on ART; and PEPFAR TX_CURR_NAT / SUBNAT: Percentage of adults and children currently receiving ART.

() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Table 7.2.B HIV diagnosis and treatment status: Women

Percent distribution of HIV-positive women, aged 15 years and older, diagnosed and on treatment based on self-reported HIV status and antiretroviral therapy (ART) use (adjusted by detection of an antiretroviral in blood), by selected demographic characteristics, SHIMS3 2021					
Characteristic	Unaware of HIV status	Aware of HIV status and not on ART	Aware of HIV status and on ART ¹	Total	Number
Residence					
Urban	5.9	2.7	91.5	100.0	391
Rural	4.7	1.4	93.8	100.0	1,621
Region					
Hhohho	5.3	1.5	93.3	100.0	480
Lubombo	5.0	0.9	94.1	100.0	424
Manzini	4.6	2.3	93.1	100.0	697
Shiselweni	6.0	2.3	91.8	100.0	411

Table 7.2.B HIV diagnosis and treatment status: Women (continued)

Percent distribution of HIV-positive women, aged 15 years and older, diagnosed and on treatment based on self-reported HIV status and antiretroviral therapy (ART) use (adjusted by detection of an antiretroviral in blood), by selected demographic characteristics, SHIMS3 2021					
Characteristic	Unaware of HIV status	Aware of HIV status and not on ART	Aware of HIV status and on ART ¹	Total	Number
Marital status					
Never married	7.7	1.8	90.5	100.0	686
Married or living together	3.4	2.4	94.3	100.0	838
Divorced or separated	4.4	0.8	94.8	100.0	198
Widowed	2.0	1.1	96.9	100.0	276
Education					
No education	1.6	1.2	97.2	100.0	203
Primary	3.0	1.2	95.8	100.0	570
Secondary	6.4	2.2	91.4	100.0	1,104
More than secondary	6.9	1.5	91.5	100.0	132
Wealth quintile					
Lowest	4.5	1.1	94.5	100.0	550
Second	3.8	1.2	95.0	100.0	517
Middle	2.5	3.1	94.4	100.0	455
Fourth	7.8	2.9	89.3	100.0	297
Highest	9.1	0.6	90.2	100.0	193
Age (years)					
15-19	19.9	3.4	76.7	100.0	55
20-24	15.0	2.8	82.1	100.0	139
25-29	10.9	3.6	85.5	100.0	251
30-34	3.8	2.7	93.6	100.0	324
35-39	2.6	2.1	95.3	100.0	342
40-44	1.1	1.6	97.3	100.0	278
45-49	1.2	0.0	98.8	100.0	187
50-54	1.2	0.0	98.8	100.0	157
55-59	5.7	0.8	93.6	100.0	127
60-64	5.4	0.0	94.6	100.0	60
65+	2.4	0.0	97.6	100.0	92
Total 15-24	16.4	3.0	80.7	100.0	194
Total 15-49	5.5	2.2	92.3	100.0	1,576
Total 50+	3.2	0.2	96.6	100.0	436
Total 15+	5.1	1.8	93.1	100.0	2,012

¹Relates to Global AIDS Monitoring 2021 Indicator 1.2: People living with HIV on ART and PEPFAR TX_CURR_NAT / SUBNAT: Percentage of adults and children currently receiving ART.

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Table 7.2.C HIV diagnosis and treatment status: Total

Percent distribution of HIV-positive adults, aged 15 years and older, diagnosed and on treatment based on self-reported HIV status and antiretroviral therapy (ART) use (adjusted by detection of an antiretroviral in blood), by selected demographic characteristics, SHIMS3 2021					
Characteristic	Unaware of HIV status	Aware of HIV status and not on ART	Aware of HIV status and on ART ¹	Total	Number
Residence					
Urban	6.4	3.1	90.5	100.0	571
Rural	6.3	2.2	91.5	100.0	2,316
Region					
Hhohho	5.3	2.7	92.0	100.0	686
Lubombo	6.0	1.2	92.8	100.0	613
Manzini	6.5	3.0	90.5	100.0	985
Shiselweni	7.3	2.7	90.0	100.0	603
Marital status					
Never married	9.0	2.8	88.1	100.0	915
Married or living together	4.8	2.5	92.7	100.0	1,351
Divorced or separated	6.6	1.5	91.9	100.0	282
Widowed	2.5	2.1	95.4	100.0	319
Education					
No education	3.8	1.9	94.3	100.0	304
Primary	3.9	1.7	94.3	100.0	841
Secondary	7.4	3.1	89.5	100.0	1,551
More than secondary	9.5	2.0	88.4	100.0	187
Wealth quintile					
Lowest	5.2	1.9	92.9	100.0	780
Second	5.5	2.3	92.2	100.0	736
Middle	5.2	3.6	91.3	100.0	650
Fourth	9.2	3.3	87.4	100.0	419
Highest	7.6	1.2	91.1	100.0	301
Age (years)					
15-19	14.9	2.2	82.9	100.0	83
20-24	14.4	3.5	82.1	100.0	167
25-29	14.2	3.5	82.4	100.0	284
30-34	9.2	5.5	85.3	100.0	412
35-39	4.9	3.2	91.8	100.0	472
40-44	3.5	1.8	94.8	100.0	416
45-49	2.1	1.0	96.9	100.0	325
50-54	1.0	0.8	98.1	100.0	256
55-59	5.6	1.1	93.3	100.0	192
60-64	5.2	1.0	93.8	100.0	126
65+	2.6	0.8	96.6	100.0	154
Total 15-24	14.6	3.1	82.4	100.0	250
Total 15-49	7.3	3.0	89.7	100.0	2,159
Total 50+	3.1	0.9	96.0	100.0	728
Total 15+	6.3	2.5	91.2	100.0	2,887

¹Relates to Global AIDS Monitoring 2021 Indicator 1.2: People living with HIV on ART; and PEPFAR TX_CURR_NAT / SUBNAT: Percentage of adults and children currently receiving ART.

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.



Figure 7.2
Proportion of adults living with HIV who reported awareness of HIV status and antiretroviral therapy use, by sex and age, SHIMS3 2021

Abbreviation: ART, antiretroviral therapy.

Estimates based on a denominator between 25 and 49 are marked by a dagger and should be interpreted with caution.

Table 7.3.A Concordance of self-reported treatment status versus presence of detectable antiretrovirals: Men

Percent distribution of HIV-positive men aged 15 years and older by presence of detectable antiretrovirals (ARVs) versus self-reported HIV treatment status, SHIMS3 2021

Characteristic	ARV status		Total	Number
	Not detectable	Detectable		
Self-reported treatment status				
Not previously diagnosed	76.7	23.3	100.0	90
Previously diagnosed, not on ART	(96.2)	(3.8)	(100.0)	33
Previously diagnosed, on ART	3.0	97.0	100.0	748
Total 15-24 years	24.1	75.9	100.0	56
Total 15-49 years	18.6	81.4	100.0	580
Total 50+ years	5.5	94.5	100.0	292
Total 15+ years	14.5	85.5	100.0	872

() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

Table 7.3.B Concordance of self-reported treatment status versus presence of detectable antiretrovirals: Women

Percent distribution of HIV-positive women aged 15 years and older by presence of detectable antiretrovirals (ARVs) versus self-reported HIV treatment status, SHIMS3 2021

Characteristic	ARV status		Total	Number
	Not detectable	Detectable		
Self-reported treatment status				
Not previously diagnosed	81.3	18.7	100.0	116
Previously diagnosed, not on ART	(77.9)	(22.1)	(100.0)	43
Previously diagnosed, on ART	4.3	95.7	100.0	1,848
Total 15-24 years	30.4	69.6	100.0	193
Total 15-49 years	12.4	87.6	100.0	1,574
Total 50+ years	4.0	96.0	100.0	436
Total 15+ years	10.8	89.2	100.0	2,010

() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

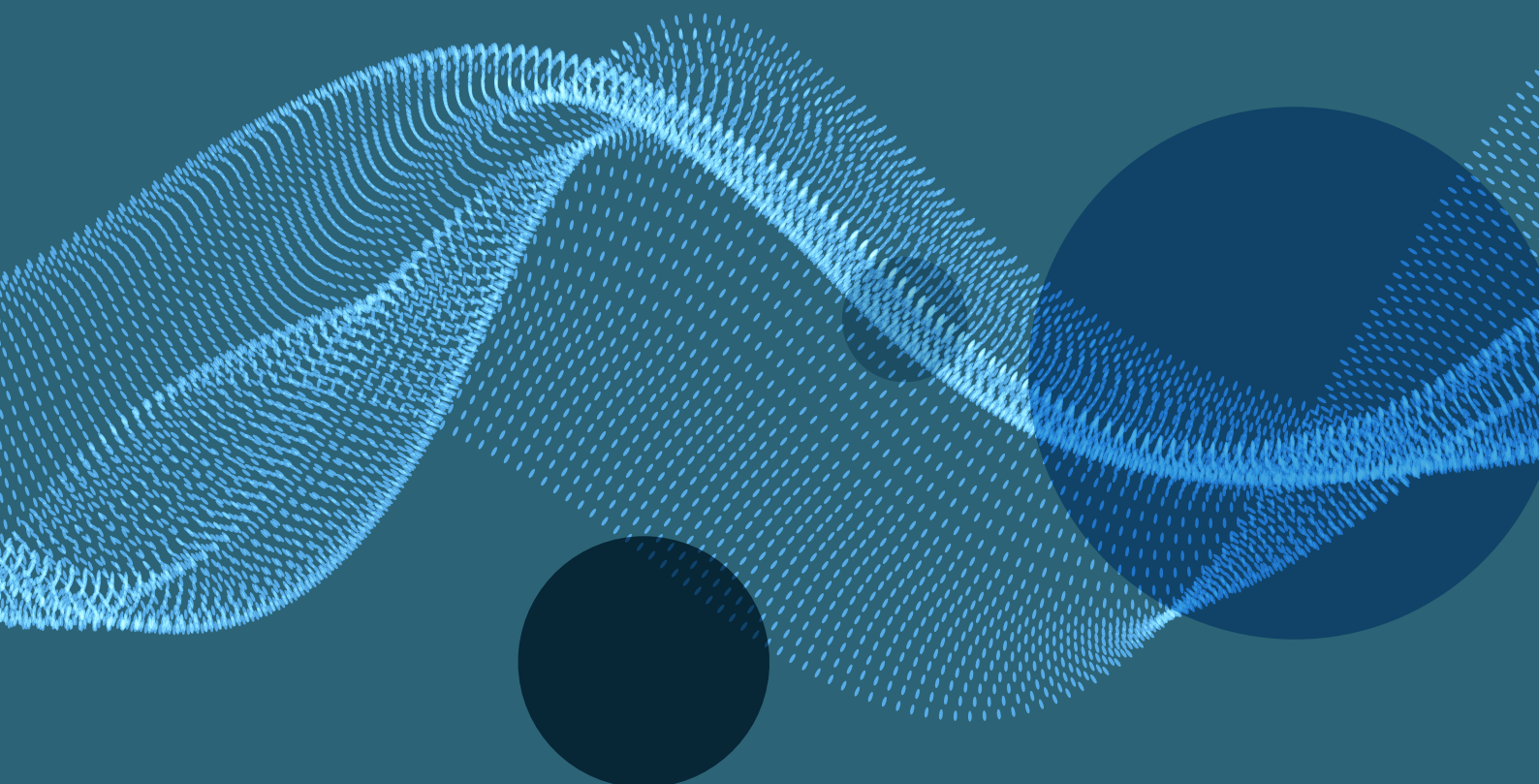
Table 7.3.C Concordance of self-reported treatment status versus presence of detectable antiretrovirals: Total

Percent distribution of HIV-positive adults aged 15 years and older by presence of detectable antiretrovirals (ARVs) versus self-reported HIV treatment status, SHIMS3 2021

Characteristic	ARV status		Total	Number
	Not detectable	Detectable		
Self-reported treatment status				
Not previously diagnosed	79.0	21.0	100.0	206
Previously diagnosed, not on ART	86.7	13.3	100.0	76
Previously diagnosed, on ART	3.9	96.1	100.0	2,596
Total 15-24 years	28.9	71.1	100.0	249
Total 15-49 years	14.4	85.6	100.0	2,154
Total 50+ years	4.8	95.2	100.0	728
Total 15+ years	12.1	87.9	100.0	2,882

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8. VIRAL LOAD SUPPRESSION

8.1 BACKGROUND

Viral load suppression (VLS) is a key indicator of treatment efficacy in people living with HIV. Achieving VLS reduces the damage that HIV can do to the immune system, improves health outcomes, and reduces the risk of HIV transmission.

VLS among all people living with HIV is also an indicator of HIV programmatic success. In the 2016 *Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection*, WHO set a threshold for VLS of less than 1,000 HIV RNA copies/mL.¹ This definition of VLS has been used by UNAIDS, PEPFAR as well as across PHIA to compare progress across countries and subnational areas.^{2,3} It should be noted that, to improve treatment monitoring in people living with HIV, WHO has since lowered the threshold for viral suppression, defining it as <50 copies/mL, while the threshold for treatment failure remains at 1,000 HIV RNA copies/mL or more.⁴

This chapter describes VLS among the population of HIV-positive adults by age, sex, region, and other demographic characteristics.

Recent research suggests other potential programmatic uses for viral load data. This chapter presents estimates, by province, of the proportion of the population with HIV viremia, which may be correlated with HIV incidence.^{5,6} Population viremia is the prevalence of unsuppressed viral load (defined here as $\geq 1,000$ copies/mL) measured without regard to HIV status—the numerator is the number of people with unsuppressed viral loads, and the denominator is the entire population tested. Subnational areas with higher population viremia could be at risk of higher incidence.

SHIMS3 2021 also reports on the proportion of people living with HIV with viral load of less than 200 copies/mL. Although the current definition for VLS serves as a benchmark for monitoring global targets over time, using a lower viral load threshold for clinical monitoring has other potential benefits. Studies have shown that low level viremia (detectable ongoing viral replication at levels below 1,000 copies/mL) is associated with a significant risk of subsequent treatment failure and drug resistance.^{6,7} WHO guidelines recommend enhanced adherence support for those with low level viremia, as well as repeat viral load monitoring at three months.⁴

Finally, SHIMS3 2021 also evaluated access to viral load tests and receipt of results among people living with HIV in Eswatini. In addition to the clinical benefits that viral load monitoring offers, knowing one's own viral load could also help protect a sexual partner from HIV. Several recent studies of couples in which one partner had HIV and the other did not, found that there was no HIV transmission despite sexual activity when viral load was sustained below 200 copies/mL.⁸ In addition, a recent WHO review of the HIV transmission on ART studies found low level viremia was not associated with sexual transmission.⁴ These studies serve as the basis of the U=U (Undetectable = Untransmittable) strategy, which encourages people living with HIV on ART to maintain an undetectable viral load* for their own health and to eliminate the risk of HIV transmission to their sexual partners.⁴

8.2 RESULTS

The following tables and figures present VLS data of people living with HIV in Eswatini, population viremia by region, and other viral load data at the time of the SHIMS3 2021 survey.

* When the U=U strategy was conceived, less than 200 copies/mL was commonly referred to as an undetectable viral load. Now, WHO defines the threshold for undetectable viral load as below 50 copies/mL; but for the purposes of U=U, maintaining a viral load below 200 copies/mL, or even below 1,000 copies/mL, is sufficient to prevent HIV transmission. Having an undetectable viral load remains the goal for clinical care.

Table 8.1 Viral load suppression (HIV RNA < 1,000 copies per milliliter) by demographic characteristics

Among HIV-positive adults aged 15 years and older, percentage with viral load suppression (VLS), by sex, self-reported HIV diagnosis, and antiretroviral therapy (ART) use (adjusted by antiretroviral [ARV] biomarker testing), and selected demographic characteristics, SHIMS3 2021

Characteristic	Men		Women		Total	
	Percentage with VLS ¹	Number	Percentage with VLS ¹	Number	Percentage with VLS ¹	Number
HIV diagnosis and treatment status²						
Unaware of HIV status	11.9	68	10.5	93	11.1	161
Aware of HIV status and not on ART	(0.0)	31	(11.2)	33	5.2	64
Aware of HIV status and on ART	96.7	775	95.9	1,885	96.2	2,660
Residence						
Urban	86.4	180	86.9	391	86.7	571
Rural	86.0	694	91.5	1,620	89.5	2,314
Region						
Hhohho	87.0	206	90.4	480	89.2	686
Lubombo	87.8	189	89.7	424	88.9	613
Manzini	84.3	288	89.4	697	87.7	985
Shiselweni	86.3	191	91.6	410	89.6	601
Marital status						
Never married	78.6	229	86.2	685	84.0	914
Married or living together	89.8	512	91.1	838	90.5	1,350
Divorced or separated	85.7	84	94.0	198	91.1	282
Widowed	(84.5)	43	95.9	276	94.2	319
Education						
No education	87.2	101	96.3	203	92.7	304
Primary	90.1	271	93.5	570	92.2	841
Secondary	84.0	447	87.7	1,103	86.4	1,550
More than secondary	83.9	54	88.9	132	87.3	186
Wealth quintile						
Lowest	87.3	230	91.3	550	89.9	780
Second	87.6	219	92.0	517	90.4	736
Middle	83.6	195	89.8	455	87.6	650
Fourth	83.0	122	87.9	296	86.2	418
Highest	88.8	107	87.8	193	88.2	300
Total 15-24 years	80.5	56	76.1	193	77.1	249
Total 15-49 years	82.4	582	88.6	1,575	86.6	2,157
Total 50+ years	94.3	292	96.3	436	95.3	728
Total 15+ years	86.1	874	90.1	2,011	88.6	2,885

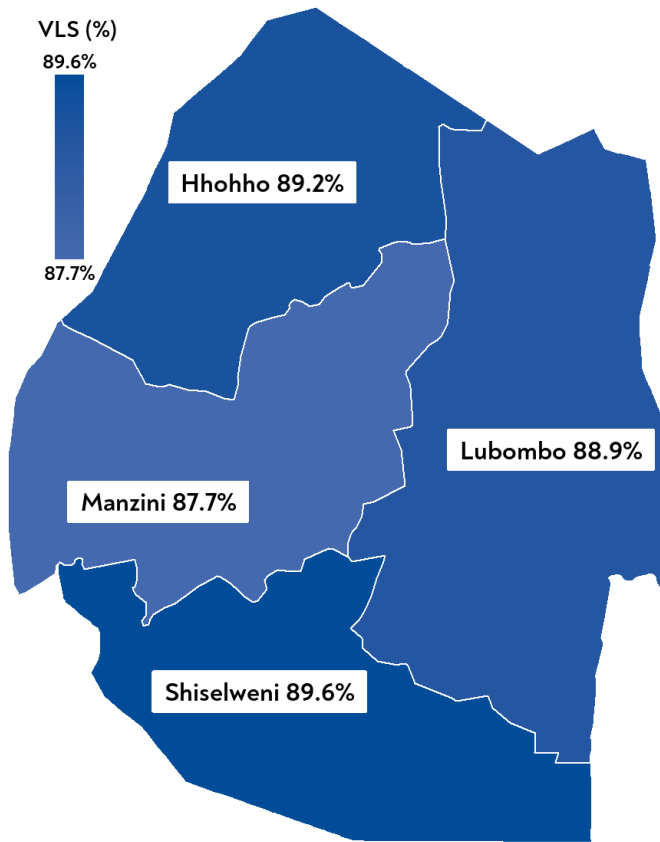
¹ Relates to Global AIDS Monitoring 2021 indicator 1.3: People living with HIV who have suppressed viral loads.

² Both awareness of HIV-positive status and on treatment status were based upon self-report or having a detectable ARV in the blood.

() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Figure 8.1.1
 Viral load suppression among adults living with HIV (ages 15 years and older) by region, SHIMS3 2021



Abbreviation: VLS, viral load suppression.

Figure 8.1.2
 Viral load suppression among adults living with HIV (ages 15 years and older) by region, SHIMS3 2021

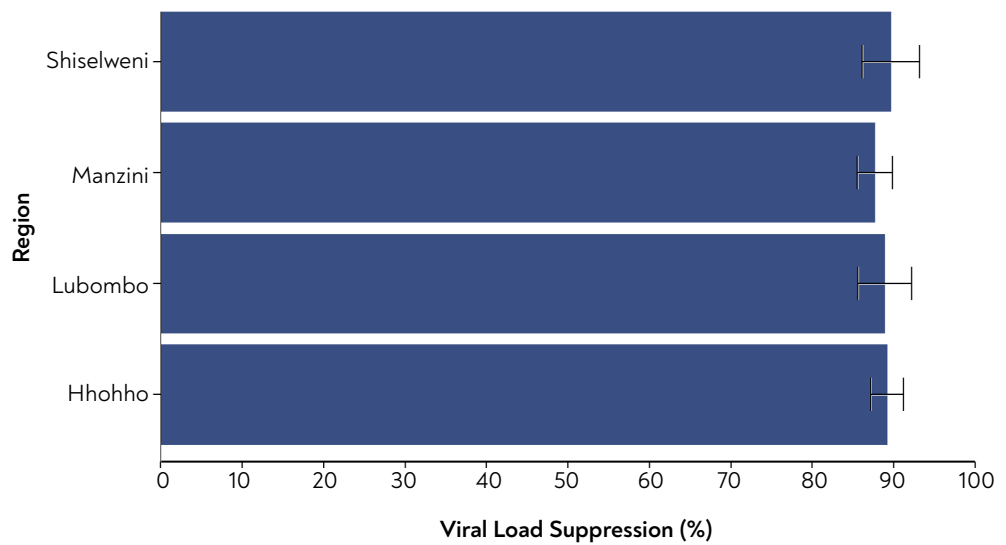


Table 8.2 Viral load suppression (HIV RNA < 1,000 copies per milliliter) by age and sex

Among HIV-positive adults aged 15 years and older, percentage with viral load suppression (VLS) by sex and age, SHIMS3 2021						
Age (years)	Men		Women		Total	
	Percentage with VLS ¹	Number	Percentage with VLS ¹	Number	Percentage with VLS ¹	Number
15-19	(83.9)	28	74.4	54	77.8	82
20-24	(77.4)	28	76.7	139	76.8	167
25-29	(60.2)	33	78.0	251	75.5	284
30-34	63.8	88	91.9	324	83.7	412
35-39	84.5	130	92.0	342	89.5	472
40-44	89.5	137	94.2	278	92.4	415
45-49	92.2	138	96.2	187	94.3	325
50-54	96.8	99	97.5	157	97.2	256
55-59	89.2	65	95.0	127	92.5	192
60-64	93.1	66	92.7	60	92.9	126
65+	95.6	62	97.6	92	96.6	154
15-24	80.5	56	76.1	193	77.1	249
25-34	62.9	121	85.7	575	80.4	696
35-44	87.2	267	93.0	620	91.0	887
45-54	94.2	237	96.8	344	95.5	581
55-64	90.8	131	94.3	187	92.7	318
Total 15-49	82.4	582	88.6	1,575	86.6	2,157
Total 50+	94.3	292	96.3	436	95.3	728
Total 15+	86.1	874	90.1	2,011	88.6	2,885

¹ Relates to Global AIDS Monitoring 2022 indicator 1.3: People living with HIV who have suppressed viral loads.

() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

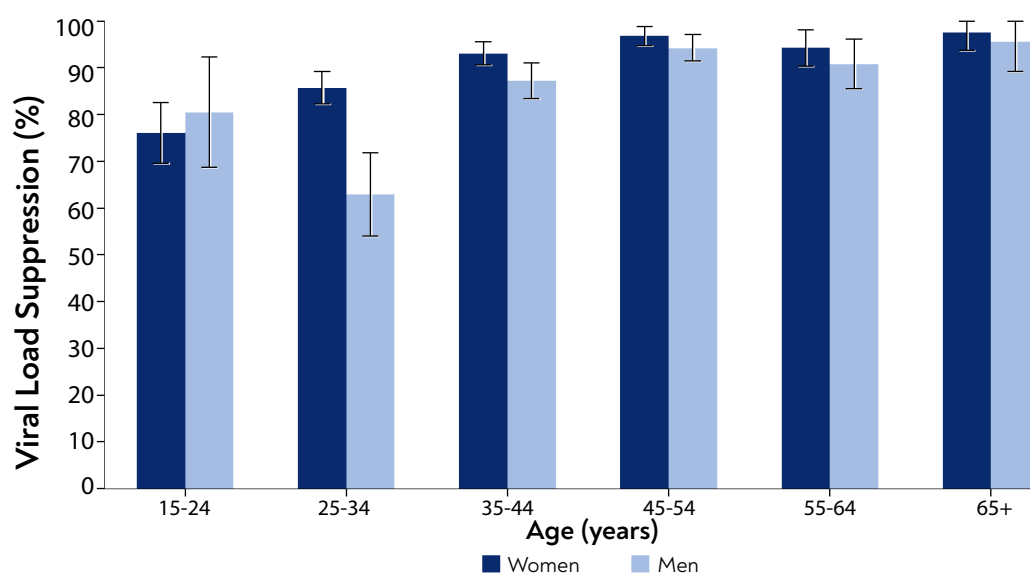


Figure 8.2
Viral load suppression among adults living with HIV by age and sex, SHIMS3 2021

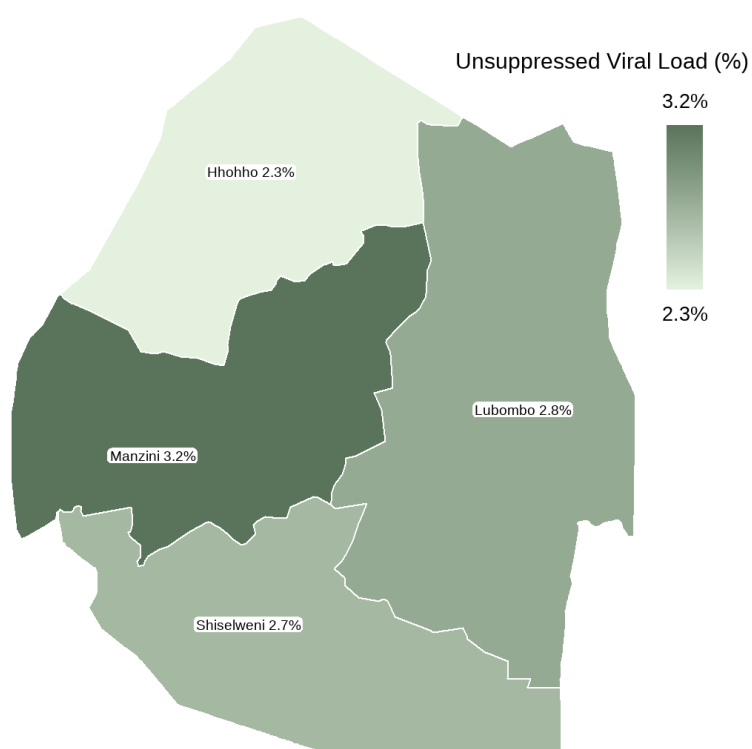
Table 8.3 Population viremia among the adult population in Eswatini, by region

Region	Percentage with VL ≥ 1000 copies/mL ¹	Number of adults tested for HIV	Mean log ₁₀ VL	Number of HIV-positive individuals with VL results
Hhohho	2.3	2,934	1.6	686
Lubombo	2.8	2,382	1.7	613
Manzini	3.2	3,683	1.6	985
Shiselweni	2.7	2,200	1.6	601
Total 15+ years	2.8	11,199	1.6	2,885

¹ Population viremia is defined with a numerator of those with unsuppressed VL ($\geq 1,000$ copies/mL) and denominator of all adults tested (regardless of HIV status).

Figure 8.3

Population viremia (proportion of unsuppressed viral load in the adult population aged 15 years and older) by region, SHIMS3 2021



Note: Population viremia is defined as unsuppressed viral load (HIV RNA $\geq 1,000$ copies per milliliter) among all adults tested in SHIMS3 2021 (regardless of HIV status). The numerator is the number of adults with unsuppressed viral loads, and the denominator is the entire population tested. Subnational areas with higher population viremia could be at risk of higher incidence.

Table 8.4 Viral load < 200 HIV RNA copies per milliliter by demographic and treatment characteristics

Among HIV-positive adults aged 15 years and older, percentage with viral load (VL) < 200 copies per milliliter, by sex, self-reported diagnosis and antiretroviral therapy (ART) use (adjusted by antiretroviral [ARV] biomarker testing), and selected demographic characteristics, SHIMS3 2021

Characteristic	Men		Women		Total	
	Percentage with VL < 200 copies/mL	Number	Percentage with VL < 200 copies/mL	Number	Percentage with VL < 200 copies/mL	Number
HIV diagnosis and treatment status¹						
Unaware of HIV status	7.1	68	5.1	93	6.1	161
Aware of HIV status and not on ART	(0.0)	31	(6.6)	33	3.1	64
Aware of HIV status and on ART	93.1	771	93.1	1,879	93.1	2,650
Number of years since initiating ART						
Less than 12 months	88.6	50	90.5	127	89.9	177
12 months or more	91.9	689	93.2	1,707	92.7	2,396
1 to less than 5 years	89.2	188	91.4	472	90.7	660
5 to less than 10 years	94.2	229	94.6	609	94.5	838
More than 10 years	91.4	262	93.6	603	92.8	865
Residence						
Urban	81.9	179	84.2	389	83.3	568
Rural	82.7	691	88.4	1,616	86.4	2,307
Region						
Hhohho	85.2	205	88.3	479	87.2	684
Lubombo	80.7	188	85.7	423	83.7	611
Manzini	80.6	287	87.1	694	84.9	981
Shiselweni	84.8	190	87.1	409	86.3	599
Marital status						
Never married	76.5	229	83.0	682	81.1	911
Married or living together	85.6	508	88.2	835	87.0	1,343
Divorced or separated	81.1	84	91.3	198	87.8	282
Widowed	(81.0)	43	93.5	276	91.7	319
Education						
No education	84.7	101	94.9	200	90.9	301
Primary	87.6	270	91.4	569	90.0	839
Secondary	80.7	444	84.1	1,101	82.9	1,545
More than secondary	71.1	54	86.0	132	81.2	186
Wealth quintile						
Lowest	84.3	230	87.5	548	86.4	778
Second	85.1	217	89.9	515	88.1	732
Middle	81.0	194	86.5	455	84.5	649
Fourth	78.8	122	85.8	295	83.4	417
Highest	81.6	106	84.6	192	83.4	298
Age (years)						
15-19	(83.9)	28	69.3	54	74.6	82
20-24	(68.7)	28	72.2	139	71.5	167
25-29	(57.9)	33	75.8	249	73.2	282
30-34	61.1	88	89.8	323	81.4	411

Table 8.4 Viral load < 200 HIV RNA copies per milliliter by demographic and treatment characteristics (continued)

Among HIV-positive adults aged 15 years and older, percentage with viral load (VL) < 200 copies per milliliter, by sex, self-reported diagnosis and antiretroviral therapy (ART) use (adjusted by antiretroviral [ARV] biomarker testing), and selected demographic characteristics, SHIMS3 2021

Characteristic	Men		Women		Total	
	Percentage with VL < 200 copies/mL	Number	Percentage with VL < 200 copies/mL	Number	Percentage with VL < 200 copies/mL	Number
35-39	82.3	128	88.6	341	86.5	469
40-44	86.4	136	90.9	278	89.2	414
45-49	88.4	137	93.3	186	91.0	323
50-54	91.7	99	93.9	156	92.9	255
55-59	84.7	65	92.9	127	89.3	192
60-64	92.0	66	91.2	60	91.6	126
65+	88.3	62	95.8	92	92.2	154
Total 15-24	75.9	56	71.4	193	72.5	249
Total 15-49	79.2	578	85.5	1,570	83.5	2,148
Total 50+	89.4	292	93.7	435	91.7	727
Total 15+	82.4	870	87.1	2,005	85.4	2,875

¹ Both awareness of HIV-positive status and on-treatment status were based upon self-report or having a detectable ARV in the blood.

() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Table 8.5 Self-reported viral load testing

Percentage of HIV-positive adults aged 15 years and older who reported they had ever had a viral load (VL) test, and among those who had a VL test, percentage who reported that they received VL results from their last test, by selected demographic characteristics, SHIMS3 2021

Characteristic	Among all HIV-positive adults receiving HIV care		Among adults who had ever had a VL test	
	Percentage who had ever had a VL test	Number	Percentage who received VL results from their last test	Number
Sex				
Male	86.9	717	45.4	626
Female	86.6	1,765	49.6	1,535
Residence				
Urban	86.1	503	52.8	439
Rural	87.0	1,979	46.0	1,722
Region				
Hhohho	87.8	594	50.3	519
Lubombo	90.4	537	52.7	487
Manzini	83.8	845	46.7	711
Shiselweni	87.2	506	42.9	444
Marital status				
Never married	82.9	751	45.9	629
Married or living together	88.5	1,182	49.2	1,044
Divorced or separated	88.1	241	45.8	215
Widowed	89.5	292	51.7	260

Table 8.5 Self-reported viral load testing (continued)

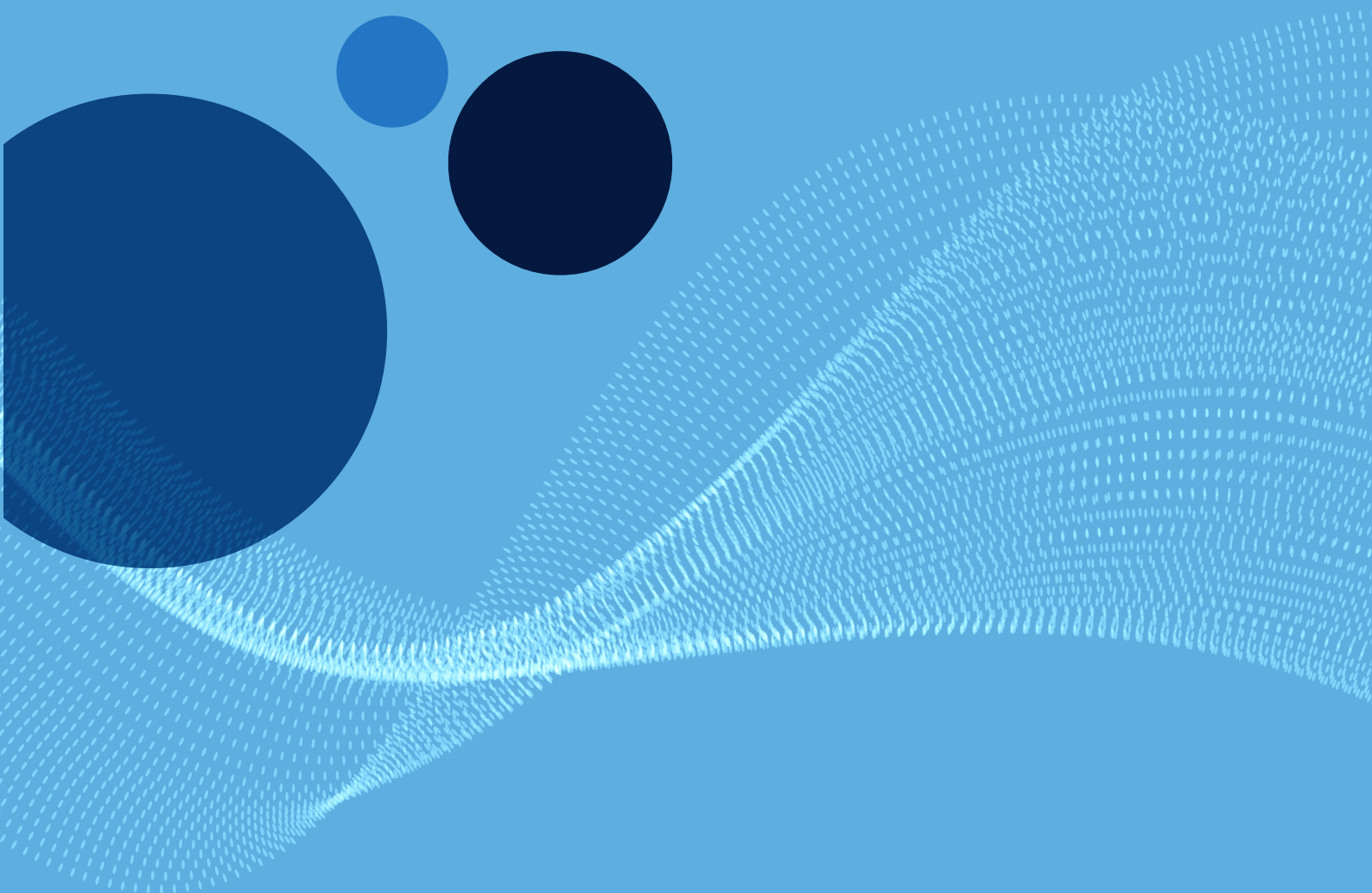
Characteristic	Among all HIV-positive adults receiving HIV care		Among adults who had ever had a VL test	
	Percentage who had ever had a VL test	Number	Percentage who received VL results from their last test	Number
Education				
No education	87.9	262	44.8	229
Primary	85.1	736	45.2	626
Secondary	86.8	1,323	47.9	1,161
More than secondary	90.8	158	64.9	143
Wealth quintile				
Lowest	85.4	670	39.8	576
Second	86.9	639	47.6	556
Middle	87.5	558	48.6	494
Fourth	86.1	349	49.1	299
Highest	87.9	266	60.2	236
Age (years)				
15-19	82.6	58	(38.4)	48
20-24	76.5	128	44.3	99
25-29	86.6	227	45.2	195
30-34	84.9	341	48.2	295
35-39	86.2	411	47.3	356
40-44	89.3	374	46.8	339
45-49	89.1	289	53.3	254
50-54	88.2	240	55.6	211
55-59	85.7	160	47.8	139
60-64	85.9	112	47.9	98
65+	90.2	142	42.3	127
Total 15-24	78.4	186	42.4	147
Total 15-49	86.3	1,828	47.7	1,586
Total 50+	87.8	654	49.7	575
Total 15+	86.7	2,482	48.2	2,161

() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

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9. UNAIDS 95-95-95 TARGETS

9.1 BACKGROUND

To bring the HIV epidemic under control, UNAIDS has set targets that by 2025, 95% of all people living with HIV should know their HIV status; 95% of all persons diagnosed with HIV should receive sustained ART; and 95% of all persons receiving ART should have VLS, defined by UNAIDS as HIV RNA < 1,000 copies/mL.^{1,2}

While Chapter 7 provides results on coverage of HIV testing and treatment services, and Chapter 8 reports VLS among all HIV-positive individuals, irrespective of knowledge of status or ART use, this chapter presents the status of the 95-95-95 which reflects each stage of program performance. Awareness of HIV-positive status among people living with HIV and current ART use among those who are aware of their HIV-positive status are indicators of access to services. VLS among those who know their HIV-positive status and are on treatment not only provides an indication of access to and retention in care, but also provides a measure of program success. The overall 95-95-95 target of VLS among all HIV-positive individuals of 85.7% (the product of 95% of people living with HIV diagnosed, 95% of those diagnosed on treatment, and 95% of those on treatment achieving VLS) or greater is an indication of successful testing and treatment services.¹

SHIMS3 2021 measured the 95-95-95 indicators using self-reported data adjusted with one of two types of biomarker data: either ARV biomarker data or having a viral load result below 200 copies/mL. For instance, in the ARV-adjusted estimates at the national and subnational levels, individuals were defined as ‘aware’ of their HIV-positive status if they reported knowing they were HIV positive before testing as part of SHIMS3 2021 or if they had an ARV detectable in their blood. Individuals were categorized as ‘on treatment’ if they reported ART use or if they had an ARV detectable in their blood. This chapter also presents 95-95-95 estimates at the national level using self-reported data adjusted for having a viral load below 200 copies/mL. Recent research suggests that a viral load measurement below 200 HIV RNA copies/mL may be a useful alternative to ARV-detection for determining awareness and treatment status since it has been believed that individuals are unlikely to have a viral load below 200 copies/mL if they are not on ART.³

The tables in this chapter present the 95-95-95 results in two ways, as conditional, and overall percentages. In both the conditional and the overall cascade, the denominator for the first 95, awareness of HIV-positive status, is all the adults living with HIV in the country. However, in the conditional 95-95-95 cascade (shown in Tables 9.1.B and 9.2.B), the denominator for the second and third 95 indicator is the value of the target preceding it. In other words, the second 95 is the percentage of people on ART among those aware of their HIV-positive status (diagnosed), and the third 95 is the percentage of people with VLS among those on treatment.

In the 95-95-95 overall percentages tables (9.1.A and 9.2.A), the denominator is the same for each 95 indicator: the overall population of adults living with HIV in the country. Thus, while the first 95 is the same as in the conditional table, the second 95 estimate is the percentage of people receiving treatment among the overall population of adults living with HIV in the country, while the third 95 is the percentage of people achieving VLS on ART among all the adults living with HIV in Eswatini.

The figures in this chapter present both conditional percentages (the estimates shown in the insets in the figures) and overall percentages (represented by the bar heights in the figures).

Note that in each 95-95-95 table, individuals with VLS who were not aware of their HIV-positive status or were not on ART, were excluded from the numerator for the third 95 (VLS among those on ART). For this reason, the VLS estimates in the overall 95-95-95 are sometimes slightly lower than VLS estimates reported in the previous chapter, which may include VLS data from individuals with low viral loads who were not receiving treatment, such as individuals who have transiently low viral loads after seroconversion and elite controllers—a small subset of people living with HIV whose immune systems are able to maintain VLS for a period without treatment. Thus, the overall 95-95-95 VLS estimates represent the percentage of the adult population living with HIV known to have been reached by the national HIV program and who are benefiting at each step of the cascade.

9.2 RESULTS

The following tables and figure describe progress towards the 95-95-95 targets overall and by demographic characteristics.

Table 9.1.A Adult 95-95-95 (self-reported and antiretroviral biomarker data); overall percentages

95-95-95 targets among people living with HIV aged 15 years and older based upon their self-reported HIV status and antiretroviral (ART) use, both adjusted for a having a detectable antiretroviral (ARV) in blood, by sex and age, SHIMS3 2021						
Age (years)	Diagnosed					
	Men		Women		Total	
	Percentage aware of HIV status ^{1,2}	Number	Percentage aware of HIV status ^{1,2}	Number	Percentage aware of HIV status ^{1,2}	Number
15-24	91.1	56	83.6	194	85.4	250
25-34	74.8	121	93.1	575	88.8	696
35-49	93.4	406	98.3	807	96.4	1,213
50+	97.0	292	96.8	436	96.9	728
15-49	89.1	583	94.5	1,576	92.7	2,159
15+	91.6	875	94.9	2,012	93.7	2,887
Age (years)	On Treatment					
	Men		Women		Total	
	Percentage on ART ^{1,3}	Number	Percentage on ART ^{1,3}	Number	Percentage on ART ^{1,3}	Number
15-24	87.7	56	80.7	194	82.4	250
25-34	65.0	121	90.0	575	84.1	696
35-49	90.3	406	96.8	807	94.3	1,213
50+	95.3	292	96.6	436	96.0	728
15-49	84.5	583	92.3	1,576	89.7	2,159
15+	87.8	875	93.1	2,012	91.2	2,887
Age (years)	Viral Load Suppression (VLS) on Treatment					
	Men		Women		Total	
	Percentage with VLS ⁴	Number	Percentage with VLS ⁴	Number	Percentage with VLS ⁴	Number
15-24	75.9	56	72.9	194	73.6	250
25-34	62.5	121	85.1	575	79.8	696
35-49	87.5	406	93.4	807	91.1	1,213
50+	93.9	292	95.9	436	94.9	728
15-49	80.9	583	87.7	1,576	85.5	2,159
15+	85.0	875	89.3	2,012	87.7	2,887

¹ Both awareness of HIV-positive status and on treatment status were based upon self-report or having a detectable ARV in the blood.

² Relates to Global AIDS Monitoring Indicator 2021 (GAM 2021) 1.1: People living with HIV who know their HIV status; and PEPFAR indicator DIAGNOSED_NAT: Percentage of adults and children living with HIV who know their status (have been diagnosed).

³ Relates to GAM 2021 1.2: People living with HIV on ART; and PEPFAR indicator TX_CURR_NAT / SUBNAT: Number of adults and children currently receiving ART.

⁴ Relates to GAM 2021 1.3: People living with HIV who have suppressed viral loads; and PEPFAR indicator VL_SUPPRESSION_NAT: Percentage of people living with HIV on ART with a suppressed viral load.

Table 9.1.B Adult 95-95-95 (self-reported and antiretroviral biomarker data); conditional percentages

95-95-95 targets among people living with HIV aged 15 years and older based upon their self-reported HIV status and antiretroviral (ART) use, both adjusted for a having a detectable antiretroviral (ART) in blood, by sex and age, SHIMS3 2021						
Age (years)	Diagnosed					
	Men		Women		Total	
	Percentage aware of HIV status ^{1,2}	Number	Percentage aware of HIV status ^{1,2}	Number	Percentage aware of HIV status ^{1,2}	Number
15-24	91.1	56	83.6	194	85.4	250
25-34	74.8	121	93.1	575	88.8	696
35-49	93.4	406	98.3	807	96.4	1,213
50+	97.0	292	96.8	436	96.9	728
15-49	89.1	583	94.5	1,576	92.7	2,159
15+	91.6	875	94.9	2,012	93.7	2,887
On Treatment Among Those Diagnosed						
Age (years)	Men		Women		Total	
	Percentage on ART ^{1,3}	Number	Percentage on ART ^{1,3}	Number	Percentage on ART ^{1,3}	Number
	15-24	96.4	50	96.4	163	96.4
25-34	86.8	94	96.7	538	94.8	632
35-49	96.6	379	98.6	793	97.8	1,172
50+	98.3	283	99.8	424	99.1	707
15-49	94.8	523	97.7	1,494	96.8	2,017
15+	95.9	806	98.1	1,918	97.3	2,724
Viral Load Suppression (VLS) Among Those on Treatment						
Age (years)	Men		Women		Total	
	Percentage with VLS ⁴	Number	Percentage with VLS ⁴	Number	Percentage with VLS ⁴	Number
	15-24	(86.5)	48	90.4	158	89.4
25-34	96.1	83	94.6	524	94.9	607
35-49	96.9	366	96.4	780	96.6	1,146
50+	98.5	278	99.2	423	98.9	701
15-49	95.8	497	95.1	1,462	95.3	1,959
15+	96.7	775	95.9	1,885	96.2	2,660

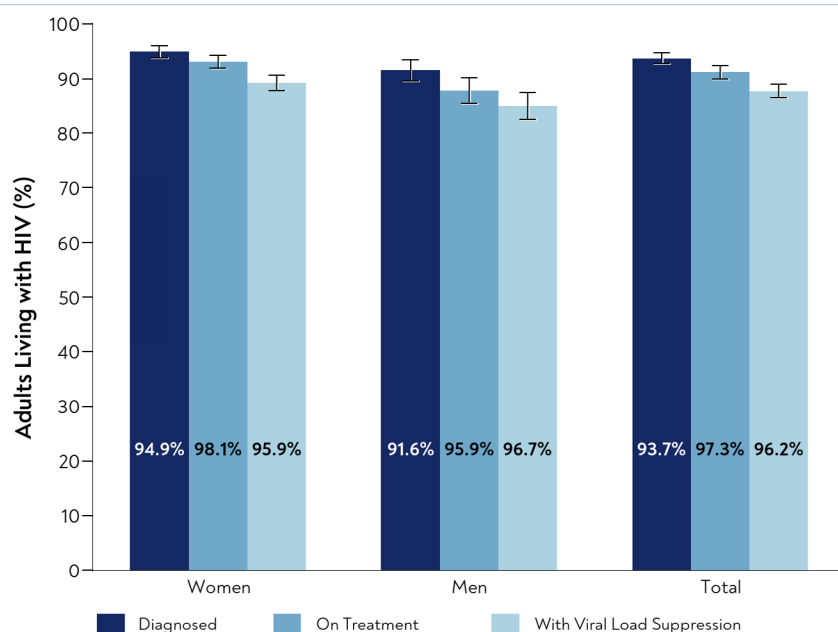
¹ Both awareness of HIV-positive status and on-treatment status were based upon self-report or having a detectable ARV in the blood.

² Relates to Global AIDS Monitoring Indicator 2021 (GAM 2021) 1.1: People living with HIV who know their HIV status; and PEPFAR DIAGNOSED_NAT: Percentage of adults and children living with HIV who know their status (have been diagnosed).

³ Relates to GAM 2021 1.2: People living with HIV on ART; and PEPFAR TX_CURR_NAT / SUBNAT: Number of adults and children currently receiving ART.

⁴ Relates to GAM 2021 1.3: People living with HIV who have suppressed viral loads; and PEPFAR indicator VL_SUPPRESSION_NAT: Percentage of people living with HIV on ART with a suppressed viral load.

() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

**Figure 9.1**

ARV-adjusted 95-95-95 among adults living with HIV (ages 15 years and older) by sex, SHIMS3 2021

Note: In the antiretroviral (ARV)-adjusted 95-95-95, participants are classified as “aware” or “diagnosed” if they reported knowing their HIV-positive status before testing positive in SHIMS3 2021 or had detectable antiretrovirals (ARVs) in their blood. Participants are classified as “on treatment” if they reported that they were on treatment or if they had detectable ARVs in their blood. Inset numbers are conditional proportions; the heights of the bars represent the unconditional proportions among all adults living with HIV.

Table 9.2.A Adult 95-95-95 (self-reported data adjusted for viral load < 200 HIV RNA copies per milliliter); overall percentages

95-95-95 targets among adults living with HIV aged 15 years and older, based upon their self-reported HIV status and antiretroviral therapy (ART) use, both adjusted for having a viral load (VL) < 200 copies per milliliter (mL), by sex and age, SHIMS3 2021

Age (years)	Diagnosed					
	Men		Women		Total	
	Percentage aware of HIV status ^{1,2}	Number	Percentage aware of HIV status ^{1,2}	Number	Percentage aware of HIV status ^{1,2}	Number
15-24	92.5	56	84.4	194	86.4	250
25-34	75.3	121	93.1	575	88.9	696
35-49	93.3	406	98.2	807	96.3	1,213
50+	97.3	292	97.0	436	97.1	728
15-49	89.2	583	94.5	1,576	92.8	2,159
15+	91.7	875	95.0	2,012	93.8	2,887
Age (years)	On Treatment					
	Men		Women		Total	
	Percentage on ART ^{1,3}	Number	Percentage on ART ^{1,3}	Number	Percentage on ART ^{1,3}	Number
15-24	89.2	56	81.8	194	83.6	250
25-34	65.4	121	90.0	575	84.3	696
35-49	90.1	406	96.5	807	94.0	1,213
50+	95.7	292	97.0	436	96.4	728
15-49	84.6	583	92.3	1,576	89.8	2,159
15+	88.0	875	93.2	2,012	91.3	2,887

Table 9.2.A Adult 95-95-95 (self-reported data adjusted for viral load < 200 HIV RNA copies per milliliter); overall percentages (continued)

Age (years)	Viral Load Suppression (VLS) on Treatment					
	Men		Women		Total	
	Percentage with VLS ⁴	Number	Percentage with VLS ⁴	Number	Percentage with VLS ⁴	Number
15-24	77.4	56	74.5	194	75.2	250
25-34	62.9	121	85.4	575	80.2	696
35-49	87.5	406	93.5	807	91.2	1,213
50+	94.3	292	96.3	436	95.3	728
15-49	81.2	583	88.1	1,576	85.8	2,159
15+	85.2	875	89.7	2,012	88.1	2,887

¹ Both awareness of HIV-positive status and on-treatment status were based upon self-report or having a VL < 200 copies/mL.
² Relates to Global AIDS Monitoring indicator 2021 (GAM 2021) 1.1: People living with HIV who know their HIV status and PEPFAR Indicator DIAGNOSED_NAT: The percentage of adults and children living with HIV who know their status (have been diagnosed).
³ Relates to GAM 2021 1.2: People living with HIV on ART and PEPFAR TX_CURR_NAT / SUBNAT: Percentage of adults and children receiving ART.
⁴ Relates to GAM 2021 1.3: People living with HIV who have suppressed viral loads and PEPFAR Indicator VL_SUPPRESSION_NAT: Percentage of people living with HIV on ART with a suppressed viral load.

Table 9.2.B Adult 95-95-95 (self-reported data adjusted for viral load < 200 HIV RNA copies per milliliter); conditional percentages

Age (years)	Diagnosed					
	Men		Women		Total	
	Percentage aware of HIV status ^{1,2}	Number	Percentage aware of HIV status ^{1,2}	Number	Percentage aware of HIV status ^{1,2}	Number
15-24	92.5	56	84.4	194	86.4	250
25-34	75.3	121	93.1	575	88.9	696
35-49	93.3	406	98.2	807	96.3	1,213
50+	97.3	292	97	436	97.1	728
15-49	89.2	583	94.5	1,576	92.8	2,159
15+	91.7	875	95	2,012	93.8	2,887

Age (years)	On Treatment Among Those Diagnosed					
	Men		Women		Total	
	Percentage on ART ^{1,3}	Number	Percentage on ART ^{1,3}	Number	Percentage on ART ^{1,3}	Number
15-24	96.4	51	96.9	165	96.8	216
25-34	86.9	95	96.7	538	94.7	633
35-49	96.6	380	98.3	792	97.7	1,172
50+	98.3	284	100	425	99.2	709
15-49	94.8	526	97.6	1,495	96.7	2,021
15+	95.9	810	98.1	1,920	97.3	2,730

Table 9.2.B Adult 95-95-95 (self-reported data adjusted for viral load < 200 HIV RNA copies per milliliter); conditional percentages (continued)

Age (years)	Viral Load Suppression (VLS) Among Those on Treatment					
	Men		Women		Total	
	Percentage with VLS ⁴	Number	Percentage with VLS ⁴	Number	Percentage with VLS ⁴	Number
15-24	(86.7)	49	91.1	161	90	210
25-34	96.2	84	94.9	524	95.1	608
35-49	97.1	367	96.8	778	96.9	1,145
50+	98.5	279	99.2	425	98.9	704
15-49	96	500	95.5	1,463	95.6	1,963
15+	96.8	779	96.2	1,888	96.5	2,667

¹ Both awareness of HIV-positive status and on-treatment status were based upon self-report or having a VL < 200 copies/mL.

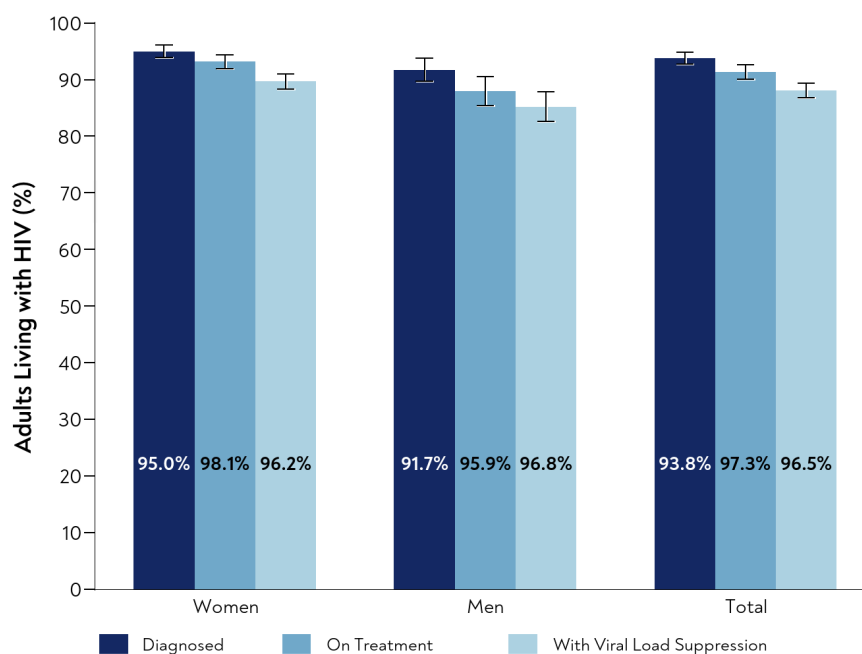
² Relates to Global AIDS Monitoring indicator 2021 (GAM 2021) 1.1: People living with HIV who know their HIV status and PEPFAR Indicator DIAGNOSED_NAT: The percentage of adults and children living with HIV who know their status (have been diagnosed).

³ Relates to GAM 2021 1.2: People living with HIV on ART and PEPFAR TX_CURR_NAT / SUBNAT: Percentage of adults and children receiving ART.

⁴ Relates to GAM 2021 1.3: People living with HIV who have suppressed viral loads and PEPFAR Indicator VL_SUPPRESSION_NAT: Percentage of people living with HIV on ART with a suppressed viral load.

() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

Figure 9.2
Viral load-adjusted 95-95-95 among adults living with HIV (ages 15 years and older) by sex, SHIMS3 2021



Note: In the viral load-adjusted 95-95-95, participants are classified as "aware" or "diagnosed" if they reported knowing their HIV-positive status before testing positive in SHIMS3 2021 or had a viral load < 200 copies/mL. Participants are classified as "on treatment" if they reported that they were on treatment or if they had a viral load < 200 copies/mL. Inset numbers are conditional proportions; the heights of the bars represent the unconditional proportions among all adults living with HIV.

Table 9.3.A Adult 95-95-95 by geography (self-reported and antiretroviral biomarker data); overall percentages

95-95-95 targets among people living with HIV aged 15 years and older based upon their self-reported HIV status and antiretroviral therapy (ART) use, both adjusted for having a detectable antiretroviral (ARV) in blood, by sex, residence, and region, SHIMS3 2021

Characteristic	Diagnosed					
	Men		Women		Total	
	Percentage aware of HIV status ^{1,2}	Number	Percentage aware of HIV status ^{1,2}	Number	Percentage aware of HIV status ^{1,2}	Number
Residence						
Urban	92.8	180	94.1	391	93.6	571
Rural	91.0	695	95.3	1,621	93.7	2,316
Region						
Hhohho	94.6	206	94.7	480	94.7	686
Lubombo	92.6	189	95.0	424	94.0	613
Manzini	89.7	288	95.4	697	93.5	985
Shiselweni	90.4	192	94.0	411	92.7	603
Characteristic	On Treatment					
	Men		Women		Total	
	Percentage on ART ^{1,3}	Number	Percentage on ART ^{1,3}	Number	Percentage on ART ^{1,3}	Number
Residence						
Urban	88.8	180	91.5	391	90.5	571
Rural	87.4	695	93.8	1,621	91.5	2,316
Region						
Hhohho	89.4	206	93.3	480	92.0	686
Lubombo	90.8	189	94.1	424	92.8	613
Manzini	85.4	288	93.1	697	90.5	985
Shiselweni	87.0	192	91.8	411	90.0	603
Characteristic	Viral Load Suppression (VLS) on Treatment					
	Men		Women		Total	
	Percentage with VLS ⁴	Number	Percentage with VLS ⁴	Number	Percentage with VLS ⁴	Number
Residence						
Urban	86.4	180	86.6	391	86.5	571
Rural	84.3	695	90.5	1,621	88.3	2,316
Region						
Hhohho	86.2	206	90.0	480	88.7	686
Lubombo	86.9	189	89.2	424	88.3	613
Manzini	83.5	288	88.6	697	86.8	985
Shiselweni	84.1	192	90.1	411	87.9	603

¹ Both awareness of HIV-positive status and on-treatment status were based upon self-report or having a detectable ARV in the blood.

² Relates to Global AIDS Monitoring indicator 2021 (GAM 2021) 1.1: People living with HIV who know their HIV status; and PEPFAR DIAGNOSED_NAT: Percentage of adults and children living with HIV who know their status (have been diagnosed).

³ Relates to GAM 2021 1.2: People living with HIV on ART and PEPFAR TX_CURR_NAT / SUBNAT: Number of adults and children currently receiving ART.

⁴ Relates to GAM 2021 1.3: People living with HIV who have suppressed viral loads; and PEPFAR VL_SUPPRESSION_NAT: Percentage of people living with HIV on ART with a suppressed viral load.

Table 9.3.B Adult 95-95-95 by geography (self-reported and antiretroviral biomarker data); conditional percentages

95-95-95 targets among people living with HIV aged 15 years and older based upon their self-reported HIV status and antiretroviral (ART) use, both adjusted for a having a detectable antiretroviral (ARV) in blood, by sex, residence, and region, SHIMS3 2021						
Characteristic	Diagnosed					
	Men		Women		Total	
	Percentage aware of HIV status ^{1,2}	Number	Percentage aware of HIV status ^{1,2}	Number	Percentage aware of HIV status ^{1,2}	Number
Residence						
Urban	92.8	180	94.1	391	93.6	571
Rural	91.0	695	95.3	1,621	93.7	2,316
Region						
Hhohho	94.6	206	94.7	480	94.7	686
Lubombo	92.6	189	95.0	424	94.0	613
Manzini	89.7	288	95.4	697	93.5	985
Shiselweni	90.4	192	94.0	411	92.7	603
On Treatment Among Those Diagnosed ¹						
Characteristic	Men		Women		Total	
	Percentage on ART ^{1,3}	Number	Percentage on ART ^{1,3}	Number	Percentage on ART ^{1,3}	Number
	Residence					
Urban	95.8	169	97.2	368	96.7	537
Rural	96.0	637	98.5	1,550	97.6	2,187
Region						
Hhohho	94.5	195	98.5	458	97.1	653
Lubombo	98.2	173	99.1	405	98.7	578
Manzini	95.2	262	97.6	666	96.8	928
Shiselweni	96.3	176	97.6	389	97.1	565
Viral Load Suppression (VLS) Among Those on Treatment						
Characteristic	Men		Women		Total	
	Percentage with VLS ⁴	Number	Percentage with VLS ⁴	Number	Percentage with VLS ⁴	Number
	Residence					
Urban	97.2	162	94.7	357	95.6	519
Rural	96.5	613	96.5	1,528	96.5	2,141
Region						
Hhohho	96.3	185	96.5	452	96.4	637
Lubombo	95.6	170	94.8	400	95.1	570
Manzini	97.8	250	95.1	653	96.0	903
Shiselweni	96.7	170	98.2	380	97.6	550

¹ Both awareness of HIV-positive status and on-treatment status were based upon self-report or having a detectable ARV in the blood.

² Relates to Global AIDS Monitoring indicator 2021 (GAM 2021) 1.1: People living with HIV who know their HIV status; and PEPFAR DIAGNOSED_NAT: Percentage of adults and children living with HIV who know their status (have been diagnosed).

³ Relates to GAM 2021 1.2: People living with HIV on ART and PEPFAR TX_CURR_NAT / SUBNAT: Number of adults and children currently receiving ART.

⁴ Relates to GAM 2021 1.3: People living with HIV who have suppressed viral loads; and PEPFAR VL_SUPPRESSION_NAT: Percentage of people living with HIV on ART with a suppressed viral load.

9.3 REFERENCES

1. Joint United Nations Programme on HIV/AIDS (UNAIDS). *90-90-90: An Ambitious Treatment Target to Help End the AIDS Epidemic*. Geneva: UNAIDS; 2014. https://www.unaids.org/sites/default/files/media_asset/90-90-90_en.pdf. Accessed August 30, 2023.
2. Joint United Nations Programme on HIV/AIDS (UNAIDS). *Prevailing against pandemics by putting people at the centre*. Geneva: UNAIDS; 2020. https://www.unaids.org/sites/default/files/media_asset/prevailing-against-pandemics_en.pdf. Accessed August 11, 2023.
3. Young PW, Zielinski-Gutierrez E, Wamicwe J, et al. Use of viral load to improve survey estimates of known HIV-positive status and antiretroviral treatment coverage. *AIDS*. 2020;34(4):631-636. doi:10.1097/QAD.0000000000002453.

The background features a light blue gradient. On the left, there are three solid circles of varying sizes and shades of blue. On the right, a large, wavy pattern of small, light blue dots creates a textured, fabric-like effect. The text is positioned in the lower right quadrant.

10. CLINICAL PERSPECTIVES ON PEOPLE LIVING WITH HIV

10.1 BACKGROUND

As countries implement treatment for all people living with HIV, ensuring a sustainable health system that is people-centered and innovative requires diligent monitoring and responsiveness.¹ Keeping track of whether those who started on ART remain on treatment can help identify factors associated with disruptions in care and to understand whether there are barriers to retention on ART among certain populations. The data can be used to demonstrate the effectiveness of programs and highlight obstacles to expanding and improving them.

SHIMS3 2021 provided a unique opportunity to gauge progress in the expansion of HIV clinical services in Eswatini, as well as identify gaps and future challenges. Indicators such as CD4 count at diagnosis and retention on ART can provide evidence of program coverage, the ability to reach vulnerable populations, and quality of care. The distribution of CD4 counts also reflects population health and the potential impact of HIV on morbidity and mortality. For instance, a CD4 count below 350/ μ L is categorized as immune suppression, and a CD4 count of less than 200/ μ L is categorized as advanced HIV disease that requires more intensive care, screening for opportunistic infections and cancers, treatment, and support services to manage. When HIV is diagnosed in someone with immune suppression or advanced HIV disease, it is also considered a late diagnosis. Tracking the proportion of diagnoses made late can serve as an indicator of whether there are barriers to testing and can help programs allocate resources for the care of people living with advanced HIV disease.

Mobility with extended stays away from home among people living with HIV may also interfere with continuity of care and lead to treatment disruptions and failure, although this may be mitigated by differentiated approaches to treatment delivery. In addition, this survey gathered data on whether mental health issues affect health-seeking behavior, adherence, retention in care, and other clinical outcomes.²

10.2 RESULTS

The following tables and figure present clinical and mobility characteristics of people living with HIV.

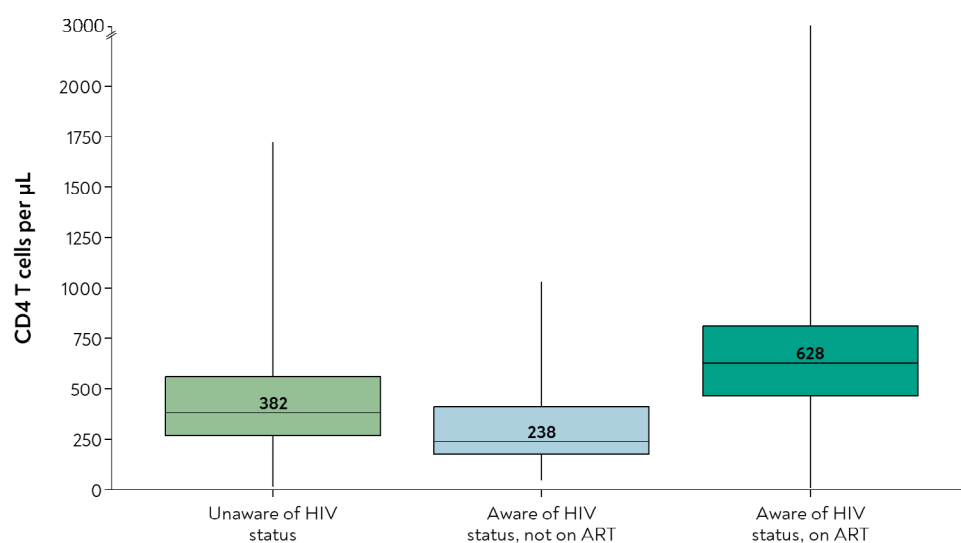
Table 10.1 Median CD4 count by HIV diagnosis and antiretroviral therapy status

Characteristic	Men			Women			Total		
	Median (Q1, Q3)	Range	Number	Median (Q1, Q3)	Range	Number	Median (Q1, Q3)	Range	Number
HIV diagnosis and treatment status¹									
Unaware of HIV status	347 (259, 432)	27-1131	69	419 (292, 642)	17-1725	94	382 (270, 559)	17-1725	163
Aware of HIV status and not on ART	207 (118, 375) [†]	48-734 [†]	31	316 (187, 423) [†]	45-1031 [†]	33	238 (176, 411)	45-1031	64
Aware of HIV status and on ART	523 (398, 689)	48-1642	775	691 (518, 863)	5-2904	1,880	628 (466, 814)	5-2904	2,655
Total 15-24 years	563 (412, 689)	194-1519	56	655 (481, 841)	5-1556	195	629 (466, 813)	5-1556	251
Total 15-49 years	503 (381, 682)	48-1519	585	669 (495, 857)	5-1866	1,577	619 (439, 809)	5-1866	2,162
Total 50+ years	489 (374, 642)	27-1642	293	659 (510, 849)	45-2904	438	576 (425, 763)	27-2904	731
Total 15+ years	501 (378, 661)	27-1642	878	668 (498, 855)	5-2904	2,015	607 (436, 798)	5-2904	2,893

¹ Both awareness of HIV-positive status and on-treatment status were based upon self-report or having a detectable ARV in the blood.

[†] Estimates based on a denominator of 25-49 should be interpreted with caution.

Figure 10.1
CD4 count distribution among adults living with HIV (ages 15 years and older) by HIV diagnosis and ART status, SHIMS3 2021



This box plot shows the CD4 count distribution among those who tested positive in the survey, based on their self-reported awareness of HIV-positive status and antiretroviral therapy (ART) use. The band and number within each box represent the median CD4 count; the box represents the interquartile range (where half of the CD4 count measurements lie); while the whiskers (vertical lines) above and below the box show the range from the minimum to the maximum CD4 count. Maximum counts above 2000 cells/µL are not shown.

Table 10.2 CD4 count distribution

Percent distribution of CD4 count among adults aged 15 years and older who tested HIV positive in the survey but reported an HIV-negative status and had no antiretroviral detectable in blood, by sex and selected demographic characteristics, SHIMS3 2021

Characteristic	CD4 Count				Number
	< 200 cells/µL ¹	200-349 cells/µL	350-499 cells/µL	>= 500 cells/µL	
Sex					
Male	15.2	36.8	29.6	18.4	69
Female	10.2	28.3	20.5	41.0	94
Residence					
Urban	(6.5)	(38.3)	(33.2)	(22.0)	34
Rural	15.5	29.6	21.0	33.9	129
Region					
Hhohho	(16.8)	(32.2)	(25.2)	(25.7)	33
Lubombo	(15.1)	(39.7)	(18.9)	(26.3)	35
Manzini	12.9	32.7	25.2	29.3	57
Shiselweni	(6.2)	(25.2)	(29.5)	(39.1)	38
Age (years)					
15-24	(4.7)	(34.1)	(19.6)	(41.5)	37
25-34	11.6	32.5	26.3	29.6	64
35-44	(12.8)	(35.0)	(27.9)	(24.2)	34
45-54	*	*	*	*	10
55-64	*	*	*	*	15
65+	*	*	*	*	3

Table 10.2 CD4 count distribution (continued)

Characteristic	CD4 Count				Number
	< 200 cells/ μ L ¹	200-349 cells/ μ L	350-499 cells/ μ L	\geq 500 cells/ μ L	
Total 15-24 years	(4.7)	(34.1)	(19.6)	(41.5)	37
Total 15-49 years	10.3	33.1	25.0	31.6	142
Total 50+ years	*	*	*	*	21
Total 15+ years	12.6	32.4	24.9	30.1	163

¹ Relates to Global AIDS Monitoring indicator 2002 1.4: Late HIV Diagnosis.
* Estimates based on a denominator less than 25 have been suppressed.
() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

Table 10.3 Retention on antiretroviral therapy

Characteristic	Men		Women		Total	
	Percentage still taking ART	Number	Percentage still taking ART	Number	Percentage still taking ART	Number
Number of years since initiating ART						
Less than 12 months	100.0	50	97.1	128	98.1	178
12 months or more	98.0	696	99.4	1,719	99.0	2,415
1 to less than 5 years	95.3	191	98.9	479	97.7	670
5 to less than 10 years	99.0	231	99.5	614	99.4	845
10 years or more	99.1	264	99.8	603	99.5	867
Total 15-24 years	(96.0)	45	99.5	154	98.6	199
Total 15-49 years	97.7	489	99.2	1,448	98.7	1,937
Total 50+ years	99.3	276	99.7	421	99.5	697
Total 15+ years	98.2	765	99.3	1,869	98.9	2,634

() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

Table 10.4 HIV care and treatment status by extended stay away from home

Characteristic	Lived away from home for more than one month at a time in the year before the survey			
	Yes	Number	No	Number
HIV diagnosis and treatment status¹				
Unaware of HIV status	10.0	22	5.8	124
Aware of HIV status and not on ART	3.1	7	2.4	50
Aware of HIV status and on ART	86.9	212	91.8	2,196

Table 10.4 HIV care and treatment status by extended stay away from home (continued)

Characteristic	Lived away from home for more than one month at a time in the year before the survey			
	Yes	Number	No	Number
Viral load suppression (VLS)				
Yes	82.1	203	89.5	2,142
No	17.9	38	10.5	226
Treatment interrupted				
Yes	9.3	22	NA	NA
No	88.1	184	NA	NA
Never on ART	2.6	5	NA	NA
Was ART changed				
Yes	58.2	122	60.7	1,318
No	39.2	82	37.3	802
Never on ART	2.6	5	2.1	41
How normally receive ART				
Pick up at local clinic	56.7	120	59.4	1,291
Pick up at hospital	37.6	79	36.0	775
From the community support group/ adherence club	1.1	2	0.8	20
Delivery	1.7	3	2.6	64
A family member or friend collects them	0.0	0	0.1	3
Private pharmacy	1.5	2	NA	1
Not currently on ART	1.4	3	1.1	20
Total 15+ years	100.0	243	100.0	2,379

¹ Both awareness of HIV-positive status and on-treatment status were based upon self-report or having a detectable antiretroviral in the blood.

Table 10.5 Mental health and HIV care and treatment

Characteristic	Screened likely for depressive symptoms ²		Did not screen likely for depressive symptoms		Screened likely for generalized anxiety symptoms ³		Did not screen likely for generalized anxiety symptoms	
	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number
HIV diagnosis and treatment status¹								
Unaware of HIV status	7.8	4	6.3	158	6.0	3	6.4	158
Aware of HIV status and not on antiretroviral therapy (ART)	8.7	4	2.3	57	11.6	6	2.3	56
Aware of HIV status and on ART	83.5	49	91.4	2,580	82.4	44	91.4	2,573
Presence of a detectable antiretroviral (ARV)								
Detectable	82.1	48	88.1	2,486	82.4	44	88.1	2,479
Not detectable	17.9	9	11.9	304	17.6	9	11.9	303

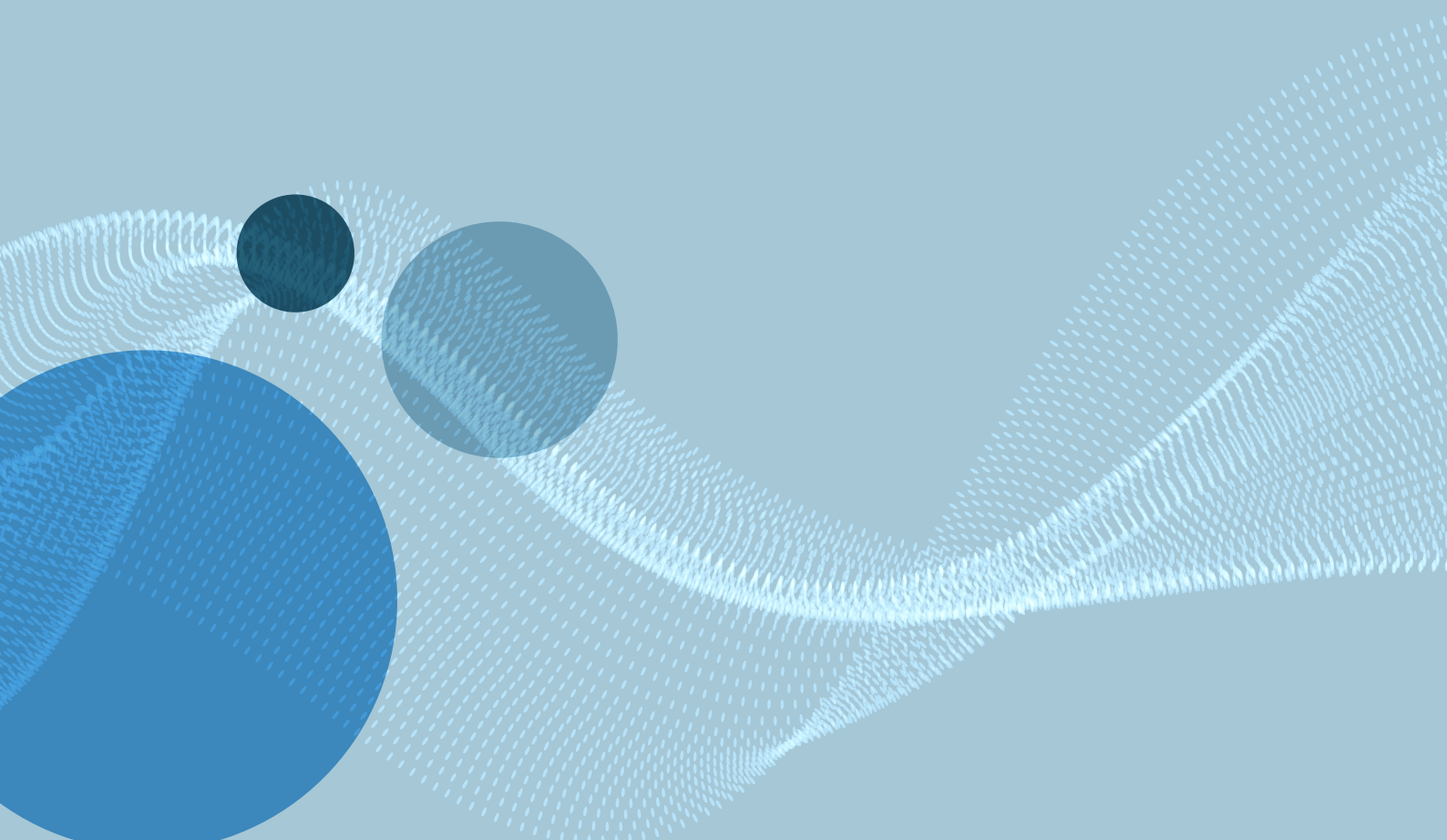
Table 10.5 Mental health and HIV care and treatment (continued)

Percent distribution of care and treatment outcomes among HIV-positive adults by mental health screening symptoms, SHIMS3 202								
Characteristic	Screened likely for depressive symptoms ²		Did not screen likely for depressive symptoms		Screened likely for generalized anxiety symptoms ³		Did not screen likely for generalized anxiety symptoms	
	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number
Viral load suppression (VLS)								
Yes	82.7	48	88.9	2,511	81.3	43	88.8	2,504
No	17.3	9	11.1	282	18.7	10	11.2	281
Ever on ART								
Yes	93.1	51	98.0	2,553	91.6	45	98.0	2,546
No	6.9	3	2.0	47	8.4	4	2.0	47
Retention (among those who reported ever initiating ART)								
Reported current ART use	95.5	49	99.1	2,530	93.5	42	99.1	2,524
Reported initiating but not on ART at time of the survey	4.5	2	0.9	21	6.5	3	0.9	20
Adherence (among those who reported current ART use)								
Adherent	81.4	39	87.5	2,197	85.3	34	87.4	2,190
Non-adherent	18.6	10	12.5	312	14.7	8	12.6	313
Total 15+ years	100.0	58	100.0	2,805	100.0	53	100.0	2,798

¹ Both awareness of HIV-positive status and on treatment status were based upon self-report or having a detectable ARV in the blood.
² Patient Health Questionnaire 2 score over 3 indicating depressive symptoms.
³ Generalized Anxiety Disorder 2-item score over 3 indicating generalized anxiety symptoms.

10.3 REFERENCES

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11. PREVENTION OF MOTHER-TO-CHILD TRANSMISSION

11.1 BACKGROUND

Pregnant women living with HIV who are not on ART are at higher risk of transmitting HIV to their infants during pregnancy, during birth, or through breastfeeding. Over 90% of new HIV infections among infants and young children occur through vertical transmission.¹ Without any interventions, between 15% to 45% of infants may become infected with HIV, with an estimated risk of 5% to 10% during pregnancy, 10% to 20% during labor and delivery, and 5% to 20% through breastfeeding.¹ In 2010, global targets were set to decrease new HIV infections in children and reduce mortality among mothers living with HIV, including a 90% reduction in child HIV infections, a 50% reduction in AIDS-related maternal deaths, and virtual elimination of vertical transmission of HIV.²

To prevent vertical transmission, WHO recommends a comprehensive four-pronged approach including: (1) primary prevention of HIV infection among women of childbearing age (ages 15-49 years, referred to as women below); (2) preventing unintended pregnancies among women living with HIV; (3) preventing HIV transmission from women living with HIV to their infants; and (4) providing appropriate treatment, care, and support to mothers living with HIV and their children and families.²

The broader health goal is to deliver an integrated package of care for the mothers and infants that includes maternal, newborn and child health and prevention of mother-to-child transmission (PMTCT) services. Antenatal care (ANC) is a critical entry platform where most women access PMTCT and it provides the opportunity to monitor pregnancy, provide the interventions needed for PMTCT and overall reduce risk of morbidity for mother and infant. To achieve the elimination of vertical transmission goal, 95% of mothers need to know their status, 95% of HIV-positive women need to be on ART, and 95% need to achieve VLS.³ With such high targets, countries can ill-afford to miss any women in need of these services.

11.2 RESULTS

The following tables present ANC attendance, breastfeeding practices, awareness of a woman's HIV status before or during pregnancy, use of ART during pregnancy in women who were aware of their HIV-positive status during pregnancy, VLS among women, and mother-reported infant HIV testing during the survey.

Table 11.1 Antenatal care

Among women aged 15-49 years who delivered in the three years before the survey, percentage who reported attending at least one antenatal care (ANC) visit for her most recent birth, by selected demographic characteristics, SHIMS3 2021		
Characteristic	Percentage who attended at least one ANC visit	Number
Residence		
Urban	99.0	205
Rural	97.7	1,018
Region		
Hhohho	97.1	315
Lubombo	98.7	314
Manzini	98.5	372
Shiselweni	97.3	222
Marital status		
Never married	97.9	564
Married or living together	98.8	577
Divorced or separated	93.7	68
Widowed	*	5

Table 11.1 Antenatal care (continued)

Among women aged 15-49 years who delivered in the three years before the survey, percentage who reported attending at least one antenatal care (ANC) visit for her most recent birth, by selected demographic characteristics, SHIMS3 2021		
Characteristic	Percentage who attended at least one ANC visit	Number
Education		
No education	(95.2)	43
Primary	97.4	221
Secondary	97.9	790
More than secondary	100.0	169
Wealth quintile		
Lowest	97.9	357
Second	97.8	330
Middle	98.5	221
Fourth	98.2	166
Highest	97.9	149
Age (years)		
15-19	98.3	103
20-24	98.2	308
25-29	98.6	319
30-34	97.6	275
35-39	99.5	160
40-44	92.5	52
45-49	*	6
Total 15-24 years	98.3	411
Total 15-49 years	98.0	1,223

() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.
 * Estimates based on a very small denominator (less than 25) have been suppressed with an asterisk.
 Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Table 11.2 Prevention of mother-to-child transmission: Known HIV status

Characteristic	Tested for HIV during ANC and received results		Percentage who already knew they were HIV positive	Total percentage with known HIV status ¹	Number of women who gave birth within the 12 months before the survey
	Percentage who tested HIV positive	Percentage who tested HIV negative			
Residence					
Urban	2.4	67.7	27.2	97.4	88
Rural	2.6	67.3	23.4	93.3	442
Region					
Hhohho	3.5	68.0	25.0	96.4	145
Lubombo	4.3	63.8	26.9	94.9	138
Manzini	0.8	73.9	20.1	94.8	154
Shiselweni	1.9	59.0	28.3	89.1	93

Table 11.2 Prevention of mother-to-child transmission: Known HIV status (continued)

Among women aged 15-49 years who gave birth within the [12 months before the survey or country specific cutoff up to 3 years], percentage who reported that they were tested for HIV during antenatal care (ANC) and received their results or that they already knew they were HIV positive during their last pregnancy, by selected demographic characteristics, SHIMS3 2021

Characteristic	Tested for HIV during ANC and received results		Percentage who already knew they were HIV positive	Total percentage with known HIV status ¹	Number of women who gave birth within the 12 months before the survey
	Percentage who tested HIV positive	Percentage who tested HIV negative			
Marital status					
Never married	2.4	71.9	20.5	94.8	258
Married or living together	2.7	65.6	26.2	94.5	236
Divorced or separated	(3.0)	(35.7)	(48.6)	(87.3)	30
Widowed	*	*	*	*	3
Education					
No education	*	*	*	*	20
Primary	5.5	56.2	33.6	95.2	95
Secondary	2.1	68.5	23.2	93.9	346
More than secondary	0.0	78.3	17.0	95.3	69
Wealth quintile					
Lowest	3.2	62.7	27.4	93.3	167
Second	2.5	68.7	22.2	93.3	152
Middle	3.2	65.7	28.2	97.2	89
Fourth	0.0	71.8	23.6	95.4	66
Highest	3.1	72.4	18.7	94.1	56
Age (years)					
15-19	0.0	90.4	2.8	93.2	67
20-24	2.9	77.4	17.0	97.4	136
25-29	3.6	66.2	26.5	96.3	128
30-34	2.9	50.4	39.2	92.4	120
35-39	3.0	48.5	36.4	87.8	59
40-44	*	*	*	*	18
45-49	*	*	*	*	2
Total 15-24	2.0	81.7	12.3	96.0	203
Total 15-49	2.5	67.4	24.4	94.3	530

¹ Relates to PEPFAR indicator PMTCT_STAT_NAT / SUBNAT: Percentage of pregnant women with known HIV status and Global AIDS Monitoring indicator 2020 2.6: HIV testing in pregnant women.

() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

* Estimates based on a denominator less than 25 have been suppressed.

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Table 11.3 Prevention of mother-to-child transmission: HIV-positive pregnant women who received antiretroviral therapy

Among self-reported HIV-positive women aged 15-49 years who gave birth within the [12 months before the survey or country specific cutoff up to 3 years], percentage who reported they had received antiretroviral therapy (ART) during their last pregnancy to reduce the risk of mother-to-child-transmission, by selected demographic characteristics, SHIMS3 2021

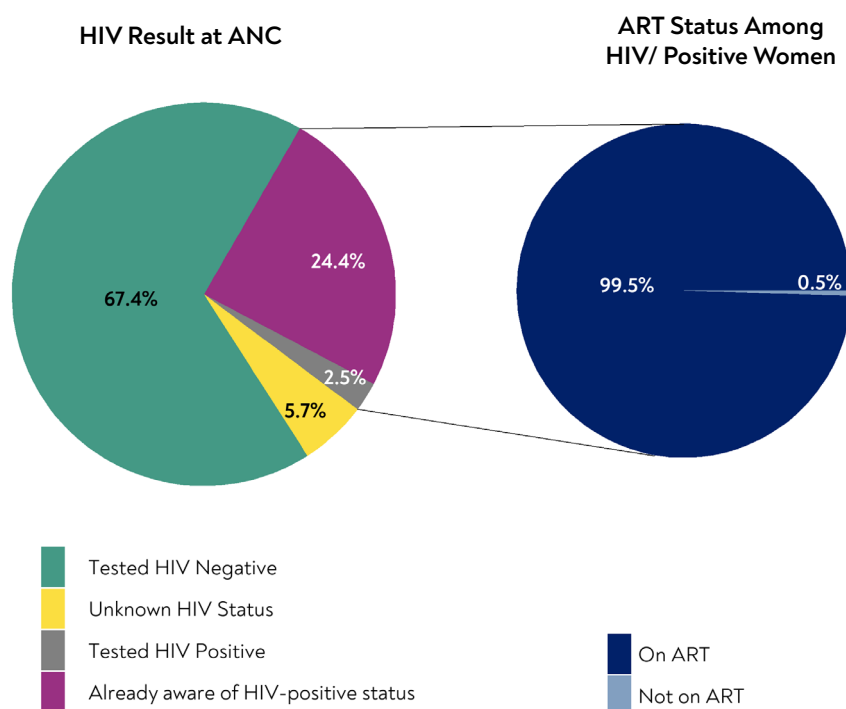
Characteristic	Percentage who were already on ART prior to pregnancy	Percentage who were newly initiated on ART during pregnancy or labor and delivery	Total percentage who received ART ¹	Number of HIV-positive women who gave birth within the 12 months before the survey
Residence				
Urban	(91.8)	(8.2)	(100.0)	28
Rural	80.2	19.1	99.3	119
Region				
Hhohho	(81.6)	(18.4)	(100.0)	43
Lubombo	(80.2)	(18.1)	(98.3)	43
Manzini	(86.0)	(14.0)	(100.0)	31
Shiselweni	(87.4)	(12.6)	(100.0)	30
Marital status				
Never married	79.0	21.0	100.0	62
Married or living together	84.9	14.0	98.9	68
Divorced or separated	*	*	*	16
Widowed	*	*	*	1
Education				
No education	*	*	*	9
Primary	(86.0)	(14.0)	(100.0)	37
Secondary	81.1	18.9	100.0	89
More than secondary	*	*	*	12
Wealth quintile				
Lowest	78.3	21.7	100.0	53
Second	(87.7)	(10.4)	(98.1)	38
Middle	(80.5)	(19.5)	(100.0)	28
Fourth	*	*	*	15
Highest	*	*	*	13
Age (years)				
15-19	*	*	*	2
20-24	(75.9)	(24.1)	(100.0)	26
25-29	(76.8)	(23.2)	(100.0)	40
30-34	90.1	9.9	100.0	50
35-39	*	*	*	23
40-44	*	*	*	5
45-49	*	*	*	1
Total 15-24	(74.1)	(25.9)	(100.0)	28
Total 15-49	83.4	16.1	99.5	147

¹ Relates to Global AIDS Monitoring indicator 2021 2.3: Preventing mother-to-child transmission of HIV; and PEPFAR indicator PMTCT_ARV_NAT / SUBNAT: Number and percentage of HIV-positive pregnant women who received antiretroviral medicine during pregnancy to reduce the risk of mother-to-child transmission.

() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

* Estimates based on a denominator less than 25 have been suppressed.

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

**Figure 11.3**

Self-reported HIV testing status and antiretroviral therapy use during antenatal care among mothers aged 15-49 years who delivered in the 12 months before the survey, SHIMS3 2021

Abbreviations: ANC, antenatal care; ART, antiretroviral therapy.

Table 11.4 Breastfeeding status by child's age and mother's HIV status

Percent distribution of last-born children born to women aged 15-49 years in the three years before the survey by breastfeeding status reported by their mothers, by child's age and mother's HIV status, SHIMS3 2021

Characteristic	Never breastfed	Ever breastfed, but not currently breastfeeding	Currently breastfeeding	Total	Number
Child's age (months)					
0-1	8.3	5.4	86.3	100.0	99
2-3	3.2	5.7	91.1	100.0	99
4-5	7.7	12.9	79.4	100.0	82
6-8	5.0	15.8	79.2	100.0	133
9-11	8.6	23.4	68.0	100.0	116
12-17	9.2	38.5	52.3	100.0	197
18-23	8.3	78.9	12.7	100.0	183
24-36	8.0	86.9	5.1	100.0	312
Result of mother's SHIMS3 survey HIV					
HIV positive	13.5	49.3	37.2	100.0	380
HIV negative	4.8	45.3	49.9	100.0	776
Not tested	7.2	48.0	44.8	100.0	67
Total	7.6	46.7	45.7	100.0	1,223

Table 11.5 Prevention of mother-to-child transmission: Early infant testing

Among self-reported HIV-positive women aged 15-49 years who delivered within the 3 years before the survey, percentage who reported their last-born infant had an HIV test done within 2 months of birth and within 12 months of birth, by result of infant's first HIV test, SHIMS3 2021

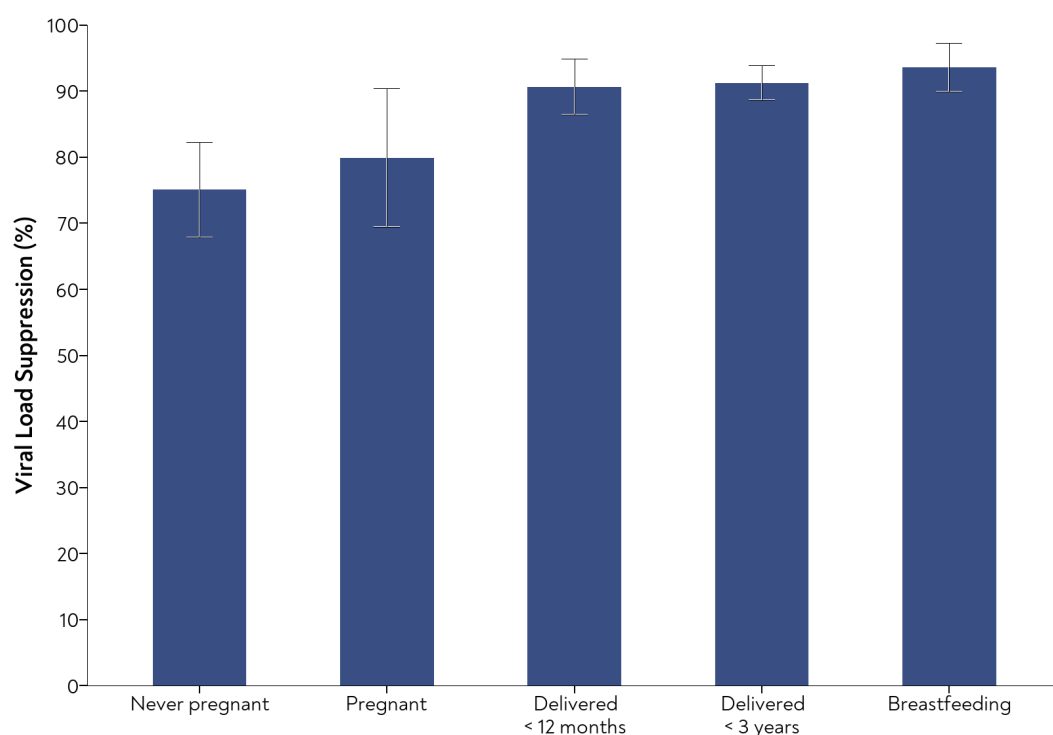
Characteristic	Percentage of infants who had an HIV test within 2 months of age ^{1,2}	Percentage of infants who had an HIV test between 2 and 12 months of age ²	Number of infants born in the 3 years before the survey to HIV-positive women ³
Result of infant's HIV test			
HIV positive	*	*	5
HIV negative	62.4	26.4	271
Don't know/other	*	*	19
Total	61.4	24.9	307

¹ Relates to Global AIDS Monitoring indicator 2021 2.1: Early infant diagnosis.
² Relates to PEPFAR indicator PMTCT_EID: Percentage of infants born to HIV-positive women who received a first virologic HIV test (sample collected) by 12 months of age.
³ Includes only last-born infants.
 * Estimates based on a denominator less than 25 have been suppressed.

Table 11.6 Viral load suppression in HIV-positive women of childbearing age (ages 15-49), by pregnancy status and other characteristics

Among HIV-positive women aged 15-49 years, percentage with viral load suppression (VLS) (HIV RNA < 1,000 copies/milliliter), by self-reported pregnancy, breastfeeding, and timing since pregnancy, SHIMS3 2021

Characteristic	Percentage with VLS	Number
Ever pregnant		
Yes	90.2	1,413
No	75.1	158
Pregnancy status		
Pregnant at time of the survey	79.9	74
Not pregnant at time of the survey	89.2	1,474
Delivered in the 12 months before the survey		
Delivered in the 12 months before the survey	90.7	169
Did not deliver in the 12 months before the survey	90.4	1,224
Delivered in the 3 years before the survey		
Delivered in the 3 years before the survey	91.2	376
Did not deliver in the 3 years before the survey	90.2	1,016
Breastfeeding status		
Never breastfed	90.0	63
Ever breastfed, but not currently breastfeeding	87.4	242
Currently breastfeeding	93.6	145

**Figure 11.6**

Viral load suppression among women living with HIV (ages 15-49 years) by pregnancy status, time since last pregnancy, and breastfeeding status at time of survey, SHIMS3 2021

11.3 REFERENCES

1. De Cock KM, Fowler MG, Mercier E, et al. Prevention of mother-to-child HIV transmission in resource-poor countries: translating research into policy and practice. *JAMA*. 2000;283(9):1175-1182. doi:10.1001/jama.283.9.1175.
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3. World Health Organization. *Global guidance on criteria and processes for validation: elimination of mother-to-child transmission of HIV and syphilis, 2nd edition*. Geneva: World Health Organization; 2017. <https://www.who.int/publications/item/9789240039360>. Accessed August 30, 2023.

An abstract graphic design featuring a dark teal background. In the upper right, there are three overlapping circles of varying sizes, with the largest one being a deep navy blue. A large, wavy, dotted pattern in a lighter blue shade flows across the middle of the page, creating a sense of movement and depth. The overall aesthetic is modern and clean.

12. HIV RISK FACTORS AND PREVENTION INTERVENTIONS

12.1 BACKGROUND

This chapter describes the prevalence of sexual behaviors that increase the risk of HIV infection as well as the uptake of key HIV prevention methods. SHIMS3 2021 provides evidence on high-risk behaviors, including early sexual debut, number of lifetime sexual partners, and recent engagement in multiple sexual partnerships among adults in Eswatini. The report also presents data on use of proven HIV prevention interventions including condom use, male circumcision, and PrEP (pre-exposure prophylaxis—the use of ARVs to prevent HIV acquisition).

Risk-taking behavior among young adolescents (ages 10-14 years) and young people (ages 15-24 years) is a particularly important challenge for long-term epidemic control. Young people are particularly more likely to engage in risky sexual behaviors than older adults and have less frequent contact with the healthcare system.¹ Although young adolescents were not included in SHIMS3 2021, Table 12.3 shows the prevalence of early sexual debut before 15 years of age self-reported by young people in Eswatini, by sex, region, and other selected sociodemographic characteristics that may identify where young adolescents and young people may benefit from enhanced HIV education and prevention efforts.

Although the scale-up of universal testing and treatment has been expected to lead to reduced HIV transmission, eliminating HIV transmission will require a combination of prevention options that can meet the current needs of different people.² Condoms remain an inexpensive and effective tool that can prevent HIV, sexually transmitted infections, and may help reduce the frequency of unwanted pregnancies (particularly in combination with other contraception methods). SHIMS3 2021 asked participants about their condom use at last sexual intercourse, particularly with nonmarital, noncohabitating partners (Tables 12.4.A, 12.4.B, 12.4.C). Since 2007, WHO and UNAIDS have also recommended voluntary medical male circumcision as a cost-effective strategy to reduce male acquisition of HIV.³ To inform the national voluntary medical male circumcision program, SHIMS3 2021 asked men whether they had been medically or traditionally circumcised (Table 12.5). Finally, PrEP, the use of ARVs by people at risk for HIV to prevent HIV acquisition, has become an important prevention tool among some populations and in regions with the highest HIV prevalence.⁴ Tables 12.6, 12.7, and 12.8 describe the knowledge levels, acceptability of, and uptake of PrEP among adults in Eswatini at the time of the survey.

With this information, the national program can tailor its prevention efforts to reach those individuals most at risk for HIV infection and most in need of services and provide them with prevention options that work for them.

12.2 RESULTS

The following tables present SHIMS3 2021 data on HIV risk factors and uptake of prevention interventions by demographic characteristics.

Table 12.1 Sexual behavior by demographic characteristics

Percent distribution of self-reported sexual behavior characteristics among adults aged 15 years and older by sex, SHIMS3 2021						
Characteristic	Men		Women		Total	
	Percent	Number	Percent	Number	Percent	Number
Ever had sex						
Yes	84.1	4,076	88.7	6,211	86.5	10,287
No	15.9	822	11.3	726	13.5	1,548
Had sex in the 12 months before the survey						
Yes	72.7	3,400	66.6	4,370	69.5	7,770
No	10.9	546	21.5	1,487	16.5	2,033
Never had sex	16.3	822	11.9	726	14.0	1,548

Table 12.1 Sexual behavior by demographic characteristics (continued)

Characteristic	Men		Women		Total	
	Percent	Number	Percent	Number	Percent	Number
Percent distribution of self-reported sexual behavior characteristics among adults aged 15 years and older by sex, SHIMS3 2021						
Had sexual intercourse before the age of 15						
Yes	3.5	162	3.2	202	3.3	364
No	79.6	3,629	84.7	5,533	82.3	9,162
Never had sex	16.9	822	12.1	726	14.4	1,548
Total 15-24 years	34.0	1,781	30.2	1,940	32.0	3,721
Total 15-49 years	82.4	4,112	77.5	5,261	79.8	9,373
Total 50+ years	17.6	946	22.5	1,724	20.2	2,670
Total 15+ years	100.0	5,058	100.0	6,985	100.0	12,043

Table 12.2 HIV prevalence by sexual behavior

Characteristic	Men		Women		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
Prevalence of HIV among adults aged 15 years and older by sex and self-reported sexual behavior characteristics, SHIMS3 2021						
Age (years) at first sexual intercourse						
Under 15	16.9	144	44.9	199	31.6	343
15-19	18.3	1,851	35.4	3,587	28.5	5,438
20-24	24.9	1,000	29.0	1,303	26.9	2,303
25+	25.0	463	28.2	288	26.0	751
Number of lifetime sexual partners						
0	3.6	786	6.3	684	4.8	1,470
1	11.1	567	19.0	1,823	16.7	2,390
2+	22.4	2,790	39.9	3,472	30.9	6,262
Number of sexual partners in the 12 months before the survey						
0	23.0	513	31.3	1,400	28.7	1,913
1	22.5	2,245	34.8	3,716	29.3	5,961
2+	17.2	832	36.1	309	21.6	1,141
Condom use at last sexual intercourse in the 12 months before the survey						
Used condom	24.9	1,635	43.8	1,926	34.0	3,561
Did not use condom	16.8	1,429	26.4	2,062	21.8	3,491
No sexual intercourse in the 12 months before the survey	23.0	513	31.3	1,400	28.7	1,913
Total 15-24 years	3.4	1,692	11.0	1,832	7.2	3,524
Total 15-49 years	15.6	3,771	31.6	4,915	23.7	8,686
Total 50+ years	33.1	883	26.1	1,630	29.0	2,513
Total 15+ years	18.7	4,654	30.4	6,545	24.8	11,199

Table 12.3 Sex before the age of 15 years

Characteristic	Men		Women		Total	
	Percentage who had sex before the age of 15 years	Number	Percentage who had sex before the age of 15 years	Number	Percentage who had sex before the age of 15 years	Number
Residence						
Urban	5.9	263	2.7	330	4.2	593
Rural	3.8	1,425	1.8	1,525	2.8	2,950
Region						
Hhohho	1.7	437	1.6	428	1.7	865
Lubombo	1.8	337	0.9	434	1.3	771
Manzini	7.2	531	3.0	602	5.0	1,133
Shiselweni	4.9	383	1.9	391	3.5	774
Marital status						
Never married	4.2	1,640	1.8	1,650	3.1	3,290
Married or living together	*	23	3.6	160	3.0	183
Divorced or separated	*	17	(4.3)	34	9.7	51
Widowed	*	0	*	0	*	0
Education						
No education	*	10	*	12	*	22
Primary	6.1	350	3.0	235	4.9	585
Secondary	4.1	1,226	2.1	1,468	3.0	2,694
More than secondary	1.5	102	0.0	140	0.7	242
Wealth quintile						
Lowest	3.2	387	2.6	451	2.9	838
Second	4.6	481	1.5	524	3.1	1,005
Middle	5.1	387	2.3	362	3.8	749
Fourth	4.5	229	1.8	288	3.1	517
Highest	3.9	204	1.8	230	2.8	434
Age (years)						
15-19	3.7	936	2.3	967	3.0	1,903
20-24	4.9	752	1.7	888	3.3	1,640
Total 15-24	4.3	1,688	2.0	1,855	3.2	3,543

() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

* Estimates based on a denominator less than 25 have been suppressed.

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Table 12.4.A Condom use at last sex with a nonmarital, noncohabitating partner: Men

Among men aged 15 years and older, self-reported condom use with nonmarital, noncohabitating partners in the 12 months before the survey by selected demographic characteristics, SHIMS3 2021

Characteristic	Among men who reported having sex in the 12 months before the survey		Among men who reported having sex with a nonmarital, noncohabitating partner	
	Percentage who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey ¹	Number	Percentage who reported using a condom the last time they had sex with a such a partner ²	Number
Residence				
Urban	57.6	765	64.9	444
Rural	57.8	2,614	66.6	1,486
Region				
Hhohho	56.6	884	71.0	503
Lubombo	57.5	633	64.4	356
Manzini	58.7	1,194	64.8	693
Shiselweni	57.7	668	63.7	378
Marital status				
Never married	92.7	1,620	68.1	1,496
Married or living together	15.7	1,520	59.6	216
Divorced or separated	94.5	189	55.4	176
Widowed	(80.4)	34	76.1	27
Education				
No education	25.3	180	63.9	45
Primary	46.8	755	63.4	342
Secondary	64.3	1,941	67.1	1,252
More than secondary	58.1	502	65.0	290
Wealth quintile				
Lowest	55.7	725	65.8	391
Second	60.4	830	68.5	484
Middle	65.0	747	65.6	479
Fourth	52.4	536	67.4	285
Highest	53.5	541	62.5	291
Age (years)				
15-19	98.1	237	76.1	231
20-24	96.2	567	73.0	542
25-29	80.2	505	63.2	409
30-34	64.7	426	60.1	272
35-39	47.5	430	54.8	205
40-44	36.6	328	55.9	115
45-49	25.2	236	74.5	58
50-54	17.9	181	62.6	29
55-59	20.8	149	74.9	28
60-64	15.3	148	*	24
65+	10.2	172	*	17

Table 12.4.A Condom use at last sex with a nonmarital, noncohabitating partner: Men (continued)

Characteristic	Among men who reported having sex in the 12 months before the survey		Among men who reported having sex with a nonmarital, noncohabitating partner	
	Percentage who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey ¹	Number	Percentage who reported using a condom the last time they had sex with a such a partner ²	Number
Total 15-24	96.7	804	73.9	773
Total 15-49	66.9	2,729	66.0	1,832
Total 50+	16.1	650	67.8	98
Total 15+	57.8	3,379	66.1	1,930

¹ For individuals with more than three partners, having sex with a nonmarital noncohabitating partner is determined using information about the last three partners.
² Relates to Global AIDS Monitoring indicator 2021 3.18: Condom use at last high-risk sex.
 () Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.
 * Estimates based on a denominator less than 25 have been suppressed.
 Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Table 12.4.B Condom use at last sex with a nonmarital, noncohabitating partner: Women

Characteristic	Among women who reported having sex in the 12 months before the survey		Among women who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey	
	Percentage who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey ¹	Number	Percentage who reported using a condom the last time they had sex with such a partner ²	Number
Residence				
Urban	61.6	949	57.5	570
Rural	47.9	3,348	59.7	1,502
Region				
Hhohho	47.9	1,052	61.4	475
Lubombo	51.5	853	59.2	412
Manzini	57.4	1,525	59.1	800
Shiselweni	48.4	867	54.4	385
Marital status				
Never married	91.2	1,806	60.6	1,624
Married or living together	5.8	2,102	60.0	95
Divorced or separated	96.7	254	50.8	242
Widowed	82.0	113	53.8	91
Education				
No education	31.2	217	63.2	60
Primary	39.9	881	54.0	312
Secondary	58.4	2,545	59.5	1,386
More than secondary	51.9	651	59.6	314

Table 12.4.B Condom use at last sex with a nonmarital, noncohabitating partner: Women (continued)

Characteristic	Among women who reported having sex in the 12 months before the survey		Among women who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey	
	Percentage who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey ¹	Number	Percentage who reported using a condom the last time they had sex with such a partner ²	Number
Wealth quintile				
Lowest	50.5	980	59.1	465
Second	52.9	1,034	58.2	497
Middle	53.8	880	59.5	423
Fourth	53.9	744	59.1	371
Highest	51.4	659	58.3	316
Age (years)				
15-19	92.6	322	65.4	297
20-24	80.5	709	58.9	557
25-29	60.1	773	54.5	445
30-34	46.9	701	58.6	298
35-39	38.2	588	54.5	197
40-44	36.4	387	60.9	123
45-49	28.1	304	73.4	77
50-54	23.1	204	(55.2)	42
55-59	13.8	160	*	21
60-64	15.1	73	*	8
65+	13.0	76	*	7
Total 15-24	84.2	1,031	61.1	854
Total 15-49	56.6	3,784	59.2	1,994
Total 50+	17.8	513	49.5	78
Total 15+	52.5	4,297	58.8	2,072

¹ For individuals with more than three partners, having sex with a nonmarital noncohabitating partner is determined using information about the last three partners.

² Relates to Global AIDS Monitoring indicator 2021 3.18: Condom use at last high-risk sex.

() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

* Estimates based on a denominator less than 25 have been suppressed.

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Table 12.4.C Condom use at last sex with a nonmarital, noncohabitating partner: Total

Among adults aged 15 years and older, self-reported condom use with nonmarital, noncohabitating partners in the 12 months before the survey by selected demographic characteristics, SHIMS3 2021

Characteristic	Among adults who reported having sex in the 12 months before the survey		Among adults who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey	
	Percentage who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey ¹	Number	Percentage who reported using a condom the last time they had sex with a such a partner ²	Number
Residence				
Urban	59.7	1,714	61.0	1,014
Rural	52.9	5,962	63.5	2,988
Region				
Hhohho	52.4	1,936	66.8	978
Lubombo	54.6	1,486	62.0	768
Manzini	58.1	2,719	61.9	1,493
Shiselweni	53.0	1,535	59.4	763
Marital status				
Never married	92.0	3,426	64.5	3,120
Married or living together	10.7	3,622	59.7	311
Divorced or separated	95.7	443	52.9	418
Widowed	81.5	147	59.8	118
Education				
No education	28.2	397	63.5	105
Primary	43.5	1,636	59.3	654
Secondary	61.3	4,486	63.4	2,638
More than secondary	55.0	1,153	62.4	604
Wealth quintile				
Lowest	53.1	1,705	62.6	856
Second	56.8	1,864	63.9	981
Middle	59.6	1,627	63.0	902
Fourth	53.2	1,280	63.0	656
Highest	52.4	1,200	60.4	607
Age (years)				
15-19	95.0	559	70.3	528
20-24	88.0	1,276	66.3	1,099
25-29	69.4	1,278	59.1	854
30-34	55.2	1,127	59.4	570
35-39	42.8	1,018	54.6	402
40-44	36.5	715	58.3	238
45-49	26.7	540	73.9	135
50-54	20.2	385	58.8	71
55-59	17.9	309	(64.8)	49
60-64	15.3	221	(71.9)	32
65+	10.9	248	(47.0)	24

Table 12.4.C Condom use at last sex with a nonmarital, noncohabitating partner: Total (continued)

Among adults aged 15 years and older, self-reported condom use with nonmarital, noncohabitating partners in the 12 months before the survey by selected demographic characteristics, SHIMS3 2021

Characteristic	Among adults who reported having sex in the 12 months before the survey		Among adults who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey	
	Percentage who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey ¹	Number	Percentage who reported using a condom the last time they had sex with a such a partner ²	Number
Total 15-24	90.1	1,835	67.5	1,627
Total 15-49	61.6	6,513	62.7	3,826
Total 50+	16.7	1,163	60.7	176
Total 15+	55.1	7,676	62.6	4,002

¹ For individuals with more than three partners, having sex with a nonmarital noncohabitating partner is determined using information about the last three partners.
² Relates to Global AIDS Monitoring indicator 2021 3.18: Condom use at last high-risk sex.
 () Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.
 Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Figure 12.4
 Self-reported sex and condom use among adults aged 15 years and older at last sex with a nonmarital, noncohabitating partner in the 12 months before the survey, SHIMS3 2021

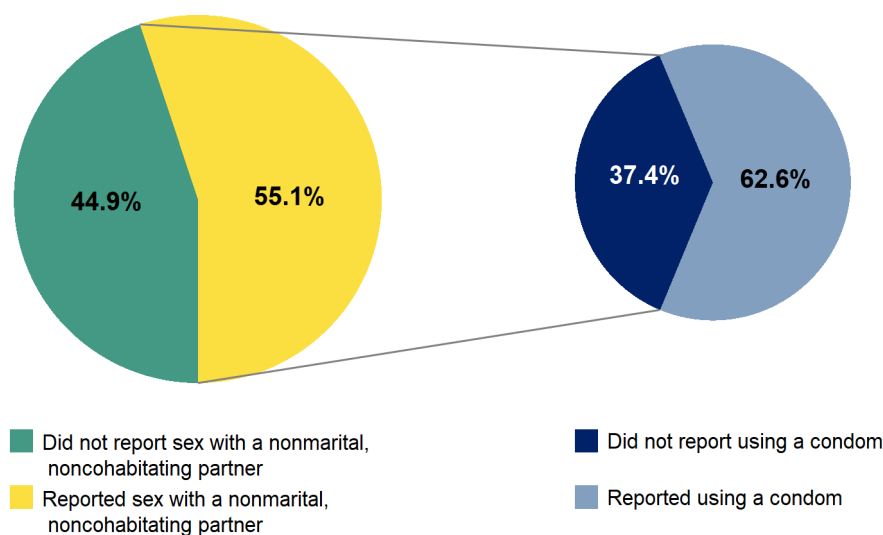


Table 12.5 Male circumcision

Percent distribution of men aged 15 years and older by self-reported circumcision status, by result of SHIMS3 HIV test and selected demographic characteristics, SHIMS3 2021

Characteristic	Circumcised ¹		Uncircumcised	Total	Number
	Medical circumcision	Nonmedical circumcision			
Result of SHIMS3 HIV test					
HIV positive	18.5	2.1	79.3	100.0	876
HIV negative	47.7	1.2	51.1	100.0	3,772
Not tested	37.1	2.4	60.5	100.0	403
Residence					
Urban	43.2	1.9	55.0	100.0	1,003
Rural	41.2	1.3	57.5	100.0	4,048
Region					
Hhohho	42.6	1.8	55.6	100.0	1,372
Lubombo	39.4	0.8	59.8	100.0	1,022
Manzini	43.6	1.6	54.8	100.0	1,666
Shiselweni	39.3	1.5	59.2	100.0	991
Marital status					
Never married	54.3	1.1	44.7	100.0	2,874
Married or living together	25.1	2.0	72.9	100.0	1,782
Divorced or separated	28.5	1.3	70.2	100.0	260
Widowed	10.6	4.2	85.2	100.0	103
Education					
No education	16.1	2.2	81.7	100.0	285
Primary	33.4	2.1	64.5	100.0	1,227
Secondary	46.8	1.2	52.0	100.0	2,910
More than secondary	44.0	1.2	54.8	100.0	626
Wealth quintile					
Lowest	37.5	1.5	61.0	100.0	1,136
Second	43.9	1.5	54.6	100.0	1,306
Middle	40.8	1.4	57.8	100.0	1,079
Fourth	39.7	1.3	58.9	100.0	754
Highest	46.5	1.5	52.0	100.0	775
Age (years)					
15-19	73.3	0.5	26.2	100.0	989
20-24	59.6	0.8	39.6	100.0	792
25-29	43.0	0.9	56.1	100.0	632
30-34	34.0	0.5	65.5	100.0	520
35-39	28.9	0.9	70.2	100.0	498
40-44	29.6	2.9	67.5	100.0	376
45-49	23.8	2.9	73.3	100.0	300
50-54	20.4	4.8	74.8	100.0	212
55-59	20.4	3.7	76.0	100.0	181
60-64	12.9	3.7	83.4	100.0	221
65+	12.6	1.5	86.0	100.0	330

Table 12.5 Male circumcision (continued)

Percent distribution of men aged 15 years and older by self-reported circumcision status, by result of SHIMS3 HIV test and selected demographic characteristics, SHIMS3 2021

Characteristic	Circumcised ¹		Uncircumcised	Total	Number
	Medical circumcision	Nonmedical circumcision			
Total 15-24	66.9	0.7	32.4	100.0	1,781
Total 15-49	47.2	1.1	51.7	100.0	4,107
Total 50+	16.3	3.2	80.6	100.0	944
Total 15+	41.8	1.5	56.8	100.0	5,051

¹Relates to Global AIDS Monitoring indicator 2021 3.16: Prevalence of male circumcision; and PEPFAR indicator VMMC_TOTALCIRC NAT / SUBNAT: Total number of men ever circumcised.

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Figure 12.5

Self-reported male circumcision status among men aged 15 years and older by survey HIV test result, SHIMS3 2021

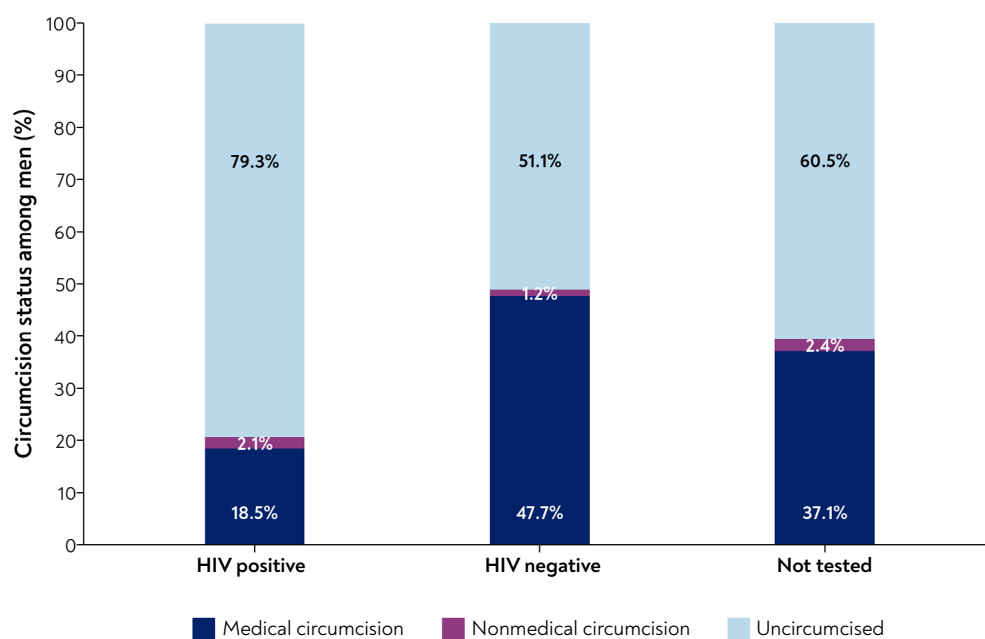


Table 12.6 Self-reported knowledge of pre-exposure prophylaxis

Among persons aged 15 years and older, percentage who reported they had heard of pre-exposure prophylaxis (PrEP), by selected demographic characteristics, SHIMS3 2021

Characteristic	Men		Women		Total	
	Percentage who had heard of PrEP	Number	Percentage who had heard of PrEP	Number	Percentage who had heard of PrEP	Number
Residence						
Urban	44.8	998	55.2	1,313	50.2	2,311
Rural	38.6	4,046	47.0	5,648	43.0	9,694
Region						
Hhohho	45.1	1,368	52.7	1,777	49.0	3,145
Lubombo	39.2	1,022	45.0	1,481	42.2	2,503
Manzini	39.6	1,662	51.6	2,306	46.0	3,968
Shiselweni	36.4	992	44.9	1,397	40.9	2,389
Marital status						
Never married	37.7	2,871	50.9	3,118	44.1	5,989
Married or living together	44.7	1,779	53.0	2,539	48.9	4,318
Divorced or separated	45.1	260	54.4	391	50.3	651
Widowed	31.9	102	29.3	871	29.6	973
Education						
No education	30.1	286	28.3	582	29.0	868
Primary	29.6	1,225	38.4	1,642	34.1	2,867
Secondary	40.6	2,906	53.0	3,866	47.0	6,772
More than secondary	61.5	624	63.9	858	62.8	1,482
Wealth quintile						
Lowest	34.7	1,135	42.5	1,665	38.9	2,800
Second	36.6	1,306	46.0	1,776	41.4	3,082
Middle	43.1	1,079	53.3	1,406	48.3	2,485
Fourth	42.4	752	53.4	1,093	48.4	1,845
Highest	46.6	771	53.4	1,021	50.1	1,792
Age (years)						
15-19	22.1	987	38.8	1,020	30.4	2,007
20-24	44.3	791	60.4	915	52.3	1,706
25-29	51.1	632	65.2	871	58.4	1,503
30-34	51.3	521	64.1	810	57.9	1,331
35-39	47.2	497	56.6	711	52.0	1,208
40-44	44.9	375	55.1	504	50.2	879
45-49	44.5	298	52.0	419	48.4	717
50-54	44.1	211	40.2	379	41.9	590
55-59	42.3	183	34.7	383	37.9	566
60-64	30.9	221	33.2	299	32.2	520
65+	22.6	328	15.6	650	18.3	978
Total 15-24	32.4	1,778	49.0	1,935	40.6	3,713
Total 15-49	41.8	4,101	55.6	5,250	48.8	9,351
Total 50+	33.7	943	28.0	1,711	30.4	2,654
Total 15+	40.4	5,044	49.4	6,961	45.1	12,005

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Table 12.7 Willingness to take pre-exposure prophylaxis

Characteristic	Men		Women		Total	
	Percentage who would take PrEP	Number	Percentage who would take PrEP	Number	Percentage who would take PrEP	Number
Heard of PrEP						
Yes	68.1	1,225	64.3	1,707	66.1	2,932
No	53.6	2,132	46.5	2,157	50.4	4,289
Residence						
Urban	60.7	634	57.6	648	59.3	1,282
Rural	58.3	2,727	53.3	3,219	55.9	5,946
Region						
Hhohho	58.4	938	54.3	1,021	56.5	1,959
Lubombo	52.0	695	45.7	839	49.0	1,534
Manzini	60.9	1,093	56.9	1,250	58.9	2,343
Shiselweni	64.6	635	60.1	757	62.4	1,392
Marital status						
Never married	58.8	2,161	57.2	1,910	58.1	4,071
Married or living together	59.2	991	58.3	1,317	58.8	2,308
Divorced or separated	61.1	135	61.9	147	61.5	282
Widowed	49.2	53	29.2	474	31.7	527
Education						
No education	55.9	158	34.4	326	42.7	484
Primary	56.5	794	48.9	848	53.0	1,642
Secondary	59.2	1,987	57.8	2,177	58.5	4,164
More than secondary	62.4	422	59.4	507	60.9	929
Wealth quintile						
Lowest	61.0	753	54.0	889	57.7	1,642
Second	58.1	915	52.9	1,020	55.7	1,935
Middle	58.7	716	51.0	755	55.3	1,471
Fourth	58.4	484	57.2	618	57.8	1,102
Highest	58.9	493	57.7	585	58.3	1,078
Age (years)						
15-19	54.5	829	56.1	789	55.3	1,618
20-24	61.1	623	61.7	621	61.4	1,244
25-29	62.5	475	64.5	453	63.4	928
30-34	67.1	316	65.2	349	66.3	665
35-39	63.9	275	61.7	271	63.0	546
40-44	62.3	190	58.4	169	60.7	359
45-49	50.6	121	56.4	173	53.5	294
50-54	60.1	81	53.9	176	56.6	257
55-59	58.9	97	44.8	205	50.8	302
60-64	51.5	125	34.7	199	41.1	324
65+	43.5	229	26.8	462	33.2	691

Table 12.7 Willingness to take pre-exposure prophylaxis (continued)

Among persons aged 15 years and older who were HIV negative and had never taken PrEP, percentage who reported they would be willing to take pre-exposure prophylaxis (PrEP) to prevent HIV, by selected demographics characteristics, SHIMS3 2021

Characteristic	Men		Women		Total	
	Percentage who would take PrEP	Number	Percentage who would take PrEP	Number	Percentage who would take PrEP	Number
Total 15-24	57.5	1,452	58.6	1,410	58.0	2,862
Total 15-49	60.3	2,829	60.4	2,825	60.4	5,654
Total 50+	51.2	532	36.2	1,042	42.2	1,574
Total 15+	59.0	3,361	54.5	3,867	56.9	7,228

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Table 12.8 Ever taken pre-exposure prophylaxis

Among persons aged 15 years and older who were HIV negative and had heard of PrEP, percentage who reported they had ever taken pre-exposure prophylaxis (PrEP) to prevent HIV by selected demographic characteristics, SHIMS3 2021

Characteristic	Men		Women		Total	
	Percentage who had ever taken PrEP	Number	Percentage who had ever taken PrEP	Number	Percentage who had ever taken PrEP	Number
Residence						
Urban	8.2	318	11.7	437	10.1	755
Rural	10.0	1,132	12.9	1,702	11.6	2,834
Region						
Hhohho	10.9	461	11.9	614	11.4	1,075
Lubombo	7.8	281	16.3	418	12.1	699
Manzini	8.9	467	12.2	734	10.8	1,201
Shiselweni	9.9	241	9.8	373	9.8	614
Marital status						
Never married	9.4	882	10.9	1,106	10.2	1,988
Married or living together	10.0	481	14.0	815	12.2	1,296
Divorced or separated	7.1	68	24.9	87	16.7	155
Widowed	*	16	7.0	120	6.5	136
Education						
No education	2.1	56	12.8	75	7.6	131
Primary	11.4	240	15.4	356	13.6	596
Secondary	9.2	860	12.8	1,334	11.1	2,194
More than secondary	9.9	294	9.6	373	9.7	667
Wealth quintile						
Lowest	10.4	276	17.5	424	14.2	700
Second	9.3	359	12.3	534	10.9	893
Middle	8.1	329	12.7	440	10.5	769
Fourth	11.0	233	12.1	388	11.6	621
Highest	8.9	253	9.0	353	9.0	606

Table 12.8 Ever taken pre-exposure prophylaxis (continued)

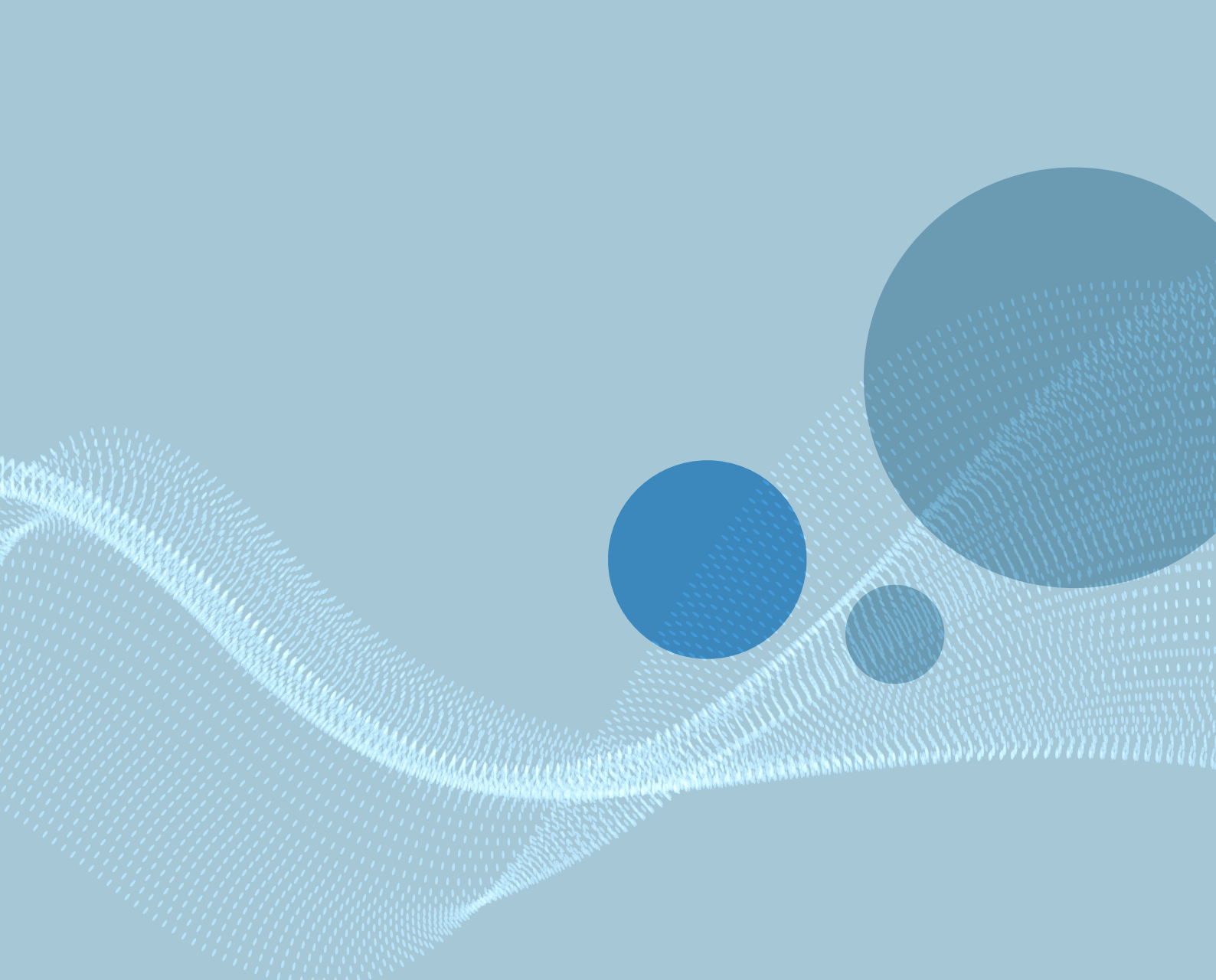
Among persons aged 15 years and older who were HIV negative and had heard of PrEP, percentage who reported they had ever taken pre-exposure prophylaxis (PrEP) to prevent HIV by selected demographic characteristics, SHIMS3 2021

Characteristic	Men		Women		Total	
	Percentage who had ever taken PrEP	Number	Percentage who had ever taken PrEP	Number	Percentage who had ever taken PrEP	Number
Age (years)						
15-19	6.5	207	9.2	369	8.1	576
20-24	11.7	304	11.7	415	11.7	719
25-29	9.7	267	16.8	372	13.4	639
30-34	10.9	195	14.6	289	12.8	484
35-39	11.9	146	16.8	189	14.2	335
40-44	5.0	99	10.9	108	7.6	207
45-49	5.4	56	11.4	107	8.9	163
50-54	(9.4)	35	8.2	78	8.7	113
55-59	(10.9)	43	6.7	72	8.8	115
60-64	(2.1)	47	9.5	69	6.6	116
65+	8.6	51	8.9	71	8.7	122
Total 15-24	9.8	511	10.5	784	10.2	1,295
Total 15-49	9.6	1,274	13.1	1,849	11.4	3,123
Total 50+	8.2	176	8.4	290	8.3	466
Total 15+	9.4	1,450	12.5	2,139	11.1	3,589

() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.
 * Estimates based on a denominator less than 25 have been suppressed.
 Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

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An abstract graphic design featuring a light blue background. A wavy, textured line pattern in a slightly darker shade of blue flows across the upper half of the page. Three solid blue circles of varying sizes are positioned in the upper right quadrant, overlapping the wavy pattern. The largest circle is at the top right, a medium-sized one is to its left, and a smaller one is below the medium one.

13. TUBERCULOSIS, CERVICAL CANCER, AND CHRONIC CONDITIONS

13.1 BACKGROUND

People living with HIV are at a heightened risk for acquiring other diseases such as cervical cancer among women, TB, and common noncommunicable chronic health conditions that can also complicate their clinical care.

Women living with HIV are at greater risk of developing cervical cancer because their weakened immune systems are not able to clear human papillomavirus (HPV) infections. WHO recommends HPV screening and treatment for all sexually-active HIV-positive women.¹ Among women living with HIV, WHO recommends that priority should be given to screening those aged 25-49 years, and that when tools are available to manage women living with HIV aged 50-65 years, those in that age bracket who have never been screened should also be prioritized. SHIMS3 2021 provides population-based rates of screening unavailable from routine clinic data. This chapter presents cervical cancer screening rates by age and sociodemographic characteristics.

With changes in lifestyle and diet, noncommunicable health conditions, including diabetes, hypertension, heart disease, kidney disease, cancers, lung diseases and depression or other mental health issues have become increasingly important causes of illness and mortality in many communities in low- and middle-income countries.² While it is not clear whether these conditions are more common among people living with HIV, there are some data to suggest that people living with HIV may develop comorbidities at younger ages and may be at higher risk of developing multiple chronic comorbidities.³ Regardless, as people live longer with HIV on treatment, their care is more likely to require prevention and/or management of chronic health comorbidities.⁴ In order to inform national program planning, SHIMS3 2021 asked both HIV-negative and HIV-positive participants whether they have been told by a doctor or health worker that they have a chronic health condition.

Finally, TB remains the leading cause of death for people living with HIV.⁵ HIV infection increases a person's susceptibility to TB infection and dramatically increases the risk of progression of latent TB to active disease.^{6,7} A UNAIDS model estimates there were 640 [400-930] TB-related deaths among people living with HIV in Eswatini in 2020.⁸

Information regarding health-seeking behavior and access to services among people living with HIV, particularly for TB health services, can help the HIV program decrease the impact of TB on people living with HIV. This chapter also describes the self-reported uptake of TB services (TB clinic attendance, TB diagnosis, and TB treatment initiation) among people living with HIV in Eswatini. In addition, this chapter presents data on the performance of two of the key collaborative TB/HIV activities recommended by WHO: (1) HIV testing of all of those visiting a TB clinic who are not already aware of their HIV-positive status; and (2) TB symptom screening of all people living with HIV at every HIV clinic visit.⁸

13.2 RESULTS

The following tables report on cervical cancer screening among women living with HIV, the proportion of self-reported chronic health conditions among all survey participants, and the self-reported uptake and delivery of the key TB/HIV services.

Table 13.1 Cervical cancer screening among women living with HIV

Among HIV-positive women aged 15 years and older, percentage who reported they had ever received a cervical cancer screening test by selected demographic characteristics, SHIMS3 2021				
Characteristic	Among HIV-positive women		Among HIV-positive women who reported they had received a cervical cancer screening test	
	Percentage who reported they had ever received a cervical cancer screening test	Number	Percentage with an abnormal result	Number
Residence				
Urban	59.7	397	3.6	226
Rural	50.8	1,622	3.8	784

Table 13.1 Cervical cancer screening among women living with HIV (continued)

Characteristic	Among HIV-positive women		Among HIV-positive women who reported they had received a cervical cancer screening test	
	Percentage who reported they had ever received a cervical cancer screening test	Number	Percentage with an abnormal result	Number
Region				
Hhohho	57.6	481	3.4	267
Lubombo	54.3	427	2.5	220
Manzini	54.8	699	4.4	347
Shiselweni	45.1	412	4.0	176
Marital status				
Never married	48.4	689	2.4	309
Married or living together	58.7	841	4.0	464
Divorced or separated	61.1	198	4.6	113
Widowed	46.4	277	6.0	116
Education				
No education	45.5	203	1.9	79
Primary	49.8	571	4.7	267
Secondary	56.1	1,109	3.3	595
More than secondary	58.7	133	5.3	69
Wealth quintile				
Lowest	49.2	552	4.9	257
Second	50.2	520	2.9	240
Middle	55.0	455	6.3	244
Fourth	58.2	297	0.5	157
Highest	58.9	195	3.1	112
Age (years)				
15-19	7.2	55	*	5
20-24	32.2	140	(0.0)	46
25-29	55.6	252	3.6	132
30-34	62.9	324	1.8	190
35-39	62.8	345	5.7	209
40-44	63.2	278	3.7	171
45-49	65.8	188	4.0	114
50-54	45.1	157	4.2	61
55-59	42.6	127	(6.0)	40
60-64	40.1	61	*	23
65+	24.9	92	*	19
Total 15-24	25.5	195	0.0	51
Total 15-49	57.0	1,582	3.6	867
Total 30-49	63.4	1,135	3.8	684
Total 50+	39.2	437	4.9	143
Total 15+	53.6	2,019	3.7	1,010

¹ Relates to Global AIDS Monitoring indicator 2021 10.8: Cervical cancer screening among women living with HIV; and PEPFAR indicator CXCA_SCRN NAT/SUBNAT: Percentage of HIV-positive women on antiretroviral therapy screened for cervical cancer.

() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

* Estimates based on a denominator less than 25 have been suppressed.

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Figure 13.1

Self-reported cervical cancer screening history and abnormal results among women living with HIV (ages 30-49 years), SHIMS3 2021

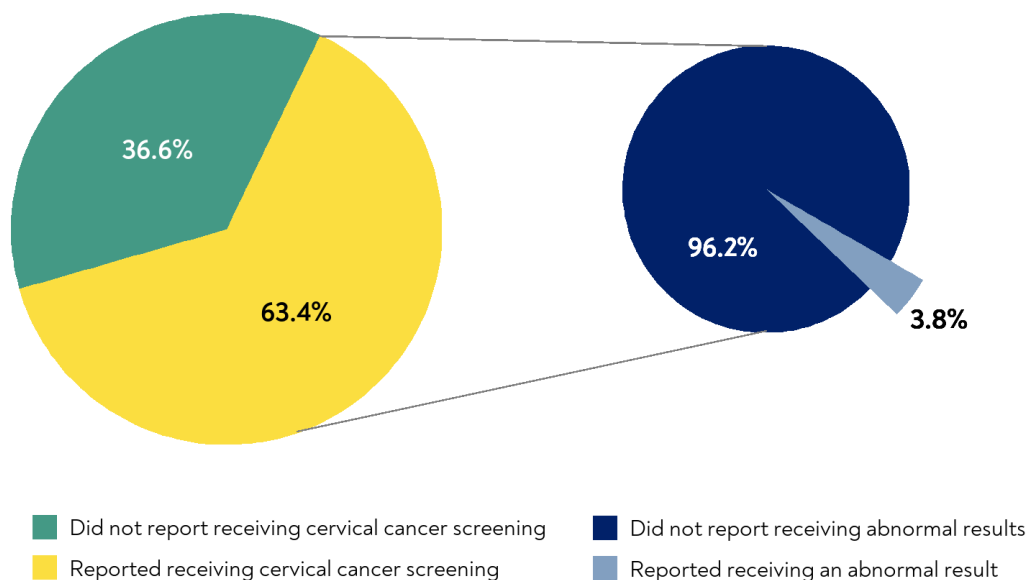


Table 13.2 Chronic health conditions among HIV-positive and HIV-negative individuals

Among HIV-positive and HIV-negative adults aged 15 years and older, percentage indicating that they have ever been told by a doctor or health worker that they have chronic health conditions, by self-reported HIV status and antiretroviral therapy (ART) use (adjusted by detection of an antiretroviral [ARV] in blood), SHIMS3 2021

Chronic health conditions	HIV negative		HIV positive						Total	
	Percentage	Number	Unaware of HIV status ¹		Aware of HIV status and not on ART ¹		Aware of HIV status and on ART ¹		Percentage	Number
High blood sugar or diabetes										
Yes	5.5	487	2.7	4	2.9	2	5.3	143	5.0	149
No	94.5	7,731	97.3	157	97.1	62	94.7	2,487	95.0	2,717
High blood pressure or hypertension										
Yes	7.5	685	3.3	7	3.7	3	7.1	192	6.8	202
No	92.5	7,533	96.7	154	96.3	61	92.9	2,438	93.2	2,664
Heart disease or chronic heart condition										
Yes	1.0	84	1.2	2	0.0	0	0.8	25	0.8	27
No	99.0	8,134	98.8	159	100.0	64	99.2	2,605	99.2	2,839
Kidney disease										
Yes	0.8	66	0.4	1	1.6	1	1.0	23	1.1	27
No	99.2	8,152	99.6	160	98.4	63	99.0	2,607	98.9	2,839

Table 13.2 Chronic health conditions among HIV-positive and HIV-negative individuals (continued)

Among HIV-positive and HIV-negative adults aged 15 years and older, percentage indicating that they have ever been told by a doctor or health worker that they have chronic health conditions, by self-reported HIV status and antiretroviral therapy (ART) use (adjusted by detection of an antiretroviral [ARV] in blood), SHIMS3 2021

Chronic health conditions	HIV negative		HIV positive						Total	
	Percentage	Number	Unaware of HIV status ¹		Aware of HIV status and not on ART ¹		Aware of HIV status and on ART ¹		Percentage	Number
Cancer or tumor										
Yes	0.4	33	0.0	0	1.0	1	0.7	18	0.6	19
No	99.6	8,185	100.0	161	99.0	63	99.3	2,612	99.4	2,847
Lung disease or chronic lung condition										
Yes	0.8	68	1.9	3	0.0	0	0.9	24	1.0	27
No	99.2	8,150	98.1	158	100.0	64	99.1	2,606	99.0	2,839
Depression or mental health condition										
Yes	0.7	53	1.3	2	0.0	0	0.8	21	0.8	23
No	99.3	8,165	98.7	159	100.0	64	99.2	2,609	99.2	2,843
Total 15+ years	100.0	8,218	100.0	161	100.0	64	100.0	2,630	100.0	2,866

¹ Both awareness of HIV-positive status and on treatment status were based upon self-report or having a detectable ARV in the blood.

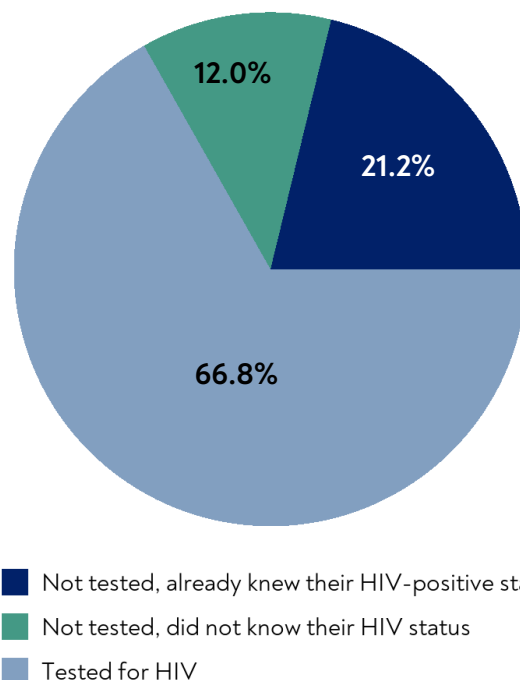
Table 13.3 HIV testing in tuberculosis clinics

Among adults aged 15 years and older who reported visiting a tuberculosis (TB) clinic in the 12 months before the survey, percentage who reported that they were tested for HIV during a TB clinic visit in that period, by sex and self-reported TB diagnosis, SHIMS3 2021

Characteristic	Tested for HIV during a TB clinic visit in the 12 months before the survey	Not tested for HIV during a TB clinic visit in the 12 months before the survey		Total	Number
		Already knew they were HIV positive	Did not know their status		
Sex					
Men	69.6	22.5	7.9	100.0	265
Women	64.0	19.9	16.1	100.0	361
TB diagnosis in the 12 months before the survey					
Diagnosed with TB	77.0	9.2	13.9	100.0	74
Not diagnosed with TB	65.4	22.9	11.8	100.0	552
Total 15+ years	66.8	21.2	12.0	100.0	626

Figure 13.3

Self-reported receipt of HIV testing in tuberculosis clinics among adults (ages 15 years and older) in the 12 months before the survey, SHIMS3 2021

**Table 13.4 Self-reported tuberculosis clinic attendance and services among HIV-positive adults**

Among self-reported HIV-positive adults aged 15 years and older, percentage who reported that they had visited a tuberculosis (TB) clinic in the 12 months before the survey; among those who visited a TB clinic during that period, percentage who were diagnosed for TB; and among those diagnosed with TB in that period, percentage who reported receiving treatment for TB, by sex and selected demographic characteristics, SHIMS3 2021

Characteristic	Among HIV-positive adults		Among HIV-positive adults who visited a TB clinic in the 12 months before the survey		Among HIV-positive adults diagnosed with TB in the 12 months before the survey	
	Percentage who visited a TB clinic in the 12 months before the survey	Number	Percentage diagnosed with TB in the 12 months before the survey	Number	Percentage treated for TB in the 12 months before the survey	Number
Sex						
Men	7.1	834	21.5	62	*	13
Women	7.3	1,972	16.9	142	*	22
Residence						
Urban	5.8	557	(17.2)	32	*	6
Rural	7.8	2,249	18.9	172	(79.2)	29
Region						
Hhohho	8.1	669	21.6	55	*	10
Lubombo	8.9	599	15.9	54	*	7
Manzini	7.0	948	17.1	68	*	13
Shiselweni	4.7	590	(21.5)	27	*	5

Table 13.4 Self-reported tuberculosis clinic attendance and services among HIV-positive adults (continued)

Among self-reported HIV-positive adults aged 15 years and older, percentage who reported that they had visited a tuberculosis (TB) clinic in the 12 months before the survey; among those who visited a TB clinic during that period, percentage who were diagnosed for TB; and among those diagnosed with TB in that period, percentage who reported receiving treatment for TB, by sex and selected demographic characteristics, SHIMS3 2021

Characteristic	Among HIV-positive adults		Among HIV-positive adults who visited a TB clinic in the 12 months before the survey		Among HIV-positive adults diagnosed with TB in the 12 months before the survey	
	Percentage who visited a TB clinic in the 12 months before the survey	Number	Percentage diagnosed with TB in the 12 months before the survey	Number	Percentage treated for TB in the 12 months before the survey	Number
Pregnancy status						
Currently pregnant	3.5	74	*	2	*	0
Not currently pregnant	7.5	1,873	17.4	138	*	22
Age (years)						
15-24	8.8	211	*	19	*	4
25-34	6.0	647	(6.6)	40	*	3
35-44	5.7	883	20.3	54	*	12
45-54	9.1	596	(22.1)	49	*	10
55-64	11.2	312	(16.1)	34	*	5
65+	4.7	157	*	8	*	1
Total 15-24	8.8	211	*	19	*	4
Total 15-49	6.6	2,075	16.4	138	*	23
Total 50+	9.1	731	23.0	66	*	12
Total 15+	7.2	2,806	18.5	204	(80.5)	35

() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

* Estimates based on a denominator less than 25 have been suppressed.

Table 13.5 Tuberculosis symptom screening at HIV care-related clinic visits

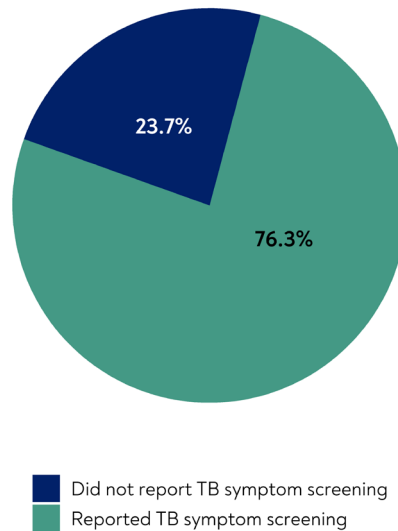
Among self-reported HIV-positive adults aged 15 years and older currently in HIV care, percentage who reported that they were screened for tuberculosis (TB) symptoms during their last HIV care-related clinic visit by sex, SHIMS3 2021

Characteristic	Percentage screened for TB symptoms ¹	Number
Sex		
Men	75.2	786
Women	76.9	1,913
Total 15+ years	76.3	2,699

¹ TB symptoms included persistent cough, fever, night sweats, and weight loss.

Figure 13.5

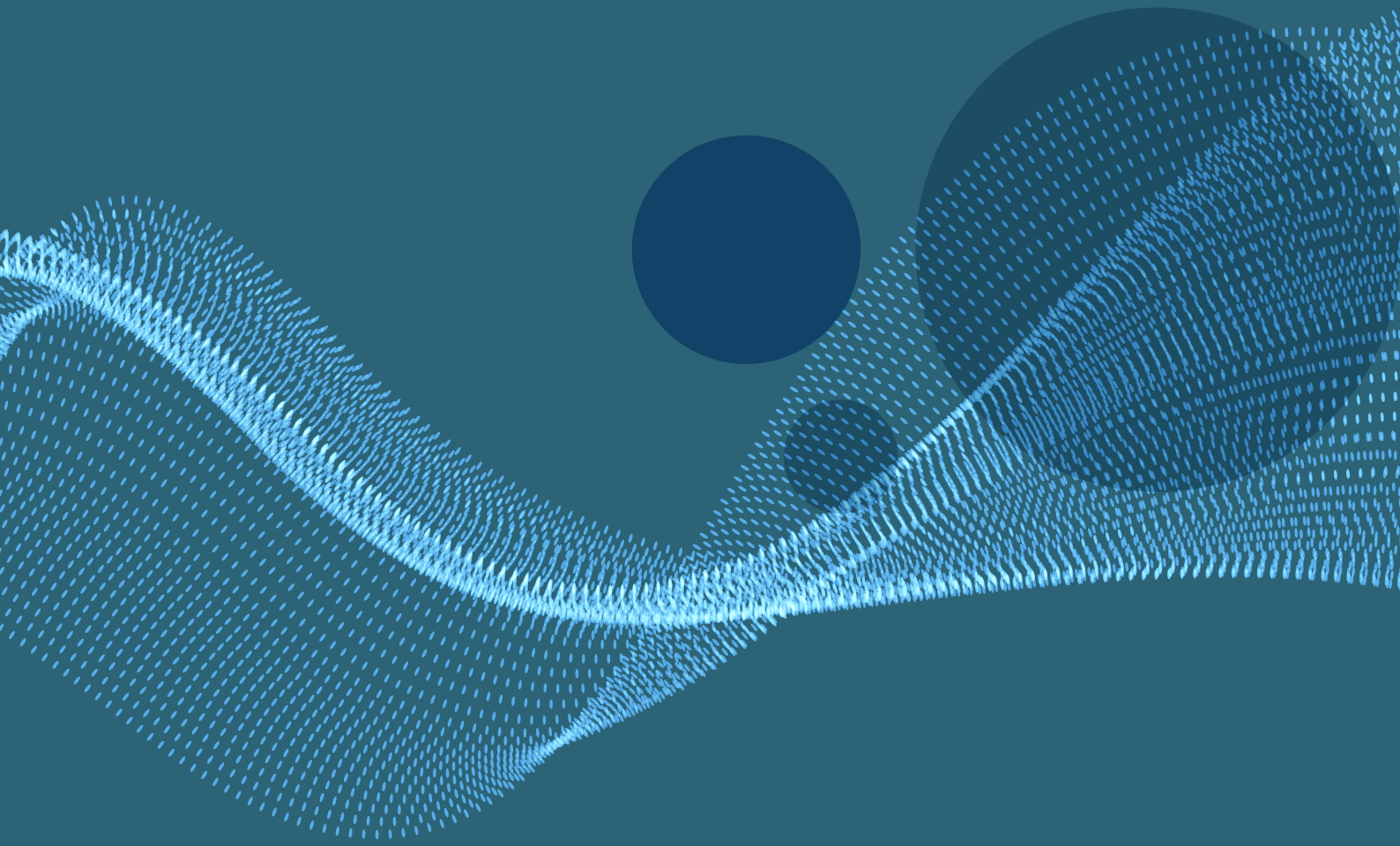
Tuberculosis symptom screening at last HIV care-related clinic visit among adults living with HIV (ages 15 years and older) based on self-report, SHIMS3 2021



Abbreviation: TB, tuberculosis.

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APPENDICES

APPENDIX A SAMPLE DESIGN AND IMPLEMENTATION

Appendix A provides a high-level overview of sampling and weighting procedures for SHIMS3 2021. In-depth details are provided in the SHIMS3 2021 Sampling and Weighting Technical Report, which may be found on the [PHIA Project website](#).

A.1 SAMPLE DESIGN

Overview

The sample design for the SHIMS3 2021 is a stratified multistage probability sample design, with 8 strata defined as the urban and rural portions of each of the country's 4 regions, first-stage sampling units defined by EAs within strata, second-stage sampling units defined by households within EAs, and finally, eligible persons within households. Within each region, the first-stage sampling units (also referred to as primary sampling units [PSUs]) were selected with probabilities proportionate to the 2017 Eswatini Population and Housing Census.¹ The allocation of the sample PSUs to the 8 strata was made in a manner designed to achieve specified precision levels for national estimates of the HIV incidence among adults aged 15-49 years, national and subnational-level estimates of VLS among adults aged 15-49 years living with HIV, and national estimates of VLS among young women aged 15-24 years living with HIV.

The second-stage sampling units were selected from lists of dwelling units/households compiled by trained staff for each of the sampled PSUs. Upon completion of the listing process, a random systematic sample of dwelling units/households was selected from each PSU.

Within the sampled households, all eligible adults, defined as those aged 15 years and older, who were present in the household on the night prior to the interview were included in the study sample for data collection.

Population of Inference

The population of inference for the SHIMS3 2021 is comprised of the de facto household population. The de facto population is comprised of individuals who were present in households (ie, slept in the household) on the night prior to the household interview—as opposed to the usual residents of the household who may not have slept there the night before the survey.

Precision Specifications and Assumptions

The following specifications were used to develop the sample design for the SHIMS3 2021:

- Relative standard error (RSE) of the national estimate of HIV incidence among adults aged 15 to 49 years should be 30% or less.
- 95% CI bounds around the estimated VLS rate among HIV-positive adults aged 15 to 49 years for each of four regions should be ± 0.10 or less.
- 95% CI bounds around the national estimate of VLS rate among all HIV-positive adults aged 15 to 49 years should be ± 0.03 or less.
- 95% CI bounds around the national estimate of VLS rate among all young women aged 15 to 24 years should be ± 0.06 or less.

The following assumptions were used to develop the sample design for the SHIMS3 2021.

- National HIV prevalence rate of 0.272 (27.2%) for adults 15-49 years old that varies by region and urban/rural status.²
- A national HIV prevalence rate of 0.139 (13.9%) for women aged 15 to 24 years old that varies by region and urban/rural status.²
- An annual national incidence rate for adults aged 15-49 years of $P_a = 0.0128$ (1.28%).²
- Stratum-level (region by urban/rural status) incidence rates of P_{ah} , $h = 1, 2, \dots, 8$, which are obtained by adjusting the national incidence rate using the stratum-level (region by urban/rural status) prevalence rates as follows:

$$P_{ah} = (P_h / P) P_a,$$

where p_h and p are the HIV prevalence rates for province h and the country, respectively, and P_a is the annual national incidence rate.

- A mean duration of recent infection of 130 days, yielding an annualization rate of $365/130 = 2.8077$.
- An estimated incidence rate for mean duration of infection = 130 days of $P_m = 0.0128/2.8077 = 0.0046$ (0.46%). The corresponding stratum-level (region by urban/rural status) estimates are obtained by $P_{mh} = P_{ah} / 2.8077$.
- A viral load suppression rate among HIV-positive adults aged 15-49 years of $P_{VLS} = 0.50$ (50%) in each region. This assumption provides a conservative estimate of the underlying population variance associated with VLS rate.

- An intracluster correlation of 0.033 for VLS and 0.039 for prevalence.²
- An intracluster correlation of 0.000 for incidence (source: analyses of prior PHIA surveys).
- Overall sex-age distributions.²
- Regional population distribution obtained from Swaziland Population Projections 2007-2030, Swaziland Central Statistics Office (CSO).
- Estimates from SHIMS2 2016-2017 were used to inform the statistical assumptions.

Selection of the Primary Sampling Units

The first stage SHIMS3 2021 sample was selected from a sampling frame of EAs that originally had been created for the 2017 Eswatini Population Census, and subsequently updated by CSO sometime prior to August 2019. The EAs in the updated sampling frame were generally the same as those created for the 2017 Population Census, except that some EAs were subdivided into separate EAs. The updated sampling frame consisted of slightly over 2,260 EAs containing an estimated 264,856 households as of 2019.

A stratified sample of 200 EAs was selected from the updated EA sampling frame. The following procedure was used to select the EAs for SHIMS3 2021. Within each stratum, the EAs in the updated sampling frame were sorted in the same way they had been sorted in the SHIMS2 2016-2017 frame to the extent feasible, ie, by inkundla within region, ward within inkundla, and finally by EA within ward. The sorting of EAs prior to sample selection induces an implicit geographic substratification within each stratum.

EAs were selected with probabilities proportionate to a measure of size (MOS) equal to the estimated number of households in the EA in 2019. To select the sample from a given region, the cumulative MOS was determined for each EA in the ordered list of EAs, and the sample selections were designated using a random start and a sampling interval equal to the total MOS of the EAs in the stratum divided by the number of EAs to be selected. The resulting sample has the property that the probability of selecting an EA within a stratum is proportional to the MOS of the EA.

Of the 200 EAs selected using this method, 38 had been selected previously for the SHIMS2 2016-2017. Following recommendations by CSO, none of the 38 overlapping EAs was replaced by another EA. There were no out-of-scope or nonresponding PSUs.

Selection of Households

For both sampling and analysis purposes, a household was defined as a group of individuals who reside in a physical structure such as a house, apartment, compound, or homestead, and share in housekeeping arrangements. The physical structure in which people reside was referred to as the dwelling unit, which may have contained more than one household meeting the above definition. Households were eligible for participation in the study if they were located within the sampled EA.

The selection of households for the SHIMS3 2021 involved the following steps: (1) listing the dwelling units/households within the sampled EAs; (2) assigning eligibility codes to the listed dwelling unit/household records; (3) and selecting the samples of dwelling units/households. A description of the household listing process as well as a summary of household eligibility may be found in the SHIMS3 2021 Sampling and Weighting Technical Report on the [PHIA Project website](#).

Selection of households utilized an equal probability design. In order to achieve equal probability samples of households within each of the 8 strata of Eswatini, the sampling rates required to select dwelling units/households within an EA depended on the difference between the MOS used in sampling and the actual number of dwelling units/households found at the time of listing. Thus, application of these within-EA sampling rates could have yielded more or less than the desired number of households in EAs where the sampling MOS differs from the actual listing count. The SHIMS3 2021 Sampling and Weighting Technical Report provides an in-depth description of the equal probability sample design, as well as a detailed summary of the results of the household selection.

Selection of Individuals

The selection of individuals for the SHIMS3 2021 involved compiling a list (the household roster) of all individuals known to reside in the household or who slept in the household during the night prior to data collection. Those who met the eligibility requirements (individuals aged 15 years and older who slept in the household the night before) were offered survey enrollment. Only eligible individuals who were able to provide verbal informed consent/assent to participate in the survey were retained for subsequent weighting and analysis.

The SHIMS3 2021 Sampling and Weighting Technical Report provides a brief description of the process for listing and selecting individuals for participation in the SHIMS3 2021 and presents detailed summaries of the distributions of eligible individuals and participants in individual interviews and HIV testing by strata and age.

A.2 WEIGHTING

Overview

In general, the purpose of weighting survey data from a complex sample design is to (1) compensate for variable probabilities of selection, (2) account for differential nonresponse rates within relevant subsets of the sample, and (3) adjust for possible under-coverage of certain population groups. Weighting is accomplished by assigning an appropriate sampling weight to each responding sampled unit (eg, a household or person), and using that weight to calculate weighted estimates from the sample. The critical component of the sampling weight is the base weight, which is defined as the reciprocal of the probability of including a household or person in the sample. The base weights are used to inflate the responses of the sampled units to population levels and are generally unbiased (or consistent) if there is no nonresponse or noncoverage in the sample. When nonresponse or noncoverage occurs in the survey, weighting adjustments are applied to the base weights to compensate for both types of sample omissions.

Nonresponse is unavoidable in virtually all surveys of human populations. For SHIMS3 2021, nonresponse could have occurred at different stages of data collection, for example, (1) before the enumeration of individuals in the household, (2) after household enumeration and selection of persons, but before completion of the individual interview, and (3) after completion of the interview, but before collection of a viable blood sample.

Noncoverage arises when some members of the survey population have no chance of being selected for the sample. For example, noncoverage can occur if the field operations fail to enumerate all dwelling units during the listing process, or if certain household members are omitted from the household rosters. To compensate for such omissions, post-stratification procedures were used to calibrate the weighted sample counts to available population projections.

Methods

The overall weighting approach for SHIMS3 2021 included several steps. Methods and results for each of the steps below are detailed in the SHIMS3 2021 Sampling and Weighting Technical Report.

Initial checks: Checks of the data files were carried out as part of the survey and data QC, and the probabilities of selection for PSUs and households were calculated and checked.

Creation of jackknife replicates: The variables needed to create the jackknife replicates for variance estimation were established at this point. This step was implemented immediately after the PSU sample was selected. All of the subsequent weighting steps described below were applied to the full sample, and to each of the jackknife replicates.

Calculation of PSU base weights: The weighting process began with the calculation and checking of the sample PSU (EA) base weights as the reciprocals of the overall PSU probabilities of selection.

Calculation of household weights: The next step was to calculate household weights. The household base weights were calculated as the PSU weights times the reciprocal of the within-PSU household selection probabilities. The household base weights were adjusted first to account for dwelling units for which it could not be determined whether the dwelling unit contained an eligible household, and then the responding households had their weights adjusted to account for nonresponding eligible households. This adjustment was made based on the EA the households were in, and the resulting weight was the final household weight.

Calculation of person-level interview weights: Once the household weights were determined, they were used to calculate the individual base weights. The individual base weights were then adjusted for nonresponse among the eligible individuals, with a final adjustment for the individual weights to compensate for under-coverage in the sampling process by post-stratifying (ie, weighting up) to 2020 population projections.

Calculation of person-level HIV testing weights: The individual weights adjusted for nonresponse were, in turn, the initial weights for the HIV testing data sample, with a further adjustment for nonresponse to HIV testing, and a final post-stratification adjustment to compensate for under-coverage.

Application of weighting adjustments to jackknife replicates: All the adjustment processes were applied to the full sample and the replicate samples so that the final set of full sample and replicate weights could be used for variance estimation that accounted for the complex sample design and every step of the weighting process.

A.3 REFERENCES

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2. Government of the Kingdom of Eswatini. Swaziland HIV Incidence Measurement Survey (SHIMS) 2 2016-2017. Final Report. Mbabane, Government of the Kingdom of Eswatini; 2019. <https://phia.icap.columbia.edu/eswatini-final-report/>. Accessed August 30, 2023.

APPENDIX B HIV TESTING METHODOLOGY

B.1 SPECIMEN COLLECTION AND HANDLING

Qualified survey staff collected blood from consenting participants: approximately 14 mL of venous blood or 1 mL of capillary blood using finger-stick from individuals who either refused to give venous blood or for whom venous blood draw failed.

Blood samples were labeled with a unique barcoded participant identification number and stored in temperature-controlled cooler boxes. At the end of each day, samples were transported to the central laboratory for processing into plasma aliquots and dried blood spots (DBS) and frozen for repository storage at -80° Celsius.

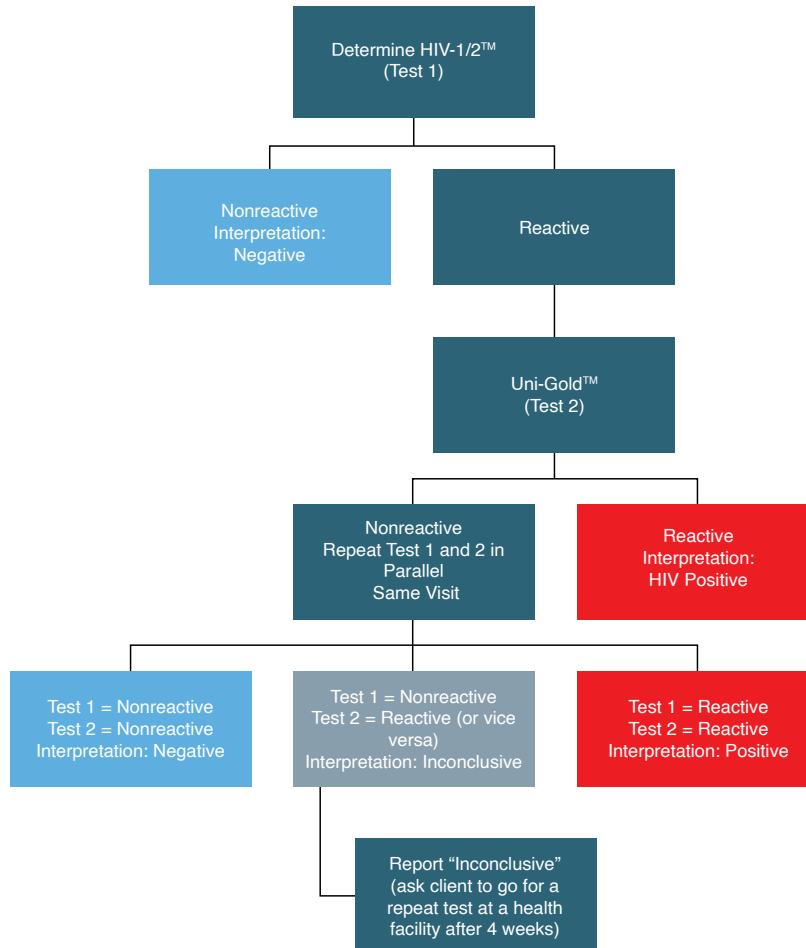
B.2 HOUSEHOLD-BASED PROCEDURES

HIV Rapid Testing

HIV rapid testing was conducted in each household in accordance with Eswatini’s national guidelines which apply two tests in sequence (Figure B.1). As per these guidelines, the survey used a sequential rapid-testing algorithm in the field.

Determine™ HIV-1/2 (Abbott Molecular Inc., Des Plaines, Illinois, United States) was used as a screening test and Uni-Gold™ (Trinity Biotech, plc., Wicklow, Ireland) as a confirmatory test. Individuals with a nonreactive result on the screening test were reported as HIV negative. Individuals with a reactive screening test underwent subsequent testing with Uni-Gold™. Those with reactive results on both the screening and confirmatory tests were classified as HIV positive. Individuals with a reactive Determine™ test followed by a nonreactive Uni-Gold™ test were immediately retested in parallel in the field. If the results during the parallel testing were repeatedly discordant, the individual was classified as inconclusive and referred to a local health facility for repeat testing within two weeks as per the national guidelines. Those with an inconclusive or HIV-positive test result were given a National Health Referral Form which provided different instructions to the health facility for inconclusive; positive, not on ART; and positive, on ART.

Figure B.1
Household-based
HIV testing algorithm,
SHIMS3 2021



Counseling and Referral to Care

Pre- and post-test counseling were conducted in each household in accordance with Eswatini's national guidelines. Survey staff communicated results directly to participants aged 15 years or older. Although parental consent was required for their participation in the survey, adolescents aged 15-17 years could receive their HIV testing results without their parents being present.

All participants who consented to HIV testing were to select a referral health facility prior to testing. Those with an HIV-positive test result were referred to HIV care and treatment at the health facility of their choice. Further, participants who tested HIV positive who reported not being on ART were counseled on linkage to a clinic for ART, care and support, and were referred to their preferred health facility using a National Health Referral Form completed by field staff. All participants were given information and education materials, which provided them with some basic information on HIV and a list of medical facilities and social services organizations in the community.

If a person who self-reported an HIV-positive status tested HIV negative in the survey, additional testing was performed at the central lab to confirm their status (see below). Once the participant's status was confirmed, survey staff returned to the household after consultation with the MOH to share the results and provide counseling to these participants. In other rare cases where participants were provided an incorrect HIV test result or required additional collection of blood to complete testing, households were revisited by qualified personnel to provide participants with correct information and guidance on appropriate actions.

Quality Assurance and Control

To control the quality of the performance of HIV rapid tests, field and laboratory staff performing HIV testing conducted QC testing of a panel of HIV-positive and HIV-negative DTS on a biweekly basis.

To assure the quality of the performance of field staff conducting HIV testing, proficiency testing was conducted once during training and once during the course of the survey, using a panel of masked HIV-positive and HIV-negative DTS. Additionally, sample re-testing was conducted at the central laboratory for the first 25 samples tested by each field staff member. Proficiency in the correct performance and interpretation of the HIV testing algorithm was assessed for each tester. Additionally, sample re-testing was conducted at the central laboratory for the first 25 samples tested by each field staff member.

A limitation of the survey was the limited potential of rapid tests to detect low levels of HIV antibodies among people within the serological window of infection, and in HIV-positive patients on ART. Participants in these two categories were not expected to be a significant source of bias.

B.3 LABORATORY-BASED PROCEDURES

Four regional hubs for the survey were established nationally for management of field supplies, overnight storage of samples and biological waste management. One central laboratory was chosen for sample processing and more specialized tests. At the central laboratory, trained laboratory technologists performed HIV confirmatory testing, Pima CD4 testing, QA testing, QA discrepancy resolution, and processing of whole blood specimens into plasma aliquots and DBS cards for storage at -80° C.

Geenius Testing

All HIV-positive samples, as well as samples with discrepant or indeterminate results, were tested using the Geenius™ HIV 1/2 Supplemental Assay (Bio-Rad, Hercules, California, United States) (Figure B.2). Testing was conducted at the central laboratory in accordance with the manufacturer-specified protocol.

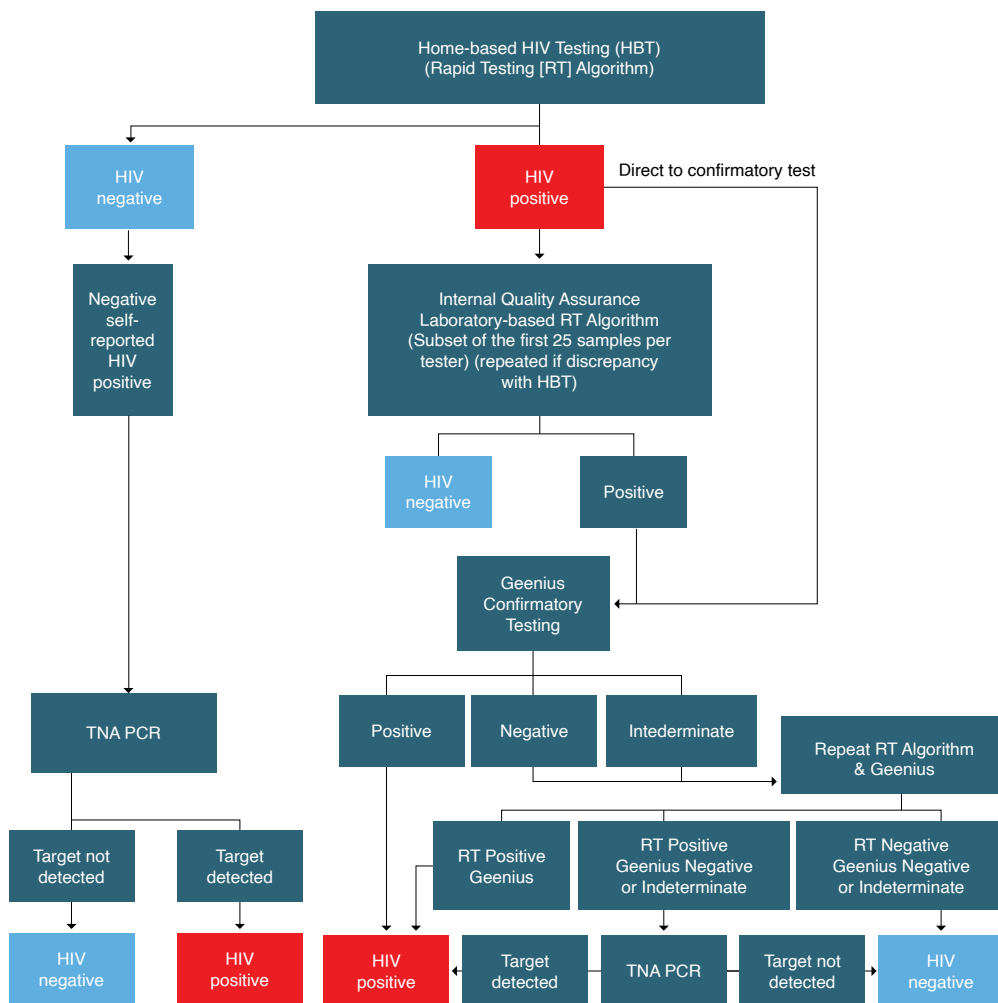
HIV Total Nucleic Acid (TNA) Polymerase Chain Reaction (PCR)

HIV TNA PCR was evaluated for participants who reported an HIV-positive status but tested HIV negative during the survey, as well as for samples that were HIV positive by the rapid testing algorithm but were HIV negative or indeterminate by Geenius testing (Figure B.2). HIV TNA PCR was conducted using the COBAS® AMPLICOR HIV-1 MONITOR Test v1.5 (Roche Molecular Systems, Inc., Branchburg, New Jersey) at NHLS in accordance with the manufacturer-specified protocol.

Classification of Final HIV Status

The algorithm for classification of final HIV status included results from HIV rapid testing, Geenius testing, and HIV TNA PCR (Figure B.2).

Figure B.2
Final HIV Status
Classification
Algorithm, SHIMS3
2021



Abbreviations: TNA PCR, Total Nucleic Acid polymerase chain reaction.

Classification of final HIV status was used to determine estimates for HIV prevalence and to inform estimates for HIV incidence.

CD4 Count Measurement

Blood samples from the participants who tested HIV positive underwent CD4 count measurement at the central laboratory. The measurement was performed using the Pima™ CD4 Analyzer (Abbott Molecular Inc., Chicago, Illinois, United States, formerly Alere).

Viral Load Testing

The HIV-1 viral load (HIV RNA copies per mL) of all HIV-positive participants with plasma samples was measured using the COBAS AmpliPrep/Taqman 96 assay on the COBAS AmpliPrep/COBAS TaqMan (CAP/CTM) HIV-1, v2.0 Test (Roche Molecular Diagnostics, Branchburg, New Jersey, United States). In cases where plasma samples were not available, HIV-1 viral load was performed on dried blood spot (DBS) samples using the COBAS AmpliPrep/COBAS TaqMan (CAP/CTM) Free Virus Elution (FVE) Protocol (Roche Molecular Diagnostics, Branchburg, New Jersey, United States). The COBAS AmpliPrep/TaqMan HIV-1 is a nucleic acid amplification test for the quantification of HIV Type 1 (HIV-1) RNA in human plasma or dried blood spots. Specimen preparation was automated using COBAS AmpliPrep with amplification and detection using TaqMan.

Return of CD4 and Viral Load Results

The return of results coordinator delivered CD4 and viral load results within 8 to 12 weeks to the health facility chosen by each HIV-positive participant. HIV-positive participants were provided with the National Health Referral Form during HBTC for subsequent retrieval of their results. Survey staff also contacted each participant via mobile phones, informing them that their viral load results were available at the chosen facility and further advising them to seek care and treatment.

HIV Recency Testing

Estimation of annualized HIV-1 incidence was based on the classification of confirmed HIV-positive cases as recent or long-term HIV infections. To distinguish recent from long-term HIV infections, the survey used a laboratory-based testing algorithm that employed a combination of assays: an HIV-1 LAg avidity assay, viral load, and ARV detection (Figure B.3).

First, viral load results were assessed on all HIV-positive specimens. Those with viral load $< 1,000$ copies/mL were classified as long-term infections, while those viral load $\geq 1,000$ copies/mL were classified as potential recent infections and LAg avidity assessed. The Sedia HIV-1 LAg-Avidity EIA (Sedia Biosciences Corporation, Portland, Oregon, United States) was used on plasma specimens, while the Maxim HIV-1 Limiting Antigen-Avidity Dried Blood Spot (DBS) EIA (Maxim Biomedical, Bethesda, Maryland, United States) was used on DBS specimens.

In the case of plasma specimens, LAg avidity testing was performed twice, with an initial screening test followed by a confirmatory test. Samples with $OD_n > 2.0$ during initial testing were classified as long-term infections, while those with $OD_n \leq 2.0$ underwent further testing of the specimen in triplicate. Samples with a median $OD_n > 1.5$ during confirmatory testing were classified as long-term infections. In the case of DBS specimens, LAg avidity testing was performed twice, with an initial screening test followed by a confirmatory test. Samples with $OD_n > 2.0$ during initial testing were classified as long-term infections, while those with $OD_n \leq 2.0$ underwent further testing of the specimen in triplicate. Samples with a median $OD_n > 1.0$ during confirmatory testing were classified as long-term infections.

ARV detection data were assessed for the samples with a median $OD_n \leq 1.5$ for plasma and $OD_n \leq 1.0$ for DBS. Those with a detectable ARV were classified as long-term infections and those without were classified as recent infections. Afterwards, LAg avidity testing was performed separately on specimens with a viral load $< 1,000$ copies/mL but the long-term infection classification was retained for all.

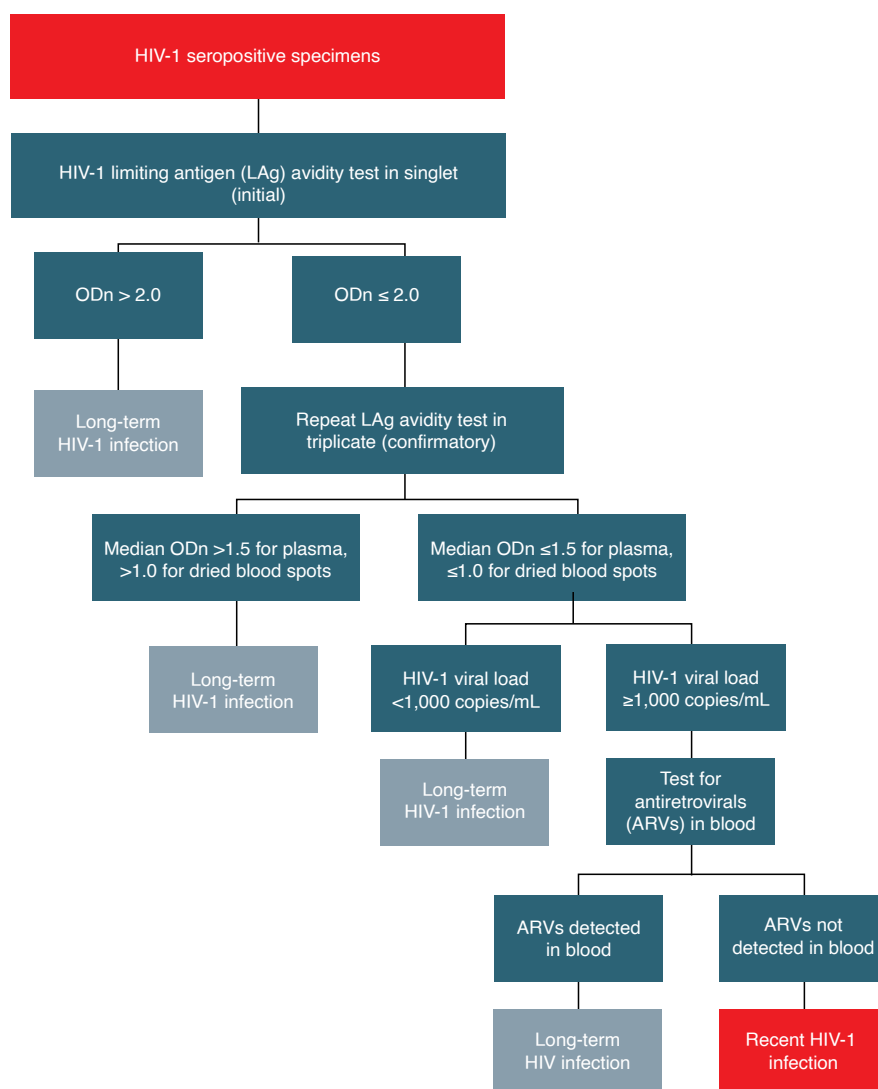


Figure B.3
HIV-1 Recent Infection Testing Algorithm, SHIMS3 2021

HIV Incidence Estimation

Incidence estimates were obtained using the formula recommended by the WHO Incidence Working Group and Consortium for Evaluation and Performance of Incidence Assays.¹ Weighted counts for HIV-negative persons (N); HIV-positive persons (P); numbers tested on the LAg assay (Q); and numbers HIV recent (R) were provided for use in incidence calculations or the UNAIDS Spectrum models (Table B.1). Incidence estimates were calculated using the following parameters: mean duration recent infection = 130 days (95% CI: 118-142 days); proportion false recent = 0.00; and time cutoff = 1 year. In-depth details are provided in the SHIMS3 2021 Technical Report, which may be found online on the [PHIA Project website](#).

Table B.1 Annual HIV incidence auxiliary data: N, P, Q, R, MDRI, PFR, and T

Annual incidence of HIV among adults aged 15-49 years and 15 years and older, by sex and age, using the recent infection testing algorithm (limiting antigen plus viral load plus antiretroviral biomarker testing) SHIMS3 2021				
Age (years)	Number HIV negative ¹ (N)	Number HIV positive ¹ (P)	Number tested on LAg assay ¹ (Q)	Number HIV recent ¹ (R)
Men				
15-24	1,634.4	57.6	57.6	1.0
25-34	898.2	119.8	119.0	1.2
35-49	673.3	387.7	382.9	0.0
50+	590.9	292.1	291.3	0.0
15-49	3,181.7	589.3	583.5	2.2
15+	3,784.0	870.0	863.3	2.3
Women				
15-24	1,629.9	202.1	199.3	9.4
25-34	996.3	560.7	559.2	6.8
35-49	710.2	815.8	810.5	1.1
50+	1,204.5	425.5	422.1	0.0
15-49	3,362.3	1,552.7	1,543.2	17.4
15+	4,558.4	1,986.6	1,973.8	17.9
Total				
15-24	3,271.1	252.9	250.3	10.0
25-34	1,948.6	626.4	624.2	7.3
35-49	1,415.5	1,171.5	1,161.2	0.9
50+	1,784.3	728.7	724.7	0.0
15-49	6,624.0	2,062.0	2,046.8	18.1
15+	8,421.7	2,777.3	2,758.1	18.7

¹ Weighted number.

Note: mean duration recent infection (MDRI) = [130 days (95% CI: 118-142 days) or country-specific]; proportion false recent (PFR) = 0.00; time cutoff (T) = 1 year.

Detection of Antiretrovirals

Qualitative screening for detectable concentrations of ARVs was conducted on DBS specimens from all HIV-positive participants by means of high-resolution liquid chromatography coupled with tandem mass spectrometry. The method used for ARV detection was a modified version of the methodology described by Koal et al.² To qualitatively detect ARVs, a single DBS was eluted, and chromatographic separation carried out on a Luna 5µm PFP column (110 Å, 50 x 2 mm) (Phenomenex, Torrance, California, United States). Each ARV was detected using an API 4000 LC/MS/MS instrument (Applied Biosystems, Foster City, California, United States). Internal standards and in-house QC cut-off samples, including negative controls, were utilized in each run.

This qualitative assay was highly specific, as it separates the parent compound from the fragments, and highly sensitive, with a limit of detection of 0.02 µg/mL for each drug, and a signal-to-noise ratio of at least 5:1 for all drugs. Samples with concentrations above 0.02 µg/mL were considered positive for each ARV. As detection of all ARVs in use at the time of the survey was cost-prohibitive, four ARVs (efavirenz, dolutegravir, nevirapine and lopinavir) were selected as markers for the most prescribed first- and second-line regimens. These ARVs were also selected based on their relatively long half-lives, allowing for a longer period of detection following intake.

ARV detection was performed by the Division of Clinical Pharmacology of the Department of Medicine at the University of Cape Town, South Africa.

Genotyping for Detection of Antiretroviral Drug Resistance and HIV Subtyping

HIV resistance to ARVs was assessed for all HIV-positive participants, including recent cases, those without VLS ($\geq 1,000$ copies/mL; both on treatment and not on treatment), and those with a viral load of 200-999 copies/mL. The findings will be released separately.

B.4 REFERENCES

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3. Koal T, Burhenne H, Römling R, Svoboda M, Resch K, Kaefer V. Quantification of antiretroviral drugs in dried blood spot samples by means of liquid chromatography/tandem mass spectrometry. *Rapid Commun Mass Spectrom*. 2005;19(21):2995-3001. doi.org/10.1002/rcm.2158.

APPENDIX C ESTIMATES OF SAMPLING ERRORS

Estimates from sample surveys are affected by two types of errors: nonsampling errors and sampling errors. Nonsampling errors result from mistakes made during data collection (eg, misinterpretation of an HIV test result) and data management (eg, transcription errors in data entry). While SHIMS3 2021 implemented numerous QA and QC measures to minimize nonsampling errors, these errors are impossible to avoid and difficult to evaluate statistically.

In contrast, sampling errors can be evaluated statistically. The sample of respondents selected for SHIMS3 2021 is only one of many samples that could have been selected from the same population, using the same design and expected size. Each of these samples would yield results that differ somewhat from the results of the actual sample selected. Sampling errors are a measure of the variability between all possible samples. Although the degree of variability is not known exactly, it can be estimated from the survey results.

The standard error, which is the square root of the variance, is the usual measurement of sampling error for a particular statistic (eg, proportion, mean, rate, count). In turn, the standard error can be used to calculate confidence intervals within which the true value for the population can reasonably be assumed to fall. For example, for any given statistic calculated from a sample survey, the value of that statistic will fall within a range of approximately plus or minus two times the standard error of that statistic in 95% of all possible samples of identical size and design.

SHIMS3 2021 utilized a multistage stratified sample design, which required complex calculations to obtain sampling errors. Specifically, a variant of the jackknife replication method was implemented in SAS to estimate variance for proportions (eg, HIV prevalence), rates (eg, annual HIV incidence), and counts (eg, numbers of people living with HIV). To take account of the precision benefits of implicit stratification as fully as possible, the sampled PSUs within each sampling stratum were paired off in the systematic order in which they were selected, treating each pair as a variance-estimation stratum. To fully reflect the sample design, the formation of the variance-estimation strata was applied to all 200 of the sampled PSUs.

Each replication considered all but one cluster in the calculation of the estimates. Pseudo-independent replications were thus created. In SHIMS3 2021, a jackknife replicate was created by randomly deleting one cluster from each variance-estimation stratum and retaining all the clusters in the remaining strata. A total of 98 variance-estimation strata were created by pairing (or occasionally tripling) the sample clusters in the systematic order in which they had been selected. Hence, 98 replications were created. The variance of a sample-based statistic, y , was calculated as follows:

$$\text{var}(y) = \sum_{k=1}^K (y_k - y)^2$$

where y is the full-sample estimate, and y_k is the corresponding estimate for jackknife replicate k ($k = 1, 2, \dots, K$).

In addition to the standard error, the design effect for each estimate was also calculated. The design effect is defined as the ratio of the variance using the given sample design to the variance that would result if a simple random sample had been used. A design effect of 1.0 indicates that the sample design is as efficient as a simple random sample, while a value greater than 1.0 indicates the increase in the variance due to the use of a more complex and less statistically efficient design. Confidence limits for the estimates, which are calculated as

$$y \pm t(0.975; K) \sqrt{\text{var}(y)},$$

where $t(0.975; K)$ is the 97.5th percentile of a t-distribution with K degrees of freedom, were also computed. Sampling errors for selected variables from the SHIMS3 2021 are presented in tables C.1 through C.8, and sampling errors for all survey estimates may be found online on [PHIA website](#). For each variable, sampling error tables include the weighted estimate, unweighted denominator, standard error, design effect, and lower and upper 95% confidence limits.

Table C.1 : Sampling errors: Annual HIV incidence by age, SHIMS3 2021

Age (years)	Weighted estimate (%)	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
Men						
15-24	0.17	0.17	0.98	1.00	0.00	0.50
25-34	0.38	0.38	1.23	1.00	0.00	1.13
35-49	0.00	0.00	0.00	0.00	0.00	1.54
50+	0.00	0.00	0.00	0.00	0.00	1.74
15-49	0.20	0.14	1.15	0.72	0.00	0.48
15+	0.17	0.12	1.17	0.72	0.00	0.41
Women						
15-24	1.63	0.60	1.35	0.37	0.43	2.81
25-34	1.90	0.73	1.03	0.38	0.45	3.33
35-49	0.42	0.42	1.05	0.99	0.00	1.24
50+	0.00	0.00	0.00	0.00	0.00	0.86
15-49	1.45	0.38	1.21	0.27	0.69	2.20
15+	1.11	0.29	1.25	0.27	0.53	1.68
Total						
15-24	0.86	0.30	1.26	0.35	0.26	1.45
25-34	1.05	0.39	1.00	0.37	0.29	1.81
35-49	0.19	0.19	0.92	1.04	0.00	0.57
50+	0.00	0.00	0.00	0.00	0.00	0.58
15-49	0.77	0.19	1.13	0.25	0.39	1.15
15+	0.62	0.16	1.16	0.25	0.31	0.93

Table C.2 Sampling errors: HIV prevalence by age, SHIMS3 2021

Ages (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
Men							
15-19	3.0	950	0.6	1.0	0.2	1.9	4.1
20-24	3.9	742	0.7	1.0	0.2	2.4	5.3
25-29	5.4	562	1.1	1.3	0.2	3.1	7.7
30-34	19.2	456	2.1	1.2	0.1	14.9	23.4
35-39	26.9	443	2.3	1.1	0.1	22.3	31.6
40-44	38.5	348	2.9	1.2	0.1	32.6	44.4
45-49	50.0	270	3.2	1.1	0.1	43.4	56.7
50-54	49.2	190	4.2	1.3	0.1	40.5	57.8
55-59	36.5	172	4.1	1.3	0.1	28.0	45.0
60-64	30.4	209	3.3	1.1	0.1	23.7	37.2
65+	20.7	312	3.0	1.7	0.1	14.4	26.9
Total 15-24	3.4	1,692	0.5	1.1	0.1	2.4	4.4
Total 15-49	15.6	3,771	0.6	1.1	0.0	14.3	16.9
Total 50+	33.1	883	1.9	1.4	0.1	29.2	37.0
Total 15+	18.7	4,654	0.6	1.2	0.0	17.4	20.0

Table C.2 Sampling errors: HIV prevalence by age, SHIMS3 2021 (continued)

Ages (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
Women							
15-19	5.6	975	0.8	1.1	0.1	4.0	7.2
20-24	17.2	857	1.4	1.2	0.1	14.2	20.1
25-29	30.3	810	1.6	1.0	0.1	26.9	33.7
30-34	42.5	747	2.2	1.4	0.1	38.0	47.0
35-39	52.5	662	2.7	1.9	0.1	47.0	58.0
40-44	57.2	477	3.0	1.7	0.1	51.1	63.2
45-49	50.1	387	3.1	1.5	0.1	43.8	56.4
50-54	43.5	357	2.6	1.0	0.1	38.1	48.9
55-59	33.8	363	2.2	0.8	0.1	29.3	38.4
60-64	21.0	285	2.4	1.0	0.1	16.0	26.0
65+	14.7	625	1.5	1.1	0.1	11.6	17.7
Total 15-24	11.0	1,832	0.8	1.1	0.1	9.5	12.6
Total 15-49	31.6	4,915	0.9	1.7	0.0	29.8	33.4
Total 50+	26.1	1,630	1.0	0.8	0.0	24.1	28.2
Total 15+	30.4	6,545	0.7	1.7	0.0	28.8	31.9
Total							
15-19	4.3	1,925	0.5	1.1	0.1	3.3	5.2
20-24	10.5	1,599	0.8	1.0	0.1	8.9	12.0
25-29	18.2	1,372	1.0	0.9	0.1	16.2	20.2
30-34	31.3	1,203	1.6	1.4	0.1	28.1	34.6
35-39	40.0	1,105	1.7	1.4	0.0	36.5	43.6
40-44	48.1	825	2.2	1.6	0.0	43.6	52.6
45-49	50.1	657	2.1	1.1	0.0	45.9	54.3
50-54	46.0	547	2.5	1.4	0.1	40.9	51.2
55-59	35.0	535	2.2	1.1	0.1	30.5	39.5
60-64	24.9	494	1.9	1.0	0.1	20.9	28.8
65+	17.0	937	1.6	1.7	0.1	13.7	20.3
Total 15-24	7.2	3,524	0.4	1.0	0.1	6.3	8.1
Total 15-49	23.7	8,686	0.6	1.6	0.0	22.6	24.9
Total 50+	29.0	2,513	1.0	1.3	0.0	26.8	31.2
Total 15+	24.8	11,199	0.5	1.7	0.0	23.7	25.9

Table C.3 Sampling errors: HIV prevalence by residence and region, SHIMS3 2021

Characteristic	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
Men							
Residence							
Urban	20.08	885	1.49	1.23	0.07	17.01	23.16
Rural	18.11	3,769	0.69	1.22	0.04	16.68	19.53
Region							
Hhohho	15.33	1,265	1.12	1.22	0.07	13.03	17.64
Lubombo	20.88	969	1.44	1.22	0.07	17.91	23.84
Manzini	18.95	1,513	1.21	1.44	0.06	16.46	21.44
Shiselweni	20.72	907	1.89	1.97	0.09	16.82	24.62
Women							
Residence							
Urban	32.86	1,166	1.93	1.97	0.06	28.88	36.84
Rural	29.32	5,379	0.77	1.52	0.03	27.75	30.90
Region							
Hhohho	27.63	1,669	1.35	1.52	0.05	24.85	30.41
Lubombo	29.56	1,413	1.68	1.90	0.06	26.11	33.01
Manzini	32.03	2,170	1.51	2.28	0.05	28.92	35.15
Shiselweni	31.55	1,293	1.79	1.91	0.06	27.87	35.24
Total							
Residence							
Urban	26.70	2,051	1.18	1.45	0.04	24.28	29.13
Rural	24.01	9,148	0.60	1.81	0.03	22.77	25.25
Region							
Hhohho	21.62	2,934	0.95	1.56	0.04	19.66	23.57
Lubombo	25.31	2,382	1.24	1.93	0.05	22.76	27.86
Manzini	25.97	3,683	0.95	1.73	0.04	24.01	27.93
Shiselweni	26.46	2,200	1.62	2.96	0.06	23.13	29.80

Table C.4 Sampling errors: Viral load suppression by age, SHIMS3 2021

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
Men							
15-19	83.91	28	8.05	1.29	0.10	67.35	100.00
20-24	77.41	28	8.06	1.00	0.10	60.82	94.00
25-29	60.20	33	9.29	1.15	0.15	41.07	79.33
30-34	63.82	88	4.75	0.85	0.07	54.04	73.60
35-39	84.55	130	3.15	0.98	0.04	78.06	91.03
40-44	89.53	137	2.57	0.96	0.03	84.24	94.83
45-49	92.23	138	2.12	0.86	0.02	87.87	96.59
50-54	96.81	99	1.61	0.82	0.02	93.49	100.00
55-59	89.23	65	3.71	0.92	0.04	81.58	96.87
60-64	93.10	66	3.25	1.07	0.03	86.41	99.79
65+	95.63	62	3.11	1.42	0.03	89.22	100.00

Table C.4 Sampling errors: Viral load suppression by age, SHIMS3 2021 (continued)

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
15-24	80.47	56	5.72	1.14	0.07	68.69	92.25
25-34	62.93	121	4.32	0.96	0.07	54.03	71.82
35-44	87.25	267	1.86	0.83	0.02	83.42	91.07
45-54	94.22	237	1.38	0.82	0.01	91.39	97.06
55-64	90.79	131	2.58	1.03	0.03	85.48	96.10
Total 15-49	82.38	582	1.51	0.91	0.02	79.28	85.49
Total 50+	94.25	292	1.42	1.08	0.02	91.33	97.17
Total 15+	86.08	874	1.22	1.09	0.01	83.57	88.60
Women							
15-19	74.39	54	6.14	1.05	0.08	61.73	87.04
20-24	76.68	139	3.46	0.92	0.05	69.56	83.80
25-29	78.05	251	2.73	1.09	0.04	72.42	83.68
30-34	91.91	324	1.74	1.31	0.02	88.33	95.48
35-39	91.96	342	1.51	1.05	0.02	88.86	95.06
40-44	94.24	278	1.88	1.81	0.02	90.36	98.12
45-49	96.18	187	1.56	1.24	0.02	92.96	99.40
50-54	97.53	157	1.09	0.77	0.01	95.28	99.78
55-59	95.05	127	2.25	1.36	0.02	90.41	99.69
60-64	92.74	60	4.05	1.44	0.04	84.39	100.00
65+	97.58	92	1.85	1.32	0.02	93.76	100.00
15-24	76.07	193	3.17	1.06	0.04	69.53	82.60
25-34	85.74	575	1.67	1.30	0.02	82.31	89.17
35-44	93.05	620	1.19	1.36	0.01	90.59	95.50
45-54	96.76	344	1.00	1.10	0.01	94.69	98.83
55-64	94.28	187	1.88	1.21	0.02	90.41	98.14
Total 15-49	88.59	1,575	0.79	0.96	0.01	86.97	90.20
Total 50+	96.25	436	0.93	1.05	0.01	94.33	98.18
Total 15+	90.07	2,011	0.65	0.95	0.01	88.73	91.41
Total							
15-19	77.83	82	4.91	1.13	0.06	67.72	87.93
20-24	76.81	167	3.18	0.94	0.04	70.26	83.37
25-29	75.47	284	2.94	1.32	0.04	69.42	81.52
30-34	83.69	412	1.90	1.09	0.02	79.77	87.61
35-39	89.53	472	1.52	1.16	0.02	86.40	92.66
40-44	92.42	415	1.56	1.44	0.02	89.21	95.63
45-49	94.30	325	1.28	0.98	0.01	91.67	96.93
50-54	97.18	256	0.95	0.83	0.01	95.24	99.13
55-59	92.50	192	2.15	1.27	0.02	88.08	96.92
60-64	92.93	126	2.62	1.31	0.03	87.52	98.33
65+	96.64	154	1.76	1.46	0.02	93.02	100.00

Table C.4 Sampling errors: Viral load suppression by age, SHIMS3 2021 (continued)

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
15-24	77.13	249	2.68	1.01	0.03	71.62	82.64
25-34	80.41	696	1.79	1.42	0.02	76.72	84.11
35-44	90.98	887	0.96	0.99	0.01	89.00	92.95
45-54	95.54	581	0.82	0.92	0.01	93.85	97.24
55-64	92.66	318	1.60	1.20	0.02	89.35	95.96
Total 15-49	86.58	2,157	0.75	1.04	0.01	85.04	88.12
Total 50+	95.30	728	0.85	1.17	0.01	93.56	97.05
Total 15+	88.64	2,885	0.62	1.11	0.01	87.36	89.92

Table C.5 Sampling errors: Viral load suppression by residence and region, SHIMS3 2021

Characteristic	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
Men							
Residence							
Urban	86.35	180	2.22	0.75	0.03	81.79	90.92
Rural	85.96	694	1.40	1.13	0.02	83.06	88.85
Region							
Hhohho	87.00	206	2.03	0.74	0.02	82.83	91.18
Lubombo	87.75	189	2.65	1.23	0.03	82.29	93.22
Manzini	84.33	288	2.02	0.88	0.02	80.18	88.49
Shiselweni	86.34	191	3.05	1.49	0.04	80.07	92.61
Women							
Residence							
Urban	86.86	391	1.64	0.92	0.02	83.48	90.23
Rural	91.53	1,620	0.66	0.90	0.01	90.17	92.88
Region							
Hhohho	90.38	480	0.98	0.53	0.01	88.36	92.39
Lubombo	89.67	424	2.06	1.93	0.02	85.44	93.90
Manzini	89.40	697	1.03	0.78	0.01	87.28	91.53
Shiselweni	91.56	410	1.55	1.27	0.02	88.38	94.75
Total							
Residence							
Urban	86.67	571	1.22	0.74	0.01	84.16	89.19
Rural	89.54	2,314	0.74	1.35	0.01	88.02	91.06
Region							
Hhohho	89.21	686	0.98	0.69	0.01	87.18	91.23
Lubombo	88.89	613	1.60	1.58	0.02	85.61	92.18
Manzini	87.69	985	1.05	1.01	0.01	85.52	89.85
Shiselweni	89.65	601	1.71	1.90	0.02	86.12	93.18

Table C.6 Sampling errors: ARV-adjusted 95-95-95 by age (conditional percentages), SHIMS3 2021

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
Men							
Diagnosed							
15-24	91.06	56	3.58	0.87	0.04	83.68	98.43
25-34	74.85	121	4.09	1.06	0.05	66.43	83.26
35-49	93.44	406	1.22	0.99	0.01	90.92	95.96
50+	96.97	292	1.04	1.07	0.01	94.83	99.12
15-49	89.11	583	1.22	0.89	0.01	86.61	91.62
15+	91.56	875	0.93	0.97	0.01	89.65	93.47
On Treatment							
15-24	96.37	50	2.55	0.91	0.03	91.11	100.00
25-34	86.82	94	3.69	1.10	0.04	79.23	94.42
35-49	96.62	379	0.90	0.93	0.01	94.77	98.47
50+	98.31	283	0.77	1.01	0.01	96.72	99.90
15-49	94.78	523	1.00	1.06	0.01	92.71	96.84
15+	95.94	806	0.73	1.09	0.01	94.45	97.43
Viral Load Suppression							
15-24	86.48	48	5.41	1.18	0.06	75.33	97.63
25-34	96.13	83	1.19	0.31	0.01	93.68	98.58
35-49	96.92	366	0.92	1.04	0.01	95.03	98.82
50+	98.53	278	0.69	0.90	0.01	97.11	99.95
15-49	95.81	497	0.88	0.95	0.01	94.01	97.61
15+	96.73	775	0.59	0.85	0.01	95.52	97.94
Women							
Diagnosed							
15-24	83.64	194	2.90	1.19	0.03	77.66	89.61
25-34	93.07	575	1.02	0.92	0.01	90.97	95.16
35-49	98.26	807	0.50	1.15	0.01	97.24	99.28
50+	96.80	436	0.93	1.23	0.01	94.88	98.73
15-49	94.46	1,576	0.63	1.18	0.01	93.17	95.75
15+	94.92	2,012	0.53	1.18	0.01	93.82	96.01
On Treatment							
15-24	96.43	163	1.60	1.20	0.02	93.14	99.73
25-34	96.69	538	1.13	2.13	0.01	94.37	99.01
35-49	98.56	793	0.42	0.99	0.00	97.69	99.43
50+	99.79	424	0.21	0.90	0.00	99.34	100.00
15-49	97.66	1,494	0.45	1.31	0.00	96.74	98.58
15+	98.08	1,918	0.36	1.33	0.00	97.34	98.83
Viral Load Suppression							
15-24	90.38	158	2.48	1.11	0.03	85.28	95.48
25-34	94.60	524	1.00	1.02	0.01	92.54	96.66
35-49	96.42	780	0.78	1.37	0.01	94.81	98.03
50+	99.24	423	0.40	0.89	0.00	98.42	100.00
15-49	95.09	1,462	0.57	1.02	0.01	93.91	96.26
15+	95.92	1,885	0.47	1.08	0.00	94.95	96.89

Table C.6 Sampling errors: ARV-adjusted 95-95-95 by age (conditional percentages), SHIMS3 2021 (continued)

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
Total							
Diagnosed							
15-24	85.43	250	2.24	1.00	0.03	80.83	90.04
25-34	88.81	696	1.33	1.23	0.01	86.08	91.54
35-49	96.38	1,213	0.56	1.10	0.01	95.22	97.54
50+	96.88	728	0.73	1.29	0.01	95.38	98.39
15-49	92.73	2,159	0.60	1.16	0.01	91.49	93.97
15+	93.71	2,887	0.49	1.19	0.01	92.69	94.72
On Treatment							
15-24	96.42	213	1.35	1.12	0.01	93.64	99.19
25-34	94.75	632	1.25	1.98	0.01	92.18	97.32
35-49	97.83	1,172	0.39	0.85	0.00	97.02	98.64
50+	99.08	707	0.38	1.14	0.00	98.30	99.87
15-49	96.76	2,017	0.46	1.34	0.00	95.83	97.70
15+	97.33	2,724	0.36	1.32	0.00	96.60	98.06
Viral Load Suppression							
15-24	89.38	206	2.33	1.17	0.03	84.59	94.17
25-34	94.88	607	0.89	0.98	0.01	93.05	96.70
35-49	96.61	1,146	0.59	1.23	0.01	95.39	97.83
50+	98.91	701	0.37	0.90	0.00	98.14	99.68
15-49	95.31	1,959	0.52	1.20	0.01	94.23	96.39
15+	96.20	2,660	0.40	1.17	0.00	95.37	97.02

Table C.7 Sampling errors: ARV-adjusted 95-95-95 by age (overall percentages), SHIMS3 2021

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
Men							
Diagnosed							
15-24	91.1	56	3.6	0.9	0.0	83.7	98.4
25-34	74.8	121	4.1	1.1	0.1	66.4	83.3
35-49	93.4	406	1.2	1.0	0.0	90.9	96.0
50+	97.0	292	1.0	1.1	0.0	94.8	99.1
15-49	89.1	583	1.2	0.9	0.0	86.6	91.6
15+	91.6	875	0.9	1.0	0.0	89.6	93.5
On Treatment							
15-24	87.7	56	4.2	0.9	0.0	79.2	96.3
25-34	65.0	121	4.6	1.1	0.1	55.6	74.4
35-49	90.3	406	1.4	0.8	0.0	87.5	93.1
50+	95.3	292	1.3	1.1	0.0	92.7	98.0
15-49	84.5	583	1.5	1.0	0.0	81.4	87.5
15+	87.8	875	1.2	1.1	0.0	85.4	90.2

Table C.7 Sampling errors: ARV-adjusted 95-95-95 by age (overall percentages), SHIMS3 2021 (continued)

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
Viral Load Suppression							
15-24	75.9	56	6.1	1.1	0.1	63.3	88.5
25-34	62.5	121	4.3	1.0	0.1	53.5	71.4
35-49	87.5	406	1.5	0.8	0.0	84.4	90.6
50+	93.9	292	1.5	1.1	0.0	90.9	96.9
15-49	80.9	583	1.5	0.8	0.0	77.8	84.0
15+	85.0	875	1.2	1.0	0.0	82.5	87.4
Women							
Diagnosed							
15-24	83.6	194	2.9	1.2	0.0	77.7	89.6
25-34	93.1	575	1.0	0.9	0.0	91.0	95.2
35-49	98.3	807	0.5	1.2	0.0	97.2	99.3
50+	96.8	436	0.9	1.2	0.0	94.9	98.7
15-49	94.5	1,576	0.6	1.2	0.0	93.2	95.8
15+	94.9	2,012	0.5	1.2	0.0	93.8	96.0
On Treatment							
15-24	80.7	194	2.8	1.0	0.0	74.9	86.4
25-34	90.0	575	1.5	1.5	0.0	86.9	93.1
35-49	96.8	807	0.6	1.0	0.0	95.6	98.1
50+	96.6	436	1.0	1.2	0.0	94.6	98.6
15-49	92.3	1,576	0.7	1.2	0.0	90.7	93.8
15+	93.1	2,012	0.6	1.1	0.0	91.9	94.3
Viral Load Suppression							
15-24	72.9	194	3.2	1.0	0.0	66.4	79.4
25-34	85.1	575	1.7	1.3	0.0	81.7	88.6
35-49	93.4	807	1.0	1.3	0.0	91.3	95.4
50+	95.9	436	1.0	1.0	0.0	93.9	97.9
15-49	87.7	1,576	0.8	1.0	0.0	86.0	89.4
15+	89.3	2,012	0.7	1.0	0.0	87.9	90.7
Total							
Diagnosed							
15-24	85.4	250	2.2	1.0	0.0	80.8	90.0
25-34	88.8	696	1.3	1.2	0.0	86.1	91.5
35-49	96.4	1,213	0.6	1.1	0.0	95.2	97.5
50+	96.9	728	0.7	1.3	0.0	95.4	98.4
15-49	92.7	2,159	0.6	1.2	0.0	91.5	94.0
15+	93.7	2,887	0.5	1.2	0.0	92.7	94.7
On Treatment							
15-24	82.4	250	2.2	0.8	0.0	77.9	86.8
25-34	84.1	696	1.7	1.6	0.0	80.6	87.7
35-49	94.3	1,213	0.7	1.1	0.0	92.9	95.7
50+	96.0	728	0.8	1.3	0.0	94.3	97.7
15-49	89.7	2,159	0.7	1.3	0.0	88.2	91.2
15+	91.2	2,887	0.6	1.3	0.0	90.0	92.4

Table C.7 Sampling errors: ARV-adjusted 95-95-95 by age (overall percentages), SHIMS3 2021 (continued)

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
Viral Load Suppression							
15-24	73.6	250	2.7	0.9	0.0	68.0	79.2
25-34	79.8	696	1.8	1.4	0.0	76.2	83.5
35-49	91.1	1,213	0.8	1.0	0.0	89.4	92.7
50+	94.9	728	0.9	1.2	0.0	93.1	96.7
15-49	85.5	2,159	0.7	1.0	0.0	84.0	87.1
15+	87.7	2,887	0.6	1.0	0.0	86.5	89.0

Table C.8 Sampling errors: Number of new infections annually and number of people living with HIV by age, SHIMS3 2021

Age (years)	Weighted estimate	Standard error	Design effect	Relative standard error	Lower confidence limit	Upper confidence limit
Number of new infections annually						
15-24	1,906	650.72	3.31	0.34	563	3,249
25-34	1,413	501.38	2.51	0.35	378	2,448
35-49	182	88.29	0.60	0.48	0	554
50+	0	0	0	0	0	667
15-49	3,503	847.63	2.97	0.24	1,754	5,252
15+	3,504	848.34	3.06	0.24	1,753	5,254
People living with HIV						
15-24	17,125	1027.1	0.98	0.06	15,010	19,241
25-34	43,283	1628.1	1.17	0.04	39,930	46,636
35-49	80,878	2162.6	1.53	0.03	76,424	85,331
50+	43,614	1573.3	1.33	0.04	40,374	46,854
15-49	141,286	3408.6	1.57	0.02	134,266	148,306
15+	184,900	3983.4	1.71	0.02	176,696	193,104

APPENDIX D SURVEY PERSONNEL

Ministry of Health (MOH)

Calvin Dlamini	Lungile Mkhweli	Sipho Makubu
John Myeni	Muhle Dlamini	Trevor Sithole
Lazarus Mbila	Musa Ginindza	Voyivoyi Lukhele
Lenhle Dube	Nokuthula Mahlalela	Vusi Lokotfwako
Lindiwe Cebe	Simangele Masilela	Zandile Mnisi (RIP)

Eswatini National AIDS Programme

Lenhle Dube	Muhle Dlamini
Harriet Mamba	Musa Ginindza

Eswatini Health Laboratory Services

Sindisiwe Dlamini

Environmental Health Department

Bongani Sigudla	Thandeka Matsebula
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Health Promotion Unit

Calvin Dlamini	Lungile Mkhweli	Voyivoyi Lukhele
Lazarus Mphila	Sipho Makhubu	

National Health Research and Innovation Department

Lindiwe Cebe	Simangele Masilela
Nokuthula Mahlalela	Trevor Sithole

Regional Health Management

Abigail Littler	Lizzie Dlamini	Ntombifuthi Dlamini
Alice Maziya	Lobelungu Matsenjwa	Philile Dlodlu
Gijimani Dlamini	Maqhawe Dlamini	Thuli Gamedze
Gugu Mabuza	Njabu Dlamini	Xolile Dlamini

Central Statistical Office (CSO)

Choice Ginindza	Qhawe Tfwala	Robert Fakudze
Larsh Mkontha	Ronald Malangwane	Sabelo Simelane

Core Leadership Group (CLG)

Amos Zwane, CSO	Khanya Mabuza, NERCHA	Ruben Sahabo, ICAP Eswatini
Bongiwe Malinga, MOH	Michelle Adler, CDC/PEPFAR Eswatini	Thembinkosi Shabalala, CSO
Caroline Ryan, CDC/PEPFAR Eswatini	Rejoice Nkambule, MOH	Tim Rwabuhemba, UNAIDS
Cornelia Atsyor, WHO	Rose Crague, UNAIDS	Velephi Okello, MOH
Geoffrey Bisoborwa, WHO		

National Emergency Response Council on HIV/AIDS (NERCHA)

Siphesihle Nkonyanye	Tengetile Dlamini
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US Centers for Disease Control and Prevention (CDC)

Atlanta

Andrew Voetsch
Abraham Ater
Bharat Parekh
Elizabeth Mungai
Faith Ussery
Greg Chang

Hetal Patel
Kristin Brown
Kelsie Decker Pulice
Kathryn Lupoli
Makhabele (Nolana) Woolfork
Megan Stumpf

Mervi Detorio
Myrline Gillot
Stephen McCracken
Steve Kinchen
Victoria Seffren
Trudy Dobbs

Eswatini

Michelle Li

Mitsuki Koh

Samuel Kudhlande

ICAP

Eswatini Technical

Busizwe Doctor Sibandze
Harriet Nuwagaba-Biribonwoha
Mxolisi Dlamini

Nontobeko Gwebu
Siphesihle Shongwe
Ruben Sahabo

Veli Madau
Yvonne Mavengere

Eswatini Administration and Operations

Angel Vilakati
Asande Dlamini
Clinton Simelane
Gabsile Shabangu
Kenneth Hlophe
Macdonald Shongwe

Mduduzi Hlophe
Monde Mhlungu
Mumsy Dube
Neliso Thwala
Nokwazi Mazibuko

Nombuso Mcina Lukhele
Nozipho Dlamini
Qiniso Sibiya
Tengetile Magagula
Thabiso Mkhonta

Regional

Blanche Pitt
Bright Phiri
Eliezer Taluka
Francis Wandera
Frederix Koen
Gerald Mwima
Herbert Longwe
Mandisa Skhosana

Meshack Onuonga
Molibeli Lethoko
Nathan A. Mhungu
Oliver Murangandi
Paradzai Mushore
Pule Mphohle
Reaboka Maraisane

Sakhile Sithole
Shamagonam James
Tafadzwa Dzinamarira
Takura Kupamupindi
Tangang Akamangwa
Temantfulini Mamba
Tepa Nkumbula

New York

Abigail Greenleaf
Andrea Low
Apala Guhathakurta
Blair Gilmartin
Christiana Chang
Chunhui Wang
David Hoos
Donna Lopp
Giles Reid
Gili Hrusa Castillo
Grace Chung
Grace Wygal
Hannah Chung

Jared Garfinkel
John Wylie
Karina Myers
Katherine Evans
Katharine Yuengling
Kiely Flynn
Kiwon Lee
Leticia Froix
Melissa Metz
Monique Millington
Natasha McLeod
Natazia Fistrovic

Neena Philip
Noelle Esquire
Olga Crowley
Rachel Bray
Richard Mitchell
Ridwana Siddika
Shannon Farley
Stephen Delgado
Theo Smart
Thomas Carpino
Wafaa El-Sadr
Yike Zhao M

Community Mobilization Coordinators

Linda Dlamini Makhosonkhe Mavimbela	Ncobile Tsela Nomcebo Dlamini	Winile Dlamini
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Laboratory Team

Laboratory Supervisors

Mpendulo Ngwenya	Nonsindiso Dlamini	Nqobile Sikhondze
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Return of Results Coordinators

Nondumiso Bhembe	Nozipho Mlotshwa	Patrick Lokothwayo
------------------	------------------	--------------------

Linkages Officers

Sicelo Fakudze	Thandeka Mahlalela
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Warehousing and Field Logistics

Fisile Motsa	Siboniso Bhembe	Simphiwe Bhiya
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PHIA Laboratory Fellows

Ange Iradukunda Barclay Obiero Chakuya Gondwe	Edith Kampeta Fred Nyaruhima Goodwill Matsebula	Jack Ogony Rose Makhetha Vivian H. Among
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Field Team

Regional Coordinators

Bhekiwe Shongwe Mandla Malaza	Maphangisa Dlamini Sibusiso Lushaba
----------------------------------	--

Field Team Supervisors/ Data Collector Supervisors

Bongekile Khumalo Bongiwe Dlamini Buiswa Thwala Khayaletu Dlamini Lungelo Nhleko Nompumelelo Ndlangamandla Nomcebo Mdluli	Nondumiso Shongwe Nonjabuliso Manana Nontobeko Simelane Notsile Ngwenya Queeneth Maseko Sandziso Hlophe Slindzile Magongo	Thapelo Phiri Themba Shabangu Vuyani Simelane Winile Ndzabandzaba Yendziwe Khumalo Zethu Sithebe
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Data Collectors

Amelia Manyisa Ayanda Dladla Beksile Mamba Bongiwe Simelane Bongiwe Malambe Bongiwe Tsikati Bongiwe Maureen Maseko Bongiwe Sihle Tsabedze Bonsile Nsimbini Cebile Kunene	Cebile Mkhonta Celenhle Ndzabandzaba Celiwe Masimula Colile Shongwe Colisile Qwabe Dalsy Khumalo David S Fakudze Delisile Zulu Delisile Vilakati Dorah Dlamini	Dorcas Mabuza Dudu Shongwe Faith Nomcebo Dlamini Fezile Simelane Fikile Simelane Fundiswa Mwelase Gcebile Dlamini Gcinaphi Dlamini Gugu Maseko Gugu Zikalala
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Gugulethu Khumalo
 Hlobsile Mgabhi
 Letsiwe Dlamini
 Lindelwa Yolanda Xaba
 Lomakhosi Dlamini
 Lomkhosi Ngwenya
 Mary Dos Santos
 mayibongwe Nkhoma
 Mbali Sifundza
 Mncedisi Mthembu
 Mthunzi Mahlalela
 Mxolisi Kunene
 Ncamsile Shongwe
 Ndumiso Simelane
 Nelsiwe Msibi
 Nobuhle Zwane
 Nokuphila Dlamini
 Nokuthula Kunene
 Nokwanda Myeni
 Nomcebo Ngwenya
 Nomile Masuku
 Nomsa Simelane Dlamini
 Nomvula Magagula
 Nomvula Ndzabanzaba
 Nondumiso Hlophe
 Nonhlanhla Nzima
 Nonhlanhla Bhila-Dlamini
 Nonophile Dlamini
 Nontsetselelo Shabangu
 Nothando Motsa

Nozipho Nomanini Tsabedze
 Nqobile Ngcamphalala
 Ntombenhle Malangwane
 Ntombikayise Vilakati
 Phephile Mkhonta
 Philile Ndzimandze
 Philile Claudia Dlamini
 Phindile Manana
 Pollet Thandwa Mkhonta
 Portia Sacolo
 Qhamkile Matsenjwa
 Qondile Ndzinisa
 Sanele Dube
 Saynile Mamba
 Siboniso Ndzimandze
 Simanga Magongo
 Simangele Methula
 Simiso Lungelo Dlamini
 Siphesihle Nxumalo
 Siphesihle Dlamini
 Smangele Kunene
 Tandzile Sibandze
 Tanele Dlamini
 Tanele Twala
 Tebenguni Nxumalo
 Temalangeneni Patie Dlamini
 Thabiso Fakudze
 Thandazile Mantimakhulu
 Thandeka Dlamini
 Thandeka Thwala

Thandiwe Matse
 Thembi Mkhabela
 Thembi Simelane
 Thobile Motsa
 Thobile Ngwenya
 Thobile Masuku
 Tholakele Gamedze
 Tholakele Dlamini
 Tholakele Nhlabatsi
 Thulile Makhubu
 Tonkhe Ntshalintshali
 Tsepo Mkhwanazi
 Valencia Mpungose
 Wandile Machado
 Wandile Mnisi
 Welile Langa
 Welile Gumbi
 Wendy Khumalo
 Wendy Mahlalela
 Xolile Dlamini
 Xolile Sihlongonyane
 Xolisile Dlamini
 Yolanda Khumalo
 Zandile Methula
 Zandile Hlophe
 Zanele Titiza Dlamini
 Zinhle Mavimbela
 Zodwa Kunene
 Zodwa Mavuso
 Zwile Nxumalo

Drivers

Bheki Maziya
 Bongani Mbamali
 Bongani Mkhathshwa
 Brian Mabuza
 Dennis Fakudze
 Dumisa Fakudze
 Dumsane Mndzebele
 Happyguy Matsebula
 Humphrey Magagula
 Innocent Hlatjwako
 Jabulani Mbuli
 Jabulani Masango
 Jethro Dlamini
 John Motsa
 Jonahanees Nsimbini
 Kenneth Mavuso
 Linda Matsebula
 Linda Simelane
 Lindani Nhlabatsi
 Lwazi Nkambule

Martin Mncina
 Maswati Ngwenya
 Mduduzi Maseko
 Melusi Zikalala
 Mfanizile Gama
 Msizi Dlamini
 Ncebiso Dlamini
 Ndumiso Dube
 Nhlanhla Tfwala
 Njabulo Nkambule
 Phiwayinkhosi Mkhwanazi
 Qiniso Ginindza
 Sakhile Zwane
 Samkeliso Sihlongonyane
 Sandile Hlatjwako
 Sandile Malinga
 Sanele Vilakati
 Senzo Sukati
 Sibusiso Mkhonta
 Sifiso Simelane

Sifiso Dlamini
 Simon Mkhonta
 Sithembiso Mkhonta
 Sive Mndzebele
 Sphamandla Mthethwa
 Terrence Badenhorst
 Thando Dlamini
 Themba Ngwenya
 Thembinkhosi Ndzimandze
 Victus Vilakati
 Vusi Dlamini
 Walter Dlamini
 Wandile Magagula
 Wandile Ncongwane
 Xolani Mathunywa
 Zakhele Dlamini
 Zephania Zwane

Field Support Officers

Simanga Magagula

Nkululeko Masangane

Zanele Sibandze

Data & ICT Officers

Banele Gama
Cleopatra Shaw

Lethokuhle Simelane
Thabiso Mkhonta

Mboneleli Nhlabatsi

Quality Officers

Lunga Dlamini
Nkosingiphile Madolo
Nqobile Nsibande

Nomathemba Shongwe
Sipho Dlamini

Xolani C. Khumalo
Zweli Simelane

APPENDIX E HOUSEHOLD QUESTIONNAIRE

HOUSEHOLD SCHEDULE								
LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX		RESIDENCE		AGE	
INTERVIEWER SAYS: "Please give me the names of the persons who usually live in your household or guests of the household who stayed here last night, starting with the head of the household."								IF LESS THAN 2 YEARS, RECORD IN MONTHS.
AFTER LISTING THE NAME AND RECORDING THE RELATIONSHIP AND SEX FOR EACH PERSON ASK QUESTIONS 2A-2C BELOW TO BE SURE THAT THE SCHEDULE IS COMPLETE.		What is the relationship of (NAME) to the head of the household? SEE CODES BELOW	Is (NAME) Male or Female?	Does (NAME) usually live here?	Did (NAME) sleep here last night?	How old is (NAME) ?	Is age of (NAME) recorded in MONTHS/ YEARS?	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
1		<input type="text"/>	M F	Y N	Y N	<input type="text"/>	MONTHS <input type="text"/> YEARS <input type="text"/>	
2		<input type="text"/>	M F	Y N	Y N	<input type="text"/>	MONTHS <input type="text"/> YEARS <input type="text"/>	
3		<input type="text"/>	M F	Y N	Y N	<input type="text"/>	MONTHS <input type="text"/> YEARS <input type="text"/>	
4		<input type="text"/>	M F	Y N	Y N	<input type="text"/>	MONTHS <input type="text"/> YEARS <input type="text"/>	
5		<input type="text"/>	M F	Y N	Y N	<input type="text"/>	MONTHS <input type="text"/> YEARS <input type="text"/>	
6		<input type="text"/>	M F	Y N	Y N	<input type="text"/>	MONTHS <input type="text"/> YEARS <input type="text"/>	
7		<input type="text"/>	M F	Y N	Y N	<input type="text"/>	MONTHS <input type="text"/> YEARS <input type="text"/>	
8		<input type="text"/>	M F	Y N	Y N	<input type="text"/>	MONTHS <input type="text"/> YEARS <input type="text"/>	
9		<input type="text"/>	M F	Y N	Y N	<input type="text"/>	MONTHS <input type="text"/> YEARS <input type="text"/>	
10		<input type="text"/>	M F	Y N	Y N	<input type="text"/>	MONTHS <input type="text"/> YEARS <input type="text"/>	

HOUSEHOLD SCHEDULE (continued)

CODES FOR COLUMN 3: RELATIONSHIP TO HOUSEHOLD HEAD

01 = HEAD
 02 = WIFE/HUSBAND/PARTNER
 03 = SON OR DAUGHTER
 04 = SON-IN-LAW/DAUGHTER-IN-LAW
 05 = GRANDCHILD
 06 = PARENT
 07 = PARENT-IN-LAW

08 = BROTHER/SISTER
 09 = CO-WIFE
 10 = OTHER RELATIVE
 11 = ADOPTED/
 FOSTER/STEPCHILD
 12 = NOT RELATED
 -8 = DON'T KNOW

LINE NO.	IF AGED 15-17 YEARS EMANCIPATION STATUS	LAST TIME USUAL RESIDENT SLEPT IN HOUSEHOLD	LIVES AWAY	COUNTRY OR PROVINCE	SICK PERSON
	Is (NAME) a child with special circumstances? A child with special circumstances is defined as: a minor between the ages of 15-17 years who is married or has a child of their own and is not currently living with parents, or a minor who is the decision maker in a household where there is no identified adult head of household.	CHECK COLUMN 6, IF NO, when was the last time, (NAME) slept the night in the household? MONTH (SEE CODES BELOW) YEAR	Is (NAME) in another district or country?	Which district or country is (NAME) in currently? (SEE CODES BELOW)	Has (NAME) been very sick for at least 3 months during the past 12 months, that is (NAME) was too sick to work or do normal activities?
(1)	(9)	(10)	(11)	(12)	(13)
1	Y N	<input type="text"/> <input type="text"/> DK = -8 REFUSED = -9	Y N	<input type="text"/> <input type="text"/>	Y N
2	Y N	<input type="text"/> <input type="text"/> DK = -8 REFUSED = -9	Y N	<input type="text"/> <input type="text"/>	Y N
3	Y N	<input type="text"/> <input type="text"/> DK = -8 REFUSED = -9	Y N	<input type="text"/> <input type="text"/>	Y N
4	Y N	<input type="text"/> <input type="text"/> DK = -8 REFUSED = -9	Y N	<input type="text"/> <input type="text"/>	Y N
5	Y N	<input type="text"/> <input type="text"/> DK = -8 REFUSED = -9	Y N	<input type="text"/> <input type="text"/>	Y N
6	Y N	<input type="text"/> <input type="text"/> DK = -8 REFUSED = -9	Y N	<input type="text"/> <input type="text"/>	Y N
7	Y N	<input type="text"/> <input type="text"/> DK = -8 REFUSED = -9	Y N	<input type="text"/> <input type="text"/>	Y N
8	Y N	<input type="text"/> <input type="text"/> DK = -8 REFUSED = -9	Y N	<input type="text"/> <input type="text"/>	Y N
9	Y N	<input type="text"/> <input type="text"/> DK = -8 REFUSED = -9	Y N	<input type="text"/> <input type="text"/>	Y N
10	Y N	<input type="text"/> <input type="text"/> DK = -8 REFUSED = -9	Y N	<input type="text"/> <input type="text"/>	Y N

HOUSEHOLD SCHEDULE (continued)

TICK HERE IF CONTINUATION SHEET USED

CODES FOR COLUMN 10: LAST TIME SLEPT IN HOUSEHOLD

Just to make sure I have a complete listing, are there any other persons such as small children or infants that we have not listed?

YES NO

Are there any other people such as domestic servants, lodgers, or friends who may not be members of your household who usually live here?

YES NO

Are there any guests or temporary visitors staying here, or anyone else who stayed here last night who we have not seen?

YES NO

ADD TO SCHEDULE ←

- 01 = JANUARY
- 02 = FEBRUARY
- 03 = MARCH
- 04 = APRIL
- 05 = MAY
- 06 = JUNE
- 07 = JULY

- 08 = AUGUST
- 09 = SEPTEMBER
- 10 = OCTOBER
- 11 = NOVEMBER
- 12 = DECEMBER
- 8 = DON'T KNOW
- 9 = REFUSED MONTH

IF NO, INTERVIEWER SAYS: "Thank you for confirming the Household Roster is complete."

CODES FOR COLUMN 12: PROVINCE/COUNTRY PRESENTLY IN

- 01 = HHOHHO
- 02 = LUBOMBO
- 03 = MANZINI
- 04 = SHISELWENI
- 05 = SOUTH AFRICA
- 06 = MOZAMBIQUE

- 07 = ZIMBABWE
- 08 = LESOTHO
- 96 = ANOTHER COUNTRY
- 8 = DON'T KNOW
- 9 = REFUSED

HOUSEHOLD SCHEDULE (for minors—skip if a child of special circumstance)							
		IF (NAME) is 0-17 years			IF (NAME) is 15-17		
LINE NO.	SCHOOL	ORPHAN STATUS / PARENT OR GUARDIAN			WRITTEN PERMISSION TO PARTICIPATE		
	Interviewer says: "The next step will be to answer some additional questions for the Household Members who are 0-17 years old." These questions are regarding (NAME). Is (NAME) currently enrolled in school?	Does (NAME)'s natural mother usually live in this household or was a guest last night? IF YES: RECORD MOTHER'S LINE NUMBER. IF NO: RECORD FEMALE GUARDIAN'S LINE NUMBER OR '00' IF FEMALE PARENT OR GUARDIAN NOT PRESENT IN HH.	Does (NAME)'s natural father usually live in this household or was a guest last night? IF YES: RECORD FATHER'S LINE NUMBER. IF NO: RECORD MALE GUARDIAN'S LINE NUMBER OR '00' IF MALE PARENT OR GUARDIAN NOT PRESENT IN HH.	RECORD LINE NUMBER OF PARENT / GUARDIAN WHO CAN GIVE PERMISSION FOR (NAME) TO PARTICIPATE IN THE SURVEY.	You said that there is no adult or parent/guardian in the household who can give permission for (NAME) to participate in the survey. Is this correct?		
(1)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1	Y N	Y N-DK ↓ 17	<input type="text"/>	Y N-DK ↓ 19	<input type="text"/>	<input type="text"/>	Y N
2	Y N	Y N-DK ↓ 17	<input type="text"/>	Y N-DK ↓ 19	<input type="text"/>	<input type="text"/>	Y N
3	Y N	Y N-DK ↓ 17	<input type="text"/>	Y N-DK ↓ 19	<input type="text"/>	<input type="text"/>	Y N
4	Y N	Y N-DK ↓ 17	<input type="text"/>	Y N-DK ↓ 19	<input type="text"/>	<input type="text"/>	Y N
5	Y N	Y N-DK ↓ 17	<input type="text"/>	Y N-DK ↓ 19	<input type="text"/>	<input type="text"/>	Y N
6	Y N	Y N-DK ↓ 17	<input type="text"/>	Y N-DK ↓ 19	<input type="text"/>	<input type="text"/>	Y N
7	Y N	Y N-DK ↓ 17	<input type="text"/>	Y N-DK ↓ 19	<input type="text"/>	<input type="text"/>	Y N
8	Y N	Y N-DK ↓ 17	<input type="text"/>	Y N-DK ↓ 19	<input type="text"/>	<input type="text"/>	Y N
9	Y N	Y N-DK ↓ 17	<input type="text"/>	Y N-DK ↓ 19	<input type="text"/>	<input type="text"/>	Y N
10	Y N	Y N-DK ↓ 17	<input type="text"/>	Y N-DK ↓ 19	<input type="text"/>	<input type="text"/>	Y N

TOTAL ELIGIBLE MEN (ADULTS 15+ YEARS AND EMANCIPATED MINORS)

TOTAL ELIGIBLE WOMEN (ADULTS 15+ YEARS AND EMANCIPATED MINORS)

HOUSEHOLD SCHEDULE (for minors—skip if emancipated) (continued)

LINE NO.	SICKNESS AND RESIDENCE OF BIOLOGICAL PARENTS			MOTHER DEAD OR SICK	FATHER DEAD OR SICK	
	CHECK COLUMN 15, IF COLUMN 15 = 'N' OR 'DK' →25 IF COLUMN 15 = 'Y': Has (NAME) 's natural mother been very sick for at least 3 months during the past 12 months, that is she was too sick to work or do normal activities?			CHECK COLUMN 17, IF COLUMN 17 'N' OR 'DK' →26 IF COLUMN 17 'Y': Has (NAME) 's natural father been very sick for at least 3 months during the past 12 months, that is he was too sick to work or do normal activities?		
		IF MOTHER SICK: Does (NAME) 's natural mother have HIV/AIDS?		IF FATHER SICK: Does (NAME) 's natural father have HIV/AIDS?	IF CHILD'S NATURAL MOTHER HAS DIED (COLUMN 15 'N') OR BEEN SICK (COLUMN 21 'Y'), SELECT Y.	IF CHILD'S NATURAL FATHER HAS DIED (COLUMN 12 'N') OR BEEN SICK (COLUMN 23 'Y'), SELECT Y.
(1)	(21)	(22)	(23)	(24)	(25)	(26)
1	Y N DK ↓ 23	Y N DK	Y N DK ↓ 21	Y N DK	Y N	Y N
2	Y N DK ↓ 23	Y N DK	Y N DK ↓ 21	Y N DK	Y N	Y N
3	Y N DK ↓ 23	Y N DK	Y N DK ↓ 21	Y N DK	Y N	Y N
4	Y N DK ↓ 23	Y N DK	Y N DK ↓ 21	Y N DK	Y N	Y N
5	Y N DK ↓ 23	Y N DK	Y N DK ↓ 21	Y N DK	Y N	Y N
6	Y N DK ↓ 23	Y N DK	Y N DK ↓ 21	Y N DK	Y N	Y N
7	Y N DK ↓ 23	Y N DK	Y N DK ↓ 21	Y N DK	Y N	Y N
8	Y N DK ↓ 23	Y N DK	Y N DK ↓ 21	Y N DK	Y N	Y N
9	Y N DK ↓ 23	Y N DK	Y N DK ↓ 21	Y N DK	Y N	Y N
10	Y N DK ↓ 23	Y N DK	Y N DK ↓ 21	Y N DK	Y N	Y N

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES			SKIP	
SUPPORT FOR ORPHANS AND VULNERABLE CHILDREN						
101	DO NOT READ: CHECK COLUMN 7 IN THE HOUSEHOLD SCHEDULE. ANY CHILD AGE 0-17 YEARS? (SKIP IF EMANCIPATED)	NUMBER OF CHILDREN 0-17 YRS: <input type="text"/> <input type="text"/>			NONE→114	
102	DO NOT READ: CHECK COLUMN 25 IN THE HOUSEHOLD SCHEDULE. ANY CHILD WHOSE MOTHER HAS DIED OR IS VERY SICK?	YES1 NO.....2	YES→104			
103	DO NOT READ: CHECK COLUMN 26 IN THE HOUSEHOLD SCHEDULE. ANY CHILD WHOSE FATHER HAS DIED OR IS VERY SICK?	YES1 NO2	NO→114			
104	Record names, line numbers, and ages of all children 0-17 who are identified in columns 25, and 26 as having a mother and/or father who has died or has been very sick.					
		CHILD (1)	CHILD (2)	CHILD (3)		
	NAME	_____	_____	_____		
	LINE NUMBER (FROM COLUMN 1)	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>		
	AGE (FROM COLUMN 7)	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>		
INTERVIEWER SAYS: "I would like to ask you about any formal, organized help or support for children that your household may have received for which you did not have to pay. By formal, organized support, I mean help provided by someone working for a program. This program could be government, private, religious, charity, or community-based."						
105	Now I would like to ask you about the support your household received for (NAME) . In the last 12 months, has your household received any medical support for (NAME) , such as medical care, supplies, or medicine, for which you did not have to pay?	YES1 NO2 DON'T KNOW-8 REFUSED-9	YES1 NO2 DON'T KNOW-8 REFUSED-9	YES1 NO2 DON'T KNOW-8 REFUSED-9	YES1 NO2 DON'T KNOW-8 REFUSED-9	
106	In the last 12 months, has your household received any medical support for (NAME) , such as companionship, counseling from a trained counselor, or spiritual support, which you received at home and for which you did not have to pay?	YES1 NO2 DON'T KNOW-8 REFUSED-9 NO, DK,R→ 109	YES1 NO2 DON'T KNOW-8 REFUSED-9 NO, DK,R→ 109	YES1 NO2 DON'T KNOW-8 REFUSED-9 NO, DK,R→ 109	YES1 NO2 DON'T KNOW-8 REFUSED-9 NO, DK,R→ 109	
107	Did your household receive any of this emotional or psychological support for (NAME) in the past 3 months?	YES1 NO2 DON'T KNOW-8 REFUSED-9	YES1 NO2 DON'T KNOW-8 REFUSED-9	YES1 NO2 DON'T KNOW-8 REFUSED-9	YES1 NO2 DON'T KNOW-8 REFUSED-9	

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES			SKIP
SUPPORT FOR ORPHANS AND VULNERABLE CHILDREN (continued)					
108	In the last 12 months, has your household received any material support for (NAME) , such as clothing, food, or financial support, for which you did not have to pay?	YES1 NO2 DON'T KNOW-8 REFUSED-9 NO, DK,R→ 111	YES1 NO2 DON'T KNOW-8 REFUSED-9 NO, DK,R→ 111	YES1 NO2 DON'T KNOW-8 REFUSED-9 NO, DK,R→ 111	YES1 NO2 DON'T KNOW-8 REFUSED-9 NO, DK,R→ 111
109	Did your household receive any of this material support for (NAME) in the past 3 months?	YES1 NO2 DON'T KNOW-8 REFUSED-9	YES1 NO2 DON'T KNOW-8 REFUSED-9	YES1 NO2 DON'T KNOW-8 REFUSED-9	YES1 NO2 DON'T KNOW-8 REFUSED-9
110	In the last 12 months, has your household received any social support for (NAME) such as help in household work, training for a caregiver, or legal services, for which you did not have to pay?	YES1 NO2 DON'T KNOW-8 REFUSED-9 NO, DK,R→ 113	YES1 NO2 DON'T KNOW-8 REFUSED-9 NO, DK,R→ 113	YES1 NO2 DON'T KNOW-8 REFUSED-9 NO, DK,R→ 113	YES1 NO2 DON'T KNOW-8 REFUSED-9 NO, DK,R→ 113
111	Did your household receive any of this social support for (NAME) in the past 3 months?	YES1 NO2 DON'T KNOW-8 REFUSED-9	YES1 NO2 DON'T KNOW-8 REFUSED-9	YES1 NO2 DON'T KNOW-8 REFUSED-9	YES1 NO2 DON'T KNOW-8 REFUSED-9
112	In the last 12 months, has your household received any support for (NAME) 's schooling, such as allowance, free admission, books, or supplies, for which you did not have to pay?	YES1 NO, DID NOT RECEIVE SUPPORT2 NO, CHILD DOES NOT ATTEND SCHOOL3 DON'T KNOW-8 REFUSED-9	YES1 NO, DID NOT RECEIVE SUPPORT2 NO, CHILD DOES NOT ATTEND SCHOOL3 DON'T KNOW-8 REFUSED-9	YES1 NO, DID NOT RECEIVE SUPPORT2 NO, CHILD DOES NOT ATTEND SCHOOL3 DON'T KNOW-8 REFUSED-9	YES1 NO, DID NOT RECEIVE SUPPORT2 NO, CHILD DOES NOT ATTEND SCHOOL3 DON'T KNOW-8 REFUSED-9

CONTINUE TO NEXT CHILD IF OTHER CHILDREN WHOSE MOTHER AND/OR FATHER HAS DIED OR IS VERY SICK.

MATRIX END

INTERVIEWER SAYS: "Thank you for the information regarding **(NAME)**."

IF THERE IS ANOTHER CHILD 0-17 YEARS IN THE HOUSEHOLD WHO HAS BEEN IDENTIFIED IN COLUMN 17 AS HAVING A MOTHER/FATHER WHO HAS DIED OR IS VERY SICK BESIDES (NAME) → CONTINUE TO 106 AND ASK ABOUT THE NEXT CHILD.

INTERVIEWER SAYS: "Next, I would like to ask you about **(NAME)**".

TICK IF CONTINUATION SHEET REQUIRED.

IF NO OTHER CHILDREN, CONTINUE HOUSEHOLD INTERVIEW.

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
HOUSEHOLD DEATHS			
113	Now I would like to ask you more questions about your household. Has any usual resident of your household died since January 1, 2019?	YES1 NO2 DON'T KNOW-8 REFUSED-9	NO, DK, R → 201

114	How many usual household residents died since January 1, 2019?	NUMBER OF DEATHS	<input type="text"/> <input type="text"/>
-----	--	------------------	---

ASK 116-119 AS APPROPRIATE FOR EACH PERSON WHO DIED. IF THERE WERE MORE THAN 3 DEATHS USE ADDITIONAL QUESTIONNAIRES.

115	What was the name of the person who died (most recently/before him/her)? (Swipe forward to enter DON'T KNOW or REFUSED.)	NAME 1 ST DEATH _____	NAME 2 ND DEATH _____	NAME 3 RD DEATH _____
-----	--	-------------------------------------	-------------------------------------	-------------------------------------

116	When did (NAME) die? Please give your best guess.	DAY	<input type="text"/>	DAY	<input type="text"/>	DAY	<input type="text"/>
		MONTH	<input type="text"/>	MONTH	<input type="text"/>	MONTH	<input type="text"/>
		YEAR	<input type="text"/>	YEAR	<input type="text"/>	YEAR	<input type="text"/>
		DON'T KNOW.....-8	DON'T KNOW.....-8	DON'T KNOW.....-8	DON'T KNOW.....-8		
		REFUSED.....-9	REFUSED.....-9	REFUSED.....-9	REFUSED.....-9		

117	Was (NAME) male or female?	MALE1	MALE1	MALE1
		FEMALE.....2	FEMALE.....2	FEMALE.....2
		DON'T KNOW.....-8	DON'T KNOW.....-8	DON'T KNOW.....-8
		REFUSED.....-9	REFUSED.....-9	REFUSED.....-9

118	How old was (NAME) when (he/she) died? RECORD DAYS IF LESS THAN 1 MONTH, MONTHS IF LESS THAN 1 YEAR, AND COMPLETED YEARS IF 1 YEAR OR MORE.	DAYS	<input type="text"/>	DAYS	<input type="text"/>	DAYS	<input type="text"/>
		MONTHS	<input type="text"/>	MONTHS	<input type="text"/>	MONTHS	<input type="text"/>
		YEARS	<input type="text"/>	YEARS	<input type="text"/>	YEARS	<input type="text"/>
		DON'T KNOW.....-8	DON'T KNOW.....-8	DON'T KNOW.....-8	DON'T KNOW.....-8		
		REFUSED.....-9	REFUSED.....-9	REFUSED.....-9	REFUSED.....-9		

CONTINUE TO NEXT DEATH ACCORDING UP TO THE NUMBER REPORTED FROM 115.

TICK IF CONTINUATION SHEET REQUIRED.

INTERVIEWER SAY: "Now I would like to ask you more questions about your household."

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
HOUSEHOLD CHARACTERISTICS			
201	What is the <u>main</u> source of drinking water for members of your household?	<p>PIPED WATER</p> PIPED INTO DWELLING11 PIPED TO YARD/PLOT12 PUBLIC TAP/STANDPIPE13 TUBE WELL OR BOREHOLE 21 <p>DUG WELL</p> PROTECTED WELL..... 31 UNPROTECTED WELL32 <p>WATER FROM SPRING</p> PROTECTED SPRING..... 41 UNPROTECTED SPRING42 RAINWATER.....51 TANKER TRUCK61 CART WITH SMALL TANK.....71 SURFACE WATER (RIVER/DAM/LAKE/POND / STREAM/CANAL) 81 BOTTLED WATER91 OTHER (SPECIFY)96 <hr/> DON'T KNOW -8 REFUSED -9	
202	What kind of toilet facility do members of your household usually use?	FLUSH OR POUR FLUSH TOILET.....11 TRADITIONAL PIT LATRINE.....21 VENTILATED IMPROVED PIT LATRINE (VIP)22 NO FACILITY/BUSH/FIELD61 OTHER (SPECIFY)96 <hr/> DON'T KNOW -8 REFUSED -9	IF NO FACILITY/ BUSH/ FIELD = DK, R→204
203	Do you share this toilet facility with other households?	YES 1 NO.....2 DON'T KNOW -8 REFUSED -9	
204	Does your household have:	ELECTRICITYA A WORKING RADIOB A WORKING TELEVISION C A WORKING TELEPHONE/MOBILE TELE-PHONE.....D A WORKING REFRIGERATOR.....E NONE OF THE ABOVEF DON'T KNOWY REFUSED Z	

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
HOUSEHOLD CHARACTERISTICS (continued)			
205	What type of fuel does your household mainly use for cooking?	ELECTRICITY1 LPG / NATURAL GAS2 BIOGAS3 PARAFFIN / KEROSENE.....4 COAL, LIGNITE.....5 CHARCOAL FROM WOOD6 FIREWOOD / STRAW7 DUNG8 AGRICULTURAL CROPS9 NO FOOD COOKED IN HOUSEHOLD95 OTHER (SPECIFY)96 <hr/> DON'T KNOW -8 REFUSED -9	
206	Main material of floor (RECORD OBSERVATION).	NATURAL FLOOR EARTH / SAND / MUD11 DUNG12 RUDIMENTARY FLOOR WOOD PLANKS 21 PALM / BAMBOO 22 FINISHED FLOOR PARQUET OR POLISHED WOOD 31 VINYL OR ASPHALT STRIP32 CERAMIC TILES33 CEMENT /TERAZO34 CARPET 35 OTHER (SPECIFY)96 <hr/>	
207	Main material of the roof (RECORD OBSERVATION).	NATURAL ROOFING NO ROOF11 THATCH / GRASS12 RUDIMENTARY ROOFING CORRUGATED IRON (MABATI)21 TIN CANS.....22 FINISHED ROOFING ASBESTOS SHEET / CEMENT FIBER..... 31 CONCRETE32 TILES33 OTHER (SPECIFY)96 <hr/>	

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
HOUSEHOLD CHARACTERISTICS (continued)			
208	Main material of the exterior walls record observation.	<p>NATURAL WALLS</p> <p>NO WALLS11</p> <p>CANE/TREE TRUNKS12</p> <p>DUNG / MUD13</p> <p>RUDIMENTARY WALLS</p> <p>BAMBOO WITH MUD21</p> <p>STONE WITH MUD.....22</p> <p>PLYWOOD/CARDBOARD23</p> <p>CARTON24</p> <p>REUSED WOOD25</p> <p>FINISHED WALLS</p> <p>CEMENT.....31</p> <p>STONE WITH LIME/CEMENT32</p> <p>BRICKS33</p> <p>CEMENT BLOCKS.....34</p> <p>WOOD PLANKS/SHINGLES35</p> <p>OTHER (SPECIFY)96</p>	
209	How many rooms are used for sleeping?	NUMBER OF ROOMS:	<input type="text"/> <input type="text"/>
210	Does any member of your household own: (Read all responses aloud. Select all that apply.)	<p>A BICYCLE.....A</p> <p>A WORKING MOTORCYCLE OR MOTOR SCOOTER.....B</p> <p>A WORKING CAR OR TRUCKC</p> <p>A WORKING BOAT WITH A MOTORD</p> <p>COWSE</p> <p>GOATS/SHEEPF</p> <p>POULTRY (EG, DUCKS, CHICKENS).....G</p> <p>OTHER ANIMALS (HORSES, DONKEYS, CAMELS, ETC)H</p> <p>NONE OF THE ABOVE.....W</p> <p>DON'T KNOW.....Y</p> <p>REFUSEDZ</p>	

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
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ECONOMIC SUPPORT

Now I will ask you questions on economic support you have received.

301	Has your household received any of the following forms of financial assistance, material goods or food support in the last 12 months? (INTERVIEWER: READ THE RESPONSES ALOUD SELECT UP TO THREE RESPONSES FOR THE MOST IMPORTANT SOURCES OF OUTSIDE SUPPORT.)	NOTHING.....	A	IF NOTHING, DON'T KNOW, REFUSED →END OF SECTION
		CASH TRANSFER (E.G. PENSIONS, DISABILITY GRANTS, CHILD GRANT).....	B	
		ASSISTANCE FOR SCHOOL FEES.....	C	
		MATERIAL SUPPORT FOR EDUCATION (E.G. UNIFORMS, SCHOOL BOOKS, EDUCATION, TUITION SUPPORT, BURSARIES).....	D	
		INCOME GENERATION SUPPORT IN CASH OR KIND (EG, AGRICULTURAL INPUTS).....	E	
		FOOD ASSISTANCE PROVIDED AT THE HOUSEHOLD OR EXTERNAL INSTITUTION.....	F	
		MATERIAL OR FINANCIAL SUPPORT FOR SHELTER.....	G	
		SOCIAL PENSION.....	H	
		REMITTANCES.....	I	
		OTHER (SPECIFY).....	X	

		DON'T KNOW.....	Y	
		REFUSED.....	Z	

302	Coronavirus is a highly contagious virus spreading primarily from person to person through small droplets from the nose or mouth, which are expelled when a person with COVID-19 coughs, sneezes, or speaks. Were any of these economic support-related to COVID-19?	YES.....	1
		NO.....	2
		DON'T KNOW.....	-8
		REFUSED.....	-9

END OF HOUSEHOLD INTERVIEW

INTERVIEWER SAY: "This is the end of the household survey. Thank you very much for your time and for your responses. Do you have any questions for me at this time? "

END TIME

END RECORD THE END TIME.

--	--	--	--

USE 24 HOUR TIME.

HOUR:

--	--

IF START TIME IS 3:12 PM, RECORD 15 HOURS, 12 MINUTES, NOT 03 HOURS, 12 MINUTES.

MINUTES:

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INTERVIEWER OBSERVATIONS:

TO BE COMPLETED AFTER THE INTERVIEW:

COMMENTS ABOUT RESPONDENT:

COMMENTS ABOUT SPECIFIC QUESTIONS:

GENERAL QUESTIONS:

APPENDIX F ADULT QUESTIONNAIRE

NO	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
LANGUAGE			
Interviewer says: "Thank you for agreeing to participate in this survey. The first set of questions is about your life in general. Afterwards, we will move on to other topics."			
L1	LANGUAGE OF QUESTIONNAIRE	ENGLISH =1 SISWATI =2	
L2	LANGUAGE OF INTERVIEW	ENGLISH =1 SISWATI =2	
L3	NATIVE LANGUAGE OF PARTICIPANT	ENGLISH =1 SISWATI =2 OTHER (SPECIFY) =96	
MODULE ONE: RESPONDENT BACKGROUND			
Interviewer says: "Thank you for agreeing to participate in this survey. The first set of questions is about your life in general. Afterwards, we will move on to other topics."			
101	Have you ever attended school?	YES=1 NO=2 DON'T KNOW=-8 REFUSED=-9	IF NO, DON'T KNOW, REFUSED → 104
102	Are you currently enrolled in school?	YES=1 NO=2 DON'T KNOW=-8 REFUSED=-9	
103	What is your highest level of school you attended?	LEVEL 0 (GRADE 0) = 1 LEVEL 1 (PRIMARY, YEAR 1) = 2 LEVEL 1 (PRIMARY, YEAR 2) = 3 LEVEL 1 (PRIMARY, YEAR 3) = 4 LEVEL 1 (PRIMARY, YEAR 4) = 5 LEVEL 1 (PRIMARY, YEAR 5) = 6 LEVEL 1 (PRIMARY, YEAR 6) = 7 LEVEL 1 (PRIMARY, YEAR 7) = 8 LEVEL 2 (SECONDARY, FORM 1) = 9 LEVEL 2 (SECONDARY, FORM 2) = 10 LEVEL 2 (SECONDARY, FORM 3) = 11 LEVEL 2 (SECONDARY, FORM 4) = 12 LEVEL 2 (SECONDARY, FORM 5) = 13 LEVEL 2 (SECONDARY, FORM 6) = 14 LEVEL 3 (SHORT CYCLE TERTIARY) =15 LEVEL 3 (BACHELOR'S PROGRAM) =16 LEVEL 3 (MASTER'S PROGRAM) =17 LEVEL 3 (DOCTORAL PROGRAM) =18 DON'T KNOW = -8 REFUSED = -9	
104	How long have you lived in this area or community?	MONTHS ____=2 YEARS ____=3 I HAVE ALWAYS LIVED HERE = 3 DON'T KNOW = -8 REFUSED = -9	IF HAVE ALWAYS LIVED HERE → 107

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE ONE: RESPONDENT BACKGROUND (continued)			
105	Just before you moved here, did you live in an urban area or in a rural area?	CITY=1 TOWN=2 RURAL AREA=3 DON'T KNOW=-8 REFUSED=-9	
106	Before you moved here, which REGION did you live in? If you lived outside of Eswatini, which country did you live in?	HHOHHO = 1 UBOMBO = 2 MANZINI = 3 SHISELWENI = 4 SOUTH AFRICA = 5 MOZAMBIQUE = 6 ZIMBABWE = 7 LESOTHO = 8 OTHER COUNTRY (SPECIFY) =96 DON'T KNOW=-8 REFUSED =-9	IF OTHER → 107
107	Have you ever lived away from home for more than 1 month at a time?	YES=1 NO=2 DON'T KNOW=-8 REFUSED=-9	IF NO, DON'T KNOW, REFUSED → 112
108	When was the last time you lived away from home for over a month? Month Year	(VALUE LIST JANUARY - DECEMBER) DONT KNOW MONTH = -8 REFUSED MONTH= -9 [COMBO BOX RESPONSE] = 9999 DON'T KNOW YEAR = -8 REFUSED YEAR = -9	IF > 1 YEAR AGO → 110 IF DON'T KNOW, REFUSED MONTH /YEAR → 110
109	How many times have you been away from home for one or more months IN THE PAST YEAR?	[COMBO BOX RESPONSE] INTEGER: 0-12 DON'T KNOW=-8 REFUSED=-9	
110	The last time you were away from home for more than one month, where were you? If you were in more than one place while you were away, please give the place you spent the most time (INTERVIEWER: PROBE TO GET SPECIFIC INFORMATION.)	ANOTHER COMMUNITY IN THIS INKHUNDLA = 1 ANOTHER INKHUNDLA IN THIS REGION = 2 HHOHHO = 3 LUBOMBO = 4 MANZINI = 5 SHISELWENI = 6 SOUTH AFRICA = 7 MOZAMBIQUE = 8 ZIMBABWE = 9 LESOTHO = 10 OTHER (SPECIFY) =96 DON'T KNOW=-8 REFUSED =-9	IF OTHER → 111

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE ONE: RESPONDENT BACKGROUND (continued)			
111	What was the main reason you went there? (INTERVIEWER: SELECT FROM LIST.)	WORK=1 SCHOOL/UNIVERSITY=2 FAMILY/MARRIAGE=3 ACCESS HEALTH OR OTHER SERVICES=4 CONFLICT OR NATURAL DISASTER (FLOODS, CYCLONE, DROUGHT)=5 COVID-19 PARTIAL LOCKDOWN =6 OTHER (SPECIFY) =96 DON'T KNOW=-8 REFUSED=-9	IF NO, DON'T KNOW → 112
112	Have you done any work in the last 12 months for which you received cash or goods as payment? This includes work on the family farm or business for which you may not have been paid directly.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → SKIP TO NEXT MODULE
113	Have you done any work in the last seven days for which you received cash or goods as payment? This includes work on the family farm or business for which you may not have been paid directly.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
114	What is your occupation? That is, what kind of work do you mainly do?	MINING = 1 AGRICULTURE/FARMING = 2 TRANSPORT = 3 CONSTRUCTION = 4 UNIFORMED PERSONNEL = 5 INFORMAL TRADE = 6 GARMENT INDUSTRIES = 7 HOUSEKEEPER = 8 SEX WORKER = 9 STUDENT = 10 OTHER (SPECIFY) =96 DON'T KNOW=-8 REFUSED=-9	
115	Where do you normally work? In your home community, elsewhere in province/country, or outside the country?	HOME COMMUNITY=1 SAME COUNTRY, DIFFERENT COMMUNITY=2 OUTSIDE THE COUNTRY=3 DON'T KNOW=-8 REFUSED=-9	
MODULE 2: MARRIAGE			
Interviewer says: "Now I would like to ask you about your current and previous relationships and/or marriages."			
201	Have you ever been married or lived together with a [man/woman] as if married?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED SKIP TO NEXT MODULE: REPRO
202	How old were you the first time you married or started living with a [man/woman] as if married?	___ YEARS OLD DON'T KNOW = -8 REFUSED = -9	

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE 2: MARRIAGE (continued)			
203	What is your marital status now: are you married, living together with someone as if married, widowed, divorced, or separated/single?	MARRIED=1 LIVING TOGETHER=2 WIDOWED=3 DIVORCED=4 SEPARATED/SINGLE=5 DON'T KNOW=-8 REFUSED=-9	IF WIDOWED, DIVORCED, SEPARATED/ SINGLE, DON'T KNOW, REFUSED, SKIP TO NEXT MODULE: REPRO
Interviewer says: "The next several questions are about your current husband, wife or partner(s)."			
MARRIAGE GROUP FOR MEN			
204	Altogether, how many wives or live-in partners do you have who live with you here in this household?	NUMBER OF WIVES OR PARTNERS LIVING IN HOUSEHOLD____ DON'T KNOW=-8 REFUSED=-9	IF 204 = POSITIVE INTEGER (1-75) GO TO NEXT IF 204 = 0 OR ALTERNATIVE SKIP TO 206
205	Please enter the name(s) of your wife/partner that lives with you in this household. (INTERVIEWER: SWIPE FORWARD TO ENTER DON'T KNOW OR REFUSED)	_____ (REPEAT AS NECESSARY) NOT LISTED IN HOUSEHOLD DON'T KNOW=-8 REFUSED=-9	
206	How many wives or live-in partners do you have who live elsewhere? This would include wives or partners that you stay with or support in other households. INTERVIEWER: ENTER 0 FOR "NONE"	NUMBER OF WIVES/LIVE-IN PARTNERS____ DON'T KNOW=-8 REFUSED=-9	IF NONE, DON'T KNOW, REFUSED → 301
207	You mentioned that you have wife/wives who live elsewhere. Where are they?	STAYING IN A DIFFERENT HOUSEHOLD, SAME COMMUNITY=1 STAYING IN A DIFFERENT COMMUNITY, SAME REGION/DISTRICT=2 STAYING IN A DIFFERENT REGION/ DISTRICT=3 STAYING IN A DIFFERENT COUNTRY=4 DON'T KNOW=-8 REFUSED=-9	FOR ALL → 301
END: MARRIAGE GROUP FOR MEN			

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
START: MARRIAGE GROUP FOR WOMEN			
208	Is your husband or partner living with you now or is he staying elsewhere?	LIVING IN THE HOUSEHOLD=0 STAYING IN A DIFFERENT HOUSEHOLD, SAME COMMUNITY=1 STAYING IN A DIFFERENT COMMUNITY, SAME REGION/DISTRICT=2 STAYING IN A DIFFERENT REGION/DISTRICT=3 STAYING IN A DIFFERENT COUNTRY=4 DON'T KNOW=-8 REFUSED=-9	IF ANYTHING, OTHER THAN LIVING IN THE HOUSEHOLD → 211
209	Please select the husband/partner who lives with you (SEE LIST OF PERSONS ON HH ROSTER)	[LIST OF PERSONS ON HH ROSTER] NOT LISTED IN HOUSEHOLD=96 DON'T KNOW=-8 REFUSED=-9	IF NOT LISTED IN HOUSEHOLD → 211
210	Please enter the name of your husband/partner that lives with you.	_____ DON'T KNOW=-8 REFUSED=-9	
211	Does your husband or partner have other wives or does he live with other women as if married?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → 301
212	Including yourself, in total, how many wives or live-in partners does your husband or partner have?	NUMBER OF WIVES/LIVE-IN PARTNERS____ DON'T KNOW=-8 REFUSED=-9	
MODULE THREE: REPRODUCTION			
Interviewer says: "Now I would like to ask you questions about your pregnancies and your children."			
301	How many times have you had a pregnancy that resulted in a live birth? [A live birth is when the baby shows signs of life, such as breathing, beating of the heart or movement, even if the baby subsequently died.] [INTERVIEWER: CODE 0 IF NONE]	NUMBER OF LIVE BIRTHS ____ DON'T KNOW=-8 REFUSED=-9	IF 0, DON'T KNOW, REFUSED, SKIP 329 IF > 0 → 302
302	How many times have you had a pregnancy that resulted in a live birth since the 1st of January, 2018? [INTERVIEWER: CODE 0 IF NONE. TWINS/TRIPLETS ARE CONSIDERED ONE LIVE BIRTH IF BORN ALIVE]	NUMBER OF LIVE BIRTHS ____ DON'T KNOW=-8 REFUSED=-9	IF NUMBER OF LIVE BIRTHS = NONE, DON'T KNOW, OR REFUSED → 329 IF NUMBER OF LIVE BIRTHS > 0 → 303
Interviewer says: "Now I would like to ask you some questions about the last pregnancy that resulted in a live birth since the 1st of January 2018."			
303	Did your last pregnancy result in birth to twins or more?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → 305

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE THREE: REPRODUCTION (continued)			
START: REPEATING GROUP FOR MULTIPLE BABIES			
304	<p>What is the name of the [BIRTHORDER] born child from your last pregnancy that resulted in a live birth?</p> <p>(If the child was not named before death, input birth and the birth order number. FOR EXAMPLE, "BIRTH 1")</p> <p>Was there another multiple born alive</p>	<p>NAME _____</p> <p>YES=1 NO=2</p>	<p>IF 1 REPEAT 304</p> <p>IF NO → 306</p>
END: REPEATING GROUP FOR MULTIPLE BABIES			
305	<p>What is the name of the child from your last pregnancy that resulted in a live birth?</p> <p>A live birth is when the baby shows signs of life, such as breathing, beating of the heart or movement, even if the baby subsequently died.</p> <p>(IF THE CHILD WAS NOT NAMED BEFORE DEATH, INPUT "BIRTH 1")</p>	NAME _____	
306	<p>During your last pregnancy with [CHILD NAME], did you visit a health facility for antenatal care?</p>	<p>YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9</p>	<p>IF DON'T KNOW, REFUSED → 314</p>
Interviewer says: "I will now be asking you questions on HIV testing. Please remember that your responses will be kept confidential and will not be shared with anyone else."			
307	<p>Have you ever tested for HIV before your pregnancy with [CHILD NAME]?</p>	<p>YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9</p>	<p>IF NO, DON'T KNOW, REFUSED → 310</p>
308	<p>Did you test positive for HIV before your pregnancy with [CHILD NAME]?</p>	<p>YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9</p>	<p>IF NO, DON'T KNOW, REFUSED → 310</p>
309	<p>At the time of your first antenatal care visit when you were last pregnant with [CHILD NAME], were you already taking ARVs, that is, antiretroviral medications to treat HIV?</p>	<p>YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9</p>	<p>IF YES → 316</p> <p>IF NO, DON'T KNOW, REFUSED → 312</p>
310	<p>Were you tested for HIV anytime during pregnancy or delivery with [CHILD NAME]?</p>	<p>YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9</p>	<p>IF NO, DON'T KNOW, REFUSED → 314</p>

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE THREE: REPRODUCTION (continued)			
311	What was the result of your last HIV test during your last pregnancy with [CHILD NAME]?	POSITIVE=1 NEGATIVE=2 INCONCLUSIVE=3 DID NOT RECEIVE RESULTS=4 DON'T KNOW=-8 REFUSED=-9	IF NEGATIVE, INCONCLUSIVE, DID NOT RECEIVE RESULTS, DON'T KNOW, REFUSED → 314
312	Did you take ARVs at any time during your last pregnancy with [CHILD NAME] to prevent the child from getting HIV?	YES = 1 NO = 2 DON'T KNOW =-8 REFUSED =-9	IF NO, DON'T KNOW, REFUSED → 316
313	What was the main reason you did not take ARVs while you were pregnant with [CHILD NAME]?	WAS NOT PRESCRIBED=1 I FELT HEALTHY/NOT SICK=2 COST OF MEDICATIONS=3 COST OF TRANSPORT=4 RELIGIOUS REASONS=5 WAS TAKING TRADITIONAL MEDICATIONS=6 MEDICATIONS OUT OF STOCK=7 DID NOT WANT PEOPLE TO KNOW HIV STATUS=8 DID NOT RECEIVE PERMISSION FROM SPOUSE/FAMILY=9 COVID-19 PANDEMIC (CORONA)=10 OTHER (SPECIFY)=96 DON'T KNOW=-8 REFUSED=-9	IF OTHER → 316
314	Were you tested for HIV at any time after delivery of your last pregnancy with [CHILD NAME]?	YES = 1 NO = 2 DON'T KNOW =-8 REFUSED =-9	IF NO, DON'T KNOW, REFUSED → 316
	For example, were you tested while you were breastfeeding or after your completed breastfeeding?		
315	What was the result of the HIV test that you received after delivery of your last pregnancy with [CHILD NAME]?	POSITIVE=1 NEGATIVE=2 UNKNOWN/INCONCLUSIVE=3 DID NOT RECEIVE RESULTS=4 DON'T KNOW=-8 REFUSED=-9	
316	When did you give birth to [CHILD NAME]? Please give your best guess.	[VALUE LIST: 1:31]	
	Day	DAYS ___ DON'T KNOW DAY=-8 REFUSED DAY=-9	
	Month	MONTHS___ DON'T KNOW MONTH=-8 REFUSED MONTH=-9	
	Year	YEARS___ DON'T KNOW YEAR=-8 REFUSED YEAR=-9	

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE THREE: REPRODUCTION (continued)			
START: BABIES OF LAST PREGNANCY			
317	What is/was the sex of [CHILD NAME]?	MALE = 1 FEMALE = 2 DON'T KNOW = -8 REFUSED = -9	IF NOT MALE → 321
318	Was [CHILD NAME] circumcised?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF YES, DON'T KNOW, REFUSED → 321
319	Why was [CHILD NAME] not circumcised?	COST IS TOO MUCH =1 DON'T KNOW WHERE TO GET IT DONE= 2 AFRAID OF THE PAIN CHILD WOULD EXPERIENCE =3 BAD EXPERIENCE WITH MC= 4 FAMILY REFUSED = 5 NOT CULTURALLY APPROPRIATE =6 NO ONE OFFERED =7 CHILD WAS ILL AT BIRTH =8 OTHER (SPECIFY) =96 DON'T KNOW=-8 REFUSED=-9	
320	At what age was [CHILD NAME] circumcised? (INTERVIEWER: ONLY ONE OPTION MAY BE SELECTED. FOR EXAMPLE, ANSWER ONLY IN MONTHS OR IN YEARS. CODE '0' IF LESS THAN 1 MONTH.)	___ MONTH = 2 ___ YEAR = 3	
321	Is [CHILD NAME] still alive?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF YES, DON'T KNOW, REFUSED → 324
322	How old was [CHILD NAME] in years when he/she died? INTERVIEWER: KEY '0' IF CHILD WAS LESS THAN ONE MONTH OLD	___ YEARS OLD DON'T KNOW=-8 REFUSED=-9	IF >0, DON'T KNOW, REFUSED → 324 IF =0 →323
323	How old was [CHILD NAME] in months when he/she died? INTERVIEWER: KEY '0' IF CHILD WAS LESS THAN ONE MONTH OLD	___ MONTHS OLD DON'T KNOW=-8 REFUSED=-9	IF >0 → 324
324	Did you ever breastfeed [CHILD NAME]?	YES=1 NO, NEVER BREASTFEED=2 NO, CHILD DIED BEFORE BREASTFEEDING=3 DON'T KNOW=-8 REFUSED=-9	IF NO, NEVER BREASTFEED; NO, CHILD DIED BEFORE BREASTFEEDING; DON'T KNOW; REFUSED → 326

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE THREE: REPRODUCTION (continued)			
325	Are you still breastfeeding [CHILD NAME]?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	DISPLAY ONLY IF 321 = YES, DON'T KNOW, REFUSED
326	After [CHILD NAME] was born, was he/she tested for HIV?	YES=1 NO, NOT TESTED FOR HIV=2 NO, CHILD DIED BEFORE TESTING=3 DON'T KNOW=-8 REFUSED=-9	IF NO, NOT TESTED FOR HIV; NO, CHILD DIED BEFORE TESTING; DON'T KNOW, REFUSED → 332
327	How old was [CHILD NAME] when he/she first tested for HIV? (INTERVIEWER: ONLY ONE OPTION MAY BE SELECTED. FOR EXAMPLE, ANSWER ONLY IN WEEKS, MONTHS OR IN YEARS. CODE '0' IF LESS THAN 1 WEEK) (SWIPE FORWARD TO ENTER DON'T KNOW OR REFUSED.)	LESS THAN 1 WEEK=0 WEEKS ___ = 1 MONTHS ___ = 2 YEARS ___ = 3 DON'T KNOW = 8 REFUSED = 9	DISPLAY IF MONTHS AND YEARS = "NULL"
328	What was the result of [CHILD NAME]'s first HIV test?	POSITIVE; CHILD HAS HIV=1 NEGATIVE; CHILD DOES NOT HAVE HIV=2 UNKNOWN/INCONCLUSIVE=3 DID NOT RECEIVE RESULTS=4 DON'T KNOW=-8 REFUSED=-9	
329	Was [CHILD NAME] tested for HIV after you stopped breastfeeding?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF 324 = NO, NEVER BREASTFEED; NO, CHILD DIED BEFORE BREASTFEEDING; DON'T KNOW; REFUSED SKIP IF 325 = YES
330	How old was [CHILD NAME] when he/she last tested for HIV? (INTERVIEWER: ONLY ONE OPTION MAY BE SELECTED. FOR EXAMPLE, ANSWER ONLY IN WEEKS, MONTHS OR IN YEARS. CODE '0' IF LESS THAN 1 WEEK. (SWIPE FORWARD IF CHILD TESTED ONLY ONCE FOR HIV, DON'T KNOW, OR REFUSED.)	LESS THAN 1 WEEK=0 WEEKS ___ = 1 MONTHS ___ = 2 YEARS ___ = 3 CHILD ONLY TESTED ONCE FOR HIV (FIRST TEST IS THE SAME AS LAST TEST)=4 DON'T KNOW=-8 REFUSED=-9	ALL RESPONSES → 332
331	What was the result of [CHILD NAME]'s most recent HIV test?	POSITIVE; CHILD HAS HIV=1 NEGATIVE; CHILD DOES NOT HAVE HIV=2 UNKNOWN/INCONCLUSIVE=3 DID NOT RECEIVE RESULTS=4 DON'T KNOW=-8 REFUSED=-9	SKIP IF 328 = POSITIVE; CHILD HAS HIV
332	Interviewer says: "Thank you for the information regarding [CHILD NAME]."		IF 321 = YES, RETURN TO 321 FOR EACH VALUE OF 304

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE THREE: REPRODUCTION (continued)			
END: BABIES OF LAST PREGNANCY			
Interviewer says: "I will now ask about current pregnancies."			
333	Are you pregnant now?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = -9	IF YES → END OF MODULE
Interviewer says: "I will now ask you about family planning."			
334	Are you or your partner currently doing something or using any method to delay or avoid getting pregnant?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → END OF MODULE
335	Which method are you or your partner using? (INTERVIEWER: SELECT ALL THAT APPLY.)	FEMALE STERILIZATION=A MALE STERILIZATION=B PILL=C IUD/"COIL"=D INJECTIONS=E IMPLANT=F CONDOM=G FEMALE CONDOM=H RHYTHM/NATURAL METHODS/CYCLE=I BEADS/STANDARD DAYS/WITHDRAWAL=J NOT HAVING SEX=K OTHER (SPECIFY) =X DON'T KNOW=Y REFUSED=Z	
MODULE FOUR: MALE CIRCUMCISION (SKIP IF FEMALE)			
Interviewer says: "I will be asking a few questions about circumcision. Circumcision is the complete removal of the foreskin from the penis." If you feel comfortable, I can show you a picture of an uncircumcised penis, a partially circumcised penis and a completely circumcised penis."			
401	Some men are uncomfortable talking about circumcision, but it is important for us to have this information. Some men are circumcised. Are you circumcised?	YES =1 NOT = 3 DON'T KNOW=-8 REFUSED=-9	IF YES SKIP 403 IF DON'T KNOW, REFUSED → END OF MODULE
402	Are you planning to get circumcised within the next 6 months?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF YES, NO, DON'T KNOW, REFUSED → END OF MODULE
Interviewer says: "Some men are circumcised by a medical provider such as a doctor, clinical officer, nurse, or midwife. Some men are circumcised by a traditional practitioner. Some men are circumcised by both a medical provider and a traditional practitioner."			
403	Were you circumcised by a medical provider?	YES=1 NO=2 DON'T KNOW=-8 REFUSED=-9	
404	Were you circumcised by a medical provider? [By health care provider, I mean a doctor, clinical officer, nurse or midwife.]	YES=1 NO=2 DON'T KNOW=-8 REFUSED=-9	IF NO, DON'T KNOW, REFUSED → END OF MODULE

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE FOUR: MALE CIRCUMCISION (SKIP IF FEMALE) (continued)			
405	How old were you when you were circumcised? Please give your best guess. (INTERVIEWER: IF LESS THAN ONE YEAR, CODE '0'.)	____ YEARS OLD DON'T KNOW=-8 REFUSED=-9	IF 0 → END OF MODULE
MODULE FIVE: SEXUAL ACTIVITY			
Interviewer says: "In this part of the interview, I will be asking about your sexual relationships and practices. These questions will help us better understand how they may affect your life and risk for HIV. Sex is when a penis enters a vagina or the anus."			
"Remember that your answers are completely confidential and will not be shared with anyone. If there are questions that you do not want to answer, we can go to the next question."			
501	How old were you when you had sex for the very first time? If they are unsure, confirm if they have had vaginal sex. If they said an age less than 12 years: Confirm age at first sex. Are you sure this is what the participant said?	AGE AT FIRST SEX ____ NEVER HAD SEX=-96 DON'T KNOW=-8 REFUSED=-9 YES=1 NO=2	IF NEVER HAD SEX → NEXT MODULE
502	People often have sex with different people over their lifetime. In total, with how many different people have you had sex in your lifetime? Please give your best guess.	NUMBER OF PEOPLE ____ DON'T KNOW=-8 REFUSED=-9	
503	How many different people have you had sex with in the last 12 months? (If none, code '0'. If number of partners is greater than 100, enter '100'.)	NUMBER OF PEOPLE ____ DON'T KNOW=-8 REFUSED=-9	IF 0, DON'T KNOW, REFUSED → NEXT MODULE
START: PARTNERS OF LAST 12 MONTHS			
(ASK ONLY ABOUT THE LAST 3 PERSONS THE PARTICIPANT HAS HAD SEX WITH IN THE PAST 12 MONTHS).			
IF 503> 2, REPEAT ON START = 3, REPEAT ON			
Interviewer says: "Now I would like to ask you some questions about the people you have had sex with in the last 12 months. Let me assure you again that your answers are completely confidential and will not be told to anyone. I will first ask you about the most recent person you had sex with."			
504	Is the person that you had sex with a spouse or a partner who lives in this household?	YES = 1 NO = 2	IF NO → 506
505	Please select the name below from the household membership list. Please identify the person you had sex with.	HOUSEHOLD QUESTIONNAIRE LINE NO. ____ NOT LISTED IN HOUSEHOLD=96	
506	I would like to ask you for the initials of this person so I can keep track [INITIALS]. They do not have to be the actual initials of this person. Is [INITIALS] the most recent person you had sex with?	[INITIALS] _____ YES = 1 NO = 2	DISPLAY IF [FIRST REPORTED PARTNER] (I.E. QUESTION TO ONLY APPEAR FOR FIRST ENTERED PARTNER.)

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE FIVE: SEXUAL ACTIVITY (continued)			
507	What is your relationship with [INITIALS]?	HUSBAND/WIFE=1 LIVE-IN PARTNER=2 PARTNER, NOT LIVE-IN=3 EX-SPOUSE/EX-PARTNER=4 FRIEND/ACQUAINTANCE=5 SEX WORKER=6 SEX WORKER CLIENT=7 STRANGER=8 OTHER (SPECIFY) =96 DON'T KNOW=-8 REFUSED=-9	
508	Is [INITIALS] male or female?	MALE=1 FEMALE=2 DON'T KNOW=-8 REFUSED=-9	
509	How old is [INITIALS]? Please give your best guess.	____ YEARS OLD DON'T KNOW=-8 REFUSED=-9	
510	The last time you had sex with [INITIALS], was a condom used?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
511	The last time you had sex with [INITIALS], did either of you drink alcohol beforehand?	ONLY I WAS DRINKING=1 ONLY PARTNER WAS DRINKING=2 BOTH WERE DRINKING=3 NEITHER=4 DON'T KNOW=-8 REFUSED=-9	
512	Does [INITIALS] know your HIV status? HIV status could mean you are HIV negative or HIV positive.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
513	What is the HIV status of [INITIALS]? (INTERVIEWER: Read responses aloud).	HE/SHE IS POSITIVE (DID NOT TEST TOGETHER)=1 HE/SHE IS POSITIVE, TESTED TOGETHER=2 HE/SHE IS NEGATIVE (DID NOT TEST TOGETHER)=3 HE/SHE IS NEGATIVE, TESTED TOGETHER=4 DON'T KNOW STATUS=-8 REFUSED=-9	
514	Interviewer says: "I will now ask you about the person you have had sex with previous to [INITIALS]."		SKIP IF 503 <= 1 IF 503 > 1 → 504 SKIP IF FINAL LOOP
END: PARTNERS OF LAST 12 MONTHS			

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE SIX: HIV TESTING			
Interviewer says: "I would like to ask you some questions about HIV testing."			
601	Have you seen a healthcare provider in a health facility in the last 12 months?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → 603
602	During any of your visits to the health facility in the last 12 months, did a healthcare provider offer you an HIV test?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
603	Have you ever tested for HIV?	YES =1 NO =2 DON'T KNOW = -8 REFUSED = -9	IF YES → 604 IF DON'T KNOW, REFUSED → 611
604	Why have you never been tested for HIV? (INTERVIEWER: SELECT ALL THAT APPLY. PROMPT FOR ANY MORE REASONS.)	DON'T KNOW WHERE TO TEST=A TEST COSTS TOO MUCH=B TRANSPORT COSTS TOO MUCH=C TOO FAR AWAY=D AFRAID OTHERS WILL KNOW ABOUT TEST RESULTS=E DON'T NEED TEST/LOW RISK=F DID NOT RECEIVE PERMISSION FROM SPOUSE/FAMILY=G AFRAID SPOUSE/PARTNER/FAMILY WILL KNOW RESULTS=H DON'T WANT TO KNOW I HAVE HIV=I CANNOT GET TREATMENT FOR HIV=J TEST KITS NOT AVAILABLE=K RELIGIOUS REASONS=L COVID-19 PARTIAL LOCKDOWN=M OTHER (SPECIFY) =X _____ DON'T KNOW=-Y REFUSED=-Z	IF ANYTHING OTHER THAN K → 611
605	When was your last HIV test? Please give month and year if you can. Month Year	(VALUE LIST: JANUARY - DECEMBER) MONTHS _____ DON'T KNOW MONTH=-8 REFUSED MONTH=-9 YEARS _____ DON'T KNOW YEAR=-8 REFUSED YEAR=-9	
606	Where was your last HIV test done?	VCT FACILITY=1 MOBILE VCT=2 AT HOME=3 HEALTH CLINIC/FACILITY=4 HOSPITAL OUTPATIENT CLINIC=5 TB CLINIC=6 STI CLINIC=7 HOSPITAL INPATIENT WARDS=8 BLOOD DONATING CENTER=9 ANC CLINIC=10 VMMC CLINIC=11 OTHER (SPECIFY) =96 _____ DON'T KNOW=-8 REFUSED=-9	

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE SIX: HIV TESTING (continued)			
607	When you last tested for HIV, what was the main reason you tested?	<p>WAS OFFERED TEST BY HEALTH CARE OR OUTREACH WORKER=1 WANTED TO KNOW MY HIV STATUS=2 FELT AT RISK=3 FELT SICK=4 NEW PARTNER=5 PREGNANCY=6 MY PARTNER TESTED POSITIVE=7 PRE-MARITAL=8 OTHER (SPECIFY) =96</p> <hr/> DON'T KNOW=-8 REFUSED=-9	
608	What was the result of your last HIV test?	POSITIVE=1 NEGATIVE=2 UNKNOWN/INCONCLUSIVE=3 DID NOT RECEIVE RESULTS=4 DON'T KNOW=-8 REFUSED=-9	IF NEGATIVE, UNKNOWN/ INCONCLUSIVE, DID NOT RECEIVE RESULTS, DON'T KNOW, REFUSED → 611
609	<p>When was your first positive HIV test? Please give month and year.</p> <p>This will be the very first HIV-positive test result that you have received. This will be the first time a health care provider told you that you had HIV.</p> <p>(INTERVIEWER: Probe to verify date. Suggest that they can look at treatment card if available.)</p> <p>Month</p> <p>Year</p>	<p>[VALUE LIST: JANUARY - DECEMBER]</p> <p>MONTH _____ DON'T KNOW MONTH=-8 REFUSED MONTH=-9</p> <p>YEAR _____ DON'T KNOW YEAR=-8 REFUSED YEAR=-9</p>	
610	<p>When was your last negative HIV test? This would be your last negative before you tested positive. Please give month and year.</p> <p>(INTERVIEWER: Swipe forward if no previous HIV test.)</p> <p>Month</p> <p>Year</p>	<p>NO PREVIOUS HIV NEGATIVE TEST BEFORE THE POSITIVE TEST=3</p> <p>MONTH _____ DON'T KNOW MONTH=-8 REFUSED MONTH=-9</p> <p>YEAR _____ DON'T KNOW YEAR=-8 REFUSED YEAR=-9</p>	<p>ASK ONLY TO THOSE WHO SELF-REPORTED HIV POSITIVE (IF 608=YES OR 308=YES OR 311=POSITIVE OR 315=POSITIVE)</p>

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE SIX: HIV TESTING (continued)			
611	Has a healthcare provider ever told you that you have HIV?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF → 308 = POSITIVE OR 311=POSITIVE OR 315=POSITIVE OR 608=POSITIVE IF NO, DON'T KNOW, REFUSED, SKIP 613
612	When did a healthcare provider first tell you that you have HIV? Month Year	[VALUE LIST: JANUARY - DECEMBER] MONTH _____ DON'T KNOW MONTH=-8 REFUSED MONTH=-9 YEAR _____ DON'T KNOW YEAR=-8 REFUSED YEAR=-9	DISPLAY IF 611=YES OR TOLD IF HIV+ POS
Interviewer says: "There are now HIV tests that you can do yourself at home. Some of these self-test kits allow you to test yourself for HIV by swabbing your mouth or pricking your finger and testing the fluid for HIV."			
613	Have you heard of self-testing?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → 618
614	Where did you get the HIV self-test kit	HEALTH FACILITY = 1 PHARMACY = 2 COMMUNITY BASED ORGANIZATIONS = 3 FAITH BASED ORGANIZATION =4 SEXUAL PARTNER = 5 FAMILY MEMBER = 6 OTHER (SPECIFY) 96 DON'T KNOW = -8 REFUSED = -9	
615	Was the test self-administered or assisted?	SELF-ADMINISTERED = 1 ASSISTED = 2 DON'T KNOW = -8 REFUSED = -9	
616	Did you visit the health facility for retesting to confirm your HIV status?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
617	Of the following people, who have you told that you are HIV positive? (Read the list out loud. Select all that apply.)	NO ONE=A SPOUSE/SEX PARTNER=B HEALTH CARE PROVIDER = F FRIEND=D FAMILY MEMBER=E OTHER (SPECIFY)=X DON'T KNOW=Y REFUSED=Z	SHOW SCREEN IF INDIVIDUAL HAS SAID TESTED POSITIVE (IF 308=YES OR 311=POSITIVE OR 315=POSITIVE OR 611=YES)
Interviewer says: "PrEP' or pre-exposure prophylaxis, involves taking a daily pill to reduce of getting HIV."			

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE SIX: HIV TESTING (continued)			
618	Have you ever heard of PrEP before now?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → 621
619	Have you ever taken PrEP?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → 621
620	Are you currently taking PrEP?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	APPLY IF NEVER TESTED OR SELF-REPORTED NEGATIVE: (IF 308 <> 1 AND 311 <> 1 AND 315 <> 1 AND 608 <> 1 AND 611 <> 1) IF YES, NO, DON'T KNOW, REFUSED → END OF MODULE
621	Would you take PrEP to help prevent HIV	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	APPLY IF NEVER TESTED OR SELF-REPORTED NEGATIVE: (IF 308 <> 1 AND 311 <> 1 AND 315 <> 1 AND 608 <> 1 AND 611 <> 1)
MODULE SEVEN: HIV STATUS, CARE AND TREATMENT			
Interviewer says: "Now I am going to ask you more about your experience with HIV care and treatment."			
701	After learning you had HIV, have you ever received care or treatment for HIV from a Healthcare Provider?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF YES → 703 IF DON'T KNOW, REFUSED → 709
702	What is the main reason why you have never received care or treatment for HIV from a Healthcare Provider?	FACILITY IS TOO FAR AWAY=1 I DON'T KNOW WHERE TO GET HIV MEDICAL CARE=2 COST OF CARE=3 COST OF TRANSPORT=4 I DO NOT NEED IT/FEEL HEALTHY/NOT SICK=5 I FEAR PEOPLE WILL KNOW THAT I HAVE HIV IF I GO TO A CLINIC=6 RELIGIOUS REASONS=7 I'M TAKING TRADITIONAL MEDICINE=8 DO NOT TRUST THE STAFF/QUALITY OF CARE=9 COVID-19 PARTIAL LOCKDOWN=10 OTHER (SPECIFY) =96 DON'T KNOW=-8 REFUSED=-9	IF OTHER → 709
703	Are you currently receiving HIV care from a health facility?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → 706

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE SEVEN: HIV STATUS, CARE AND TREATMENT (continued)			
704	At which facility are you currently receiving HIV care? (Select region.) (Select facility.) INTERVIEWER: IF FACILITY INFORMATION IS AVAILABLE, PLEASE KEY. OTHERWISE SWIPE FORWARD TO CONTINUE	[LIST OF FACILITY DISTRICTS] SOUTH AFRICA = 91 REGION NOT ON LIST=99 [LIST OF FACILITIES] CLINIC IN SOUTH AFRICA = 91 FACILITY NOT ON LIST=99 OTHER PLEASE SPECIFY	DISPLAY IF 703=YES IF NOT ON LIST, SKIP 705
705	In the past year, did you change the clinic where you receive HIV care?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
706	At your last HIV care visit, approximately how long did it take you to travel from your home (or workplace) one-way?	LESS THAN HALF HOUR=1 HALF HOUR TO ONE HOUR=2 ONE TO TWO HOURS=3 MORE THAN TWO HOURS=4 DON'T KNOW=-8 REFUSED=-9	
707	Does travel time to health facility make it difficult for you to access care?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
708	When did you last see a health care provider for HIV treatment or care? Month Year	(VALUE LIST: JANUARY - DECEMBER) DON'T KNOW MONTH=-8 REFUSED MONTH=-9 DON'T KNOW YEAR=-8 REFUSED YEAR=-9	
709	Have you ever taken ARVs, that is, antiretroviral medications to treat HIV infection?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF YES → 711 IF NO, DON'T KNOW → 723
710	What is the main reason you have never taken ARVs?	NOT ELIGIBLE FOR TREATMENT=1 HEALTH CARE PROVIDER DID NOT PRESCRIBE=2 HIV MEDICINES ARE NOT AVAILABLE=3 I FEEL HEALTHY/NOT SICK=4 COST OF CARE=5 RELIGIOUS REASONS=6 TAKING TRADITIONAL MEDICATIONS=7 NOT ATTENDING HIV CLINIC=8 CLINIC IS TOO FAR=9 COVID-19 PANDEMIC (CORONA)=10 OTHER (SPECIFY) =96 DON'T KNOW=-8 REFUSED=-9	

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE SEVEN: HIV STATUS, CARE AND TREATMENT (continued)			
711	What month and year did you first start taking ARVs? (Probe to verify date.)	MONTH _____ DON'T KNOW MONTH=-8 REFUSED MONTH=-9	
	Month		
	Year	YEAR _____ DON'T KNOW YEAR=-8 REFUSED YEAR=-9	
712	Are you currently taking ARVs, that is, antiretroviral medications? By currently, I mean that you may have missed some doses but you are still taking ARVs.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF YES → 714 IF DON'T KNOW, REFUSED → 712
713	Can you tell me the main reason you stopped taking ARVs?	I HAD TROUBLE TAKING A TABLET EVERYDAY=1 I HAD SIDE EFFECTS=2 FACILITY TOO FAR AWAY FOR ME TO GET MEDICINE REGULARLY=3 COST OF CARE=4 I FEEL HEALTHY/SICK=5 FACILITY WAS OUT OF STOCK=6 RELIGIOUS REASONS=7 TAKING TRADITIONAL MEDICATIONS=8 OTHER (SPECIFY) =96 _____ DON'T KNOW=-8 REFUSED=-9	
714	How do you normally receive your ARVs? (INTERVIEWER: Read each response. Select the most common method of collection.)	PICK UP AT THE LOCAL CLINIC=1 PICK UP AT THE HOSPITAL=2 FROM THE COMMUNITY SUPPORT GROUP/ ADHERENCE CLUB=3 THEY ARE DELIVERED TO MY HOME=4 A FAMILY MEMBER/FRIEND COLLECTS THEM=5 PRIVATE PHARMACY = 6 DON'T KNOW=-8 REFUSED=-9	IF FROM THE COMMUNITY SUPPORT GROUP/ ADHERENCE CLUB, DON'T KNOW, REFUSED → 716
715	Since March 2020, the CORONA pandemic has affected many medical services including HIV testing and HIV care and treatment. Was there any period since March 2020 when you obtained (or were told to obtain) your ARV in a different way or place than where you usually receive them?	YES=1 NO=2 DON'T KNOW=-8 REFUSED=-9	

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE SEVEN: HIV STATUS, CARE AND TREATMENT (continued)			
716	<p>The last time you picked up or received your ARVs, how much supply were you given? You should include both your prescription and any extra you were given.</p> <p>(INTERVIEWER: Use weeks if less than one month. Swipe forward to enter DON'T KNOW or REFUSED.)</p> <p>Number of Weeks or Months of Supply Units</p>	<p>_____ WEEKS=1 _____ MONTHS=2 DON'T KNOW=-8 REFUSED=-9</p>	
717	<p>The last time you picked up or received your ART, were you told that you were being given a longer refill because of the COVID-19 partial lockdown?</p>	<p>YES=1 NO=2 DON'T KNOW=-8 REFUSED=-9</p>	
718	<p>Have your ARVs ever been changed or modified?</p>	<p>YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9</p>	<p>IF NO, DON'T KNOW, REFUSED → 720</p>
719	<p>Why were your ARVs changed?</p>	<p>I WAS NOT RESPONDING TO MY FIRST TREATMENT=1 MY VIRAL LOAD WASN'T SUPPRESSED=2 I WANTED TO GET PREGNANT OR WAS PREGNANT=3 I WAS HAVING/WORRIED ABOUT SERIOUS SIDE EFFECTS=4 NATIONAL ART REGIMAN CHANGE = 5</p> <p>OTHER (SPECIFY) =96</p> <p>_____</p> <p>DON'T KNOW=-8 REFUSED=-9</p>	<p>IF ANYTHING BUT OTHER → 720</p>
720	<p>You said before that you had been away from home during the past year. At any point in the past year were you away from home, was there any period when you interrupted your ARV treatment?</p>	<p>YES=1 NO=2 DON'T KNOW=-8 REFUSED=-9</p>	<p>ONLY ASK IF 109 >= 1</p>
721	<p>Since March 2020, the COVID-19 pandemic has affected many medical services including HIV testing and HIV care and ART clinics. Was there any period since March 2020 when your ART due to the COVID-19 partial lockdown?</p>	<p>YES=1 NO=2 DON'T KNOW=-8 REFUSED=-9</p>	
722	<p>People sometimes forget to take all of their ARVs every day. In the last 30 days, how many days have you missed taking any of your ARV pills?</p> <p>(INTERVIEWER: ENTER '0' if NONE.)</p>	<p>NUMBER OF DAYS _____ DON'T KNOW=-8 REFUSED=-9</p>	

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE SEVEN: HIV STATUS, CARE AND TREATMENT (continued)			
723	Did you ever have a viral load test? This is a test that measure how much HIV is in your blood.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → 726
724	When did you last have a viral load test? Month Year	MONTH _____ DON'T KNOW MONTH=-8 REFUSED MONTH=-9 YEAR _____ DON'T KNOW YEAR=-8 REFUSED YEAR=-9	
725	Did you receive the results of your last viral load test?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
726	At your last HIV medical care visit, were you asked if you had any of the following tuberculosis or TB symptoms: (INTERVIEWER: Read all responses aloud. Select all that apply.)	PERSISTENT COUGH=A FEVER=B NIGHT SWEATS=C WEIGHT LOSS=D NONE OF THE ABOVE=E DON'T KNOW=Y REFUSED=Z	
727	Have you ever taken medicine or a pill to prevent you from coming down with TB? This is sometimes known as TB Preventative Therapy or TPT. An example of TPT is Isoniazid, IPT or INH, which is medication that prevents TB. It is given to people with HIV or people who are in contact with someone with TB. It is not treatment for TB.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → 801
728	Are you currently taking TPT? By currently, I mean that you may have missed some doses but you are still taking TPT.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → 801
729	How many months have you taken TPT?	MONTHS _____ DON'T KNOW=-8 REFUSED=-9	

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE EIGHT: TUBERCULOSIS			
Interviewer says: "Now we will ask you about tuberculosis or TB."			
801	In the last 12 months, did you visit a clinic for TB diagnosis or treatment?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED AND MALE → 812 IF NO, DON'T KNOW, REFUSED AND FEMALE=2 → 807
802	When you visited a TB clinic in the last 12 months, were you tested for HIV?	YES=1 NO, WAS NOT TESTED FOR HIV=2 NO, ALREADY KNOW I AM HIV POSITIVE=3 DON'T KNOW=-8 REFUSED=-9	
803	In the last 12 months, were you told by a Healthcare provider, that you had TB?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED AND MALE → 812 IF NO, DON'T KNOW, REFUSED AND FEMALE=2 → 807
804	In the last 12 months, were you treated for TB?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED AND MALE → 812 IF NO, DON'T KNOW, REFUSED AND FEMALE=2 → 807
805	Are you currently on treatment for TB?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED AND MALE → 812 IF NO, DON'T KNOW, REFUSED AND FEMALE=2 → 807
806	The last time you were treated for TB, did you complete at least 6 months of treatment?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF MALE → 813
Interviewer says: "Now I am going to ask you about tests a health care provider can do to check for cervical cancer. The cervix connects the uterus to the vagina. The tests a healthcare provider can do to check for cervical cancer are called a Pap smear, HIV test and VIA test."			SKIP IF MALE
For a Pap smear and HPV test, a health care provider puts a small stick inside the vagina to wipe the cervix and sends the sample to the laboratory. For a VIA test, a healthcare worker puts vinegar on the cervix and looks to see if the cervix changes color.			
807	Have you ever been tested for cervical cancer?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → 813

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE EIGHT: TUBERCULOSIS (continued)			
808	What month and year was your last test for cervical cancer?	MONTH_____	
	Month	DON'T KNOW MONTH=-8 REFUSED MONTH=-9	
	Year	YEAR_____	
		DON'T KNOW YEAR=-8 REFUSED YEAR=-9	
809	What was the result of your last test for cervical cancer?	NORMAL/NEGATIVE=1 ABNORMAL/POSITIVE=2 SUSPECT CANCER=3 UNCLEAR/INCONCLUSIVE=4 DID NOT RECEIVE RESULTS=5 DON'T KNOW=-8 REFUSED=-9	IF NORMAL/NEGATIVE, DON'T KNOW, REFUSED → 811
810	Did you receive treatment after your last test for cervical cancer? Did you receive treatment on the same day or on a different day?	YES, I WAS TREATED ON THE SAME DAY=1 YES, I RECEIVED TREATMENT ON A DIFFERENT DAY=2 NO=3 DON'T KNOW=-8 REFUSED=-9	
811	Have you ever been vaccinated to prevent cervical cancer? This would be the HPV vaccine.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
Interviewer says: "I am now going to ask you about other aspects of health."			
812	Over the past two weeks, how often have you been bothered by having little interest in doing things?	NOT AT ALL=1 1-7 DAYS=2 8-11 DAYS=-3 12-14 DAYS=-4 DON'T KNOW=-8 REFUSED=-9	
813	Over the past two weeks, how often have you felt down, depressed or hopeless?	NOT AT ALL=1 1-7 DAYS=2 8-11 DAYS=-3 12-14 DAYS=-4 DON'T KNOW=-8 REFUSED=-9	
814	Over the past two weeks, how often have you felt nervous, anxious or on edge?	NOT AT ALL=1 1-7 DAYS=2 8-11 DAYS=-3 12-14 DAYS=-4 DON'T KNOW=-8 REFUSED=-9	
815	Over the past two weeks, how often have you not been able to stop or control worrying?	NOT AT ALL=1 1-7 DAYS=2 8-11 DAYS=-3 12-14 DAYS=-4 DON'T KNOW=-8 REFUSED=-9	

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE EIGHT: TUBERCULOSIS (continued)			
816	Have you ever been told by a Health care provider that you have any of the following chronic health conditions? (INTERVIEWER: Select all that apply.)	HIGH BLOOD SUGAR OR DIABETES=A HIGH BLOOD PRESSURE OR HYPERTENSION=B HEART DISEASE OR CHRONIC HEART CONDITION=C KIDNEY DISEASE=D CANCER OR TUMOR=E LUNG DISEASE OR CHRONIC LUNG DISEASE=F DEPRESSION OR MENTAL HEALTH CONDITION=G NONE OF THE ABOVE=I OTHER (SPECIFY) =96 DON'T KNOW=Y REFUSED=Z	
817	Are you currently taking medication for any of the following chronic health conditions? (INTERVIEWER: If any of the conditions in the previous question are selected, respondent should be asked about treatment for that condition.)	HIGH BLOOD SUGAR OR DIABETES=A HIGH BLOOD PRESSURE OR HYPERTENSION=B HEART DISEASE OR CHRONIC HEART CONDITION=C KIDNEY DISEASE=D CANCER OR TUMOR=E LUNG DISEASE OR CHRONIC LUNG DISEASE=F DEPRESSION OR MENTAL HEALTH CONDITION=G NONE OF THE ABOVE=I OTHER (SPECIFY) =96 DON'T KNOW=Y REFUSED=Z	IF NONE OF THE ABOVE, DON'T KNOW, REFUSED → 901
MODULE NINE: ALCOHOL USE			
Interviewer says: "The next few questions will be on your use of alcohol. Remember, all of the answers you provide will be kept confidential."			
901	How often do you have a drink containing alcohol?	NEVER=0 MONTHLY OR LESS=1 2-4 TIMES A MONTH=2 2-3 TIMES A WEEK=3 4 OR MORE TIMES A WEEK=4 DON'T KNOW=-8 REFUSED=-9	IF NEVER, DON'T KNOW, REFUSED → 1001
902	How many drinks containing alcohol do you have on a typical day?	1 OR 2=0 3 OR 4=1 5 OR 6=2 7 TO 9=3 10 OR MORE=4 DON'T KNOW=-8 REFUSED=-9	
903	How often do you have six or more drinks on one occasion?	NEVER=0 LESS THAN MONTHLY=1 MONTHLY=2 WEEKLY=3 DAILY OR ALMOST DAILY=4 DON'T KNOW=-8 REFUSED=-9	

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE TEN: EXPOSURE TO PREVENTION INTERVENTION AMONG 15-24 YEARS			
Interviewer says: “We will now ask you about your experience with HIV prevention program.”			
1001	Where can you get condoms? (INTERVIEWER: Select all that apply.)	CLINIC/HOSPITAL=A KIOSK/SHOP=B PHARMACY=C LOCAL FREE DISPENSER=D FRIENDS/PEER=E SEXUAL PARTNER(S)=F OTHER (SPECIFY) =X DON'T KNOW=-Y REFUSED=-Z	
1002	If you wanted a condom, would it be easy for you to get one?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF YES, DON'T KNOW, REFUSED → 1004
1003	Why is it not easy for you to get a condom?	CONDOMS NOT AVAILABLE/TOO FAR=A NOT CONVENIENT=B COSTS TOO MUCH=C EMBARRASSED TO GET CONDOMS=D DO NOT WANT OTHERS TO KNOW=E DO NOT KNOW WHERE TO GET CONDOMS=F COVID-19 PARTIAL LOCKDOWN =G OTHER (SPECIFY) =X DON'T KNOW=Y REFUSED=Z	
1004	How confident would you feel to negotiate condom use with a sexual partner?	HIGH CONFIDENCE = 1 MODERATE CONFIDENCE = 2 SLIGHT CONFIDENCE= 3 NO CONFIDENCE = 4 DON'T KNOW = -8 REFUSED = -9	
1005	Have you ever talked with a parent or guardian about sex?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
1006	Have you ever discussed HIV with your parents or guardians?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
1007	Have you taken part in any of the following prevention or treatment programs? (INTERVIEWER: SELECT ALL THAT APPLY.)	DREAMS = A SITAKHELA LIKUSASA = B KWAKHA INDVODZA = C TEEN CLUBS = D STEPPINGSTONES = E K1-BOYS = F GLOW BRO = G NONE = W OTHER (SPECIFY) =X DON'T KNOW=Y REFUSED=Z	

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE TEN: EXPOSURE TO PREVENTION INTERVENTION AMONG 15-24 YEARS (continued)			
1008	In the past 12 months, how many times have you participated in a school meeting or class period where they talked about HIV/AIDS? If you are not certain, give your best guess.	NONE=0 1-4 TIMES=1 5-9 TIMES=2 10 OR MORE TIMES=3 DID NOT ATTEND SCHOOL IN THE PAST 12 MONTHS=4 DON'T KNOW=-8 REFUSED=-9	
Interviewer says: "Thank you for taking the time to participate in this survey. Your responses will be very helpful to the Ministry of Health to better understand how to improve health programs in the country." (Provide participant with list of organizations, if not already given.)			
COMMENTS FROM INTERVIEWER:			

APPENDIX G SURVEY CONSENT FORMS

CONSENT FOR HOUSEHOLD INTERVIEW (18 + YEARS AND EMANCIPATED MINORS AGED 15-17 YEARS)

What language do you prefer for our discussion today?

English siSwati

TITLE OF STUDY: THIS STUDY IS SHIMS3 2020: A POPULATION-BASED HIV IMPACT ASSESSMENT (PHIA).

Interviewer reads:

Hello. My name is _____. I would like to invite you to take part in this study about HIV in Eswatini. The Government of Eswatini through the Ministry of Health is leading this study and is conducting it with the United States Centers for Disease Control and Prevention (CDC), ICAP at Columbia University, and Westat.

Purpose of the study

HIV is a virus that causes an illness called AIDS. HIV and AIDS can be treated by taking medicines regularly.

This study will help us know how many people in Eswatini have HIV and need health services. We expect more than 12,000 people from the age of 15 years to take part. About 7,000 households throughout Eswatini will be approached to take part in the study. Your household is invited to participate even if people in the household are already aware of their HIV status or were recently tested for HIV. Your taking part will help the Ministry of Health improve HIV services in the country.

This form might have some words in it that are not familiar to you. Please ask me to explain anything that you do not understand.

Study procedures

If you join this study:

- In the household interview, we would like to ask you some questions about the people who live here. We will also ask you about support you receive and some of the things you have or own. After the household interview, we will invite you and others living in your household to take part in individual interviews. The questions will be about your age, the work you do, your health and experience with health services, and social and sexual behavior. The interview may take about 20 to 30 minutes.
- The survey information is collected on this tablet. The information is stored securely and can only be accessed by selected study staff. The interview will take place in private, here in your house, or a nearby private area of your choosing.
- We will ask each person to give permission to take part before joining the study. Study procedures also include blood draw, HIV testing, and storage of that blood for future testing if you agree to this. The testing and counseling will take about 45 minutes. If a household member does not take part in the study, he/she will not be tested for HIV. However, we can refer him/her to a health facility where those services are provided.

Alternatives to taking part

You can decide not to take part in this study. If you choose to take part in the study, you may change your mind at any time and stop taking part. If you decide not to take part, it will not affect your healthcare in any way, and we can tell you where to go for HIV services to learn about your HIV status. If you decide to leave the study, no more information will be collected from you. However, you will not be able to take back the information that has already been collected and shared.

Costs for being in the survey

There is no cost to you for being in the study, apart from your time.

Benefits

The main benefit for you to be in the study is the chance to learn more about your health today. Additionally, the information you provide to us will be used to improve healthcare services in Eswatini.

Risks

The risks of taking part in the household interview are small. You may feel uncomfortable about some of the questions we will ask. You can refuse to answer any specific question. We will do everything we can to keep your information confidential. As with all studies, there is a chance that someone could find out you participated in the study. We are doing everything possible to ensure confidentiality and minimize this risk.

Confidentiality and access to your health information

We will do everything we can to keep your answers confidential. The information we collect from you will be identified by a number and not by your name. Your name will not appear when we share study findings and study data. The data from this study will be released to the public without any identifiers, and this will not require another consent from you. Your name and contact information will not be released outside of the study groups listed unless there is an issue of safety.

The following individuals and/or agencies will be able to look at your interview records to help oversee the conduct of this study:

[INTERVIEWER: INDICATE THE FOLLOWING INFORMATION TO THE PARTICIPANT- DO NOT READ ALOUD]

- Staff members from the Institutional Review Boards or Ethics Committees overseeing the conduct of this study to ensure that we are protecting your rights as a person taking part in a study, including:
 - The Eswatini Health and Human Research Review Board (EHHRRB; Mbabane, Eswatini)
 - The Centers for Disease Control and Prevention (CDC; Atlanta, GA, USA)
 - Columbia University Medical Center (New York, NY, USA)
 - Westat (a statistical study research organization) (Rockville, MD, USA)
- The United States Office of Human Research Protections and other government agencies that oversee the safety of human subjects to ensure we are protecting your rights as a person taking part in this study
- Selected study staff and study monitors.

[INTERVIEWER: READ FROM HERE]

This study has received approval from the Eswatini Health and Human Research Review Board and the Institutional Review Boards of the Centers for Disease Control and Prevention, Columbia University Medical Center, and Westat.

Whom should you contact if you have questions?

If you would like to have more information about the study, you may contact:

[INTERVIEWER: INDICATE THE FOLLOWING INFORMATION TO THE PARTICIPANT- DO NOT READ ALOUD]

Sindisiwe Dlamini

Address: Ministry of Health, PO Box 5, Mbabane, Eswatini.

Office Phone: +268 2404 4905 Mobile Phone: +268 7817 0849

Email: sindydlamini36@gmail.com

[INTERVIEWER: READ FROM HERE]

If you have issues related to injuries or other harms, or for questions about the process of agreeing to take part in this study or for more information about your rights as someone taking part in this study, you may contact:

[INTERVIEWER: INDICATE THE FOLLOWING INFORMATION TO THE PARTICIPANT- DO NOT READ ALOUD]

Babazile Shongwe

Address: Eswatini Health and Human Research Review Board, P.O Box 5, Mbabane, Eswatini

Office Phone: +268 2404 7751 Mobile Phone: +268 7694 0444

Email: babazileshongwe@gmail.com

[INTERVIEWER: READ FROM HERE]

Do you want to ask me anything about the study?

[INTERVIEWER LISTENS TO QUESTIONS AND RESPONDS ACCORDINGLY, ADDRESSING ALL CONCERNS RAISED BY THE POTENTIAL PARTICIPANT]

CONSENT STATEMENT

By answering the questions below, you confirm that you have been read this consent form. You were encouraged and given time to ask questions. You know that your participation in this research is voluntary and you have the right to stop the interview at any time or skip any question you do not want to answer. Any questions that you had regarding the survey have been answered satisfactorily and you have been offered a copy of this consent form.

Do you agree to do the household interview?

If you agree to take part in the household interview, please state the following statement:

"I agree to take part in the household interview."

Check this box if participant agrees to participate in the household interview.

If you refuse to take part in the household interview, please state the following statement:

"I do not wish to take part in the household interview."

Check this box if participant refuses to participate in the household interview.

[Tablet summary statement]

To confirm, you have agreed to <INSERT ALL OPTIONS MARKED YES: HOUSEHOLD INTERVIEW>. Is this correct?

Yes No

Printed name of Household Head _____

HH ID number _____

Signature of person obtaining consent _____ Date: __/__/__

Printed name of person obtaining consent _____

Study staff SHIMS3 ID number _____

INDIVIDUAL CONSENT FOR ADULTS AGED 18 YEARS AND CHILDREN WITH SPECIAL CIRCUMSTANCES AGED 15-17

(SKIP IF PARTICIPANT ALREADY COMPLETED HOUSEHOLD CONSENT)

What language do you prefer for our discussion today?

English siSwati

TITLE OF STUDY: THIS STUDY IS SHIMS3 2020: A POPULATION-BASED HIV IMPACT ASSESSMENT (PHIA).

Interviewer reads:

Hello. My name is _____. I would like to invite you to take part in this study about HIV in Eswatini. The Government of Eswatini through the Ministry of Health is leading this study and is conducting it with the United States Centers for Disease Control and Prevention (CDC), ICAP at Columbia University, and Westat.

Purpose of study

HIV is a virus that causes an illness called AIDS. HIV and AIDS can be treated by taking medicines regularly.

This survey will help us know how many people in Eswatini have HIV and need health services. We expect more than 12,000 people from the age of 15 years to take part. About 7,000 households throughout Eswatini will be approached to take part in the study. You are invited to participate even if you are already aware of your HIV status or were recently tested for HIV. Your participation will help the Ministry of Health improve HIV services in the country.

This form might have some words in it that are not familiar to you. Please ask me to explain anything that you do not understand.

Survey procedures

- The information is collected on this tablet. The information is stored securely and can only be accessed by selected study staff. The interview will take place in private, here in your house, or an acceptable nearby private area of your choosing.

(READ FROM HERE IF PARTICIPANT ALREADY COMPLETED THE HOUSEHOLD CONSENT)

- If you join this study, we will ask you questions. The questions will be about your age, the work you do, your health and experience with health services, and your social and sexual behavior. The interview will take about 20 to 30 minutes. The interview will take place in a private area in or around your home.
- Study procedures also include blood draw, HIV testing, and storage of that blood for future testing if you agree to this. The testing and counseling will take about 45 minutes.
 - If you agree to the HIV testing, a study staff member who has been trained to draw blood, will take about 14 milliliters (about a tablespoonful) of blood from your arm into two tubes. If it is not possible to take blood from your arm, then we will try to take a few drops of blood from your finger. The blood test will take place here in or around your household. We will give you the results of your HIV test and provide counseling on the same day.
 - If you have a positive HIV test result, we will give you a referral form and information so you can consult with a doctor or nurse to learn more about the test results.
 - If you test positive for HIV, we will send your blood to a laboratory to measure your viral load and CD4 count. Viral load is the amount of HIV in your blood. CD4 cells are the part of the immune system that fights HIV infection and other diseases. These results will be sent to a health facility of your choosing in about 8 to 12 weeks. You will be able to talk to a nurse or doctor at that facility about your results. Some of your blood will be sent to a laboratory out of the country for additional tests related to HIV. If we have test results that might help guide your treatment, we will return them to a clinic. If you have given us your contact information, we will contact you to tell you how you and your doctor or nurse may get these results.
- We would also like to ask you to allow us to store your leftover blood for future research tests. These tests may be related to HIV or other health issues important to people living in Eswatini. This sample will be stored for an indefinite amount of time but your name will be on the sample for only five years. We will attempt to tell you about any test results during the five-year period that are important to your health. After the five-year period, the sample will not have your name on it, so we will not be able to tell you the results of these future research tests. Your leftover blood will not be sold or used for profit but may be shared with outside investigators after removal of all personal identifiers, without asking for your consent again. If you do not agree to

long-term storage of your blood samples, you can still take part in the study and we will destroy your blood samples after the study testing is complete. If you agree today to store your blood but change your mind later in the next five years, you can call the number provided at the end of this consent form and have your stored specimen destroyed. If you change your mind after five years, once your name is removed from the sample, we will not be able to destroy your sample. Any future studies conducted using your blood sample will be approved by the appropriate institutions overseeing those studies.

- Additionally, you may be eligible to take part in future studies related to health in Eswatini. We are asking for your permission to contact you in the next five years if such an opportunity occurs. To do this, approved researchers will be able to request access to your contact information. If they contact you, they will give you details about the new study and invite you to join the study. You may decide at that time that you do not want to take part in that study. If you do not wish to be contacted about future studies, it does not affect your taking part in this study.

(SKIP TO "BENEFITS" IF PARTICIPANT ALREADY WENT THROUGH THE HOUSEHOLD CONSENT)

Alternatives to taking part

You can decide not to take part in this study. If you choose to take part in the study, you may change your mind at any time and stop taking part. If you decide not to take part, it will not affect your healthcare in any way. We can tell you where to go for HIV services and learn about your HIV status. If you decide to leave the study, no more information will be collected from you.

However, you will not be able to take back the information that has already been collected and shared.

Costs for being in the study

There is no cost to you for being in the study, apart from your time.

[READ FROM HERE IF PARTICIPANT ALREADY COMPLETED THE HOUSEHOLD CONSENT]

Benefits

The main benefit for you to be in the study is the chance to learn more about your health today. Some people who take part will test HIV positive. If you test HIV positive for the first time, you will learn your HIV-positive status and where to go for HIV services. HIV care and treatment provided by the Ministry of Health is free and you will be offered assistance in enrolling in care. If you already know you have HIV and are not on treatment, you will get information to help your doctor or nurse determine if you are ready to start treatment. If you are HIV positive and on HIV treatment, the viral load tests can help your nurse or doctor judge how well your treatment is working. If you test HIV negative, you will learn about what you can do to stay HIV negative.

Your taking part in this study could help us learn more about HIV in Eswatini can help us learn about how HIV prevention and treatment programs are working in the country.

Risks

The risks involved with taking part in the study are small. You may feel uncomfortable about some of the questions we will ask. You can refuse to answer any question. The risks to you from having your blood drawn are also minor. They include brief pain from the needle stick, bruising, lightheadedness, bleeding and, rarely, infection where the needle enters the skin. The study staff member who will perform the blood draw has received training on how to draw blood. If you experience any discomfort or any of the symptoms mentioned above, please let us know, especially if there is any bleeding or swelling.

Learning you have HIV may cause some emotional distress. If you test HIV positive, you will receive counseling on how to cope with learning that you have HIV. We will explain options for care and help you identify where to go for treatment. Care and treatment is available at government facilities free of charge.

There is a chance that someone could find out you took part in the study. We are doing everything possible to ensure confidentiality and minimize this risk.

[SKIP TO "DO YOU WANT TO ASK ME ANYTHING ABOUT THE STUDY?" IF PARTICIPANT ALREADY WENT THROUGH HOUSEHOLD CONSENT]

Confidentiality and access to your health information

We will do everything we can to keep your answers confidential. The information we collect from you will be identified by a number and not by your name. Your name will not appear when we share study findings and study data. The data from this study will be released to the public without any identifiers, and this will not require another consent from you. Your name and contact information will not be released outside of the study groups listed unless there is an issue of safety.

The following individuals and/or agencies will be able to look at your interview records to help oversee the conduct of this study:

[INTERVIEWER: INDICATE THE FOLLOWING INFORMATION TO THE PARTICIPANT- DO NOT READ ALOUD]

- Staff members from the Institutional Review Boards or Ethics Committees overseeing the conduct of this study to ensure that we are protecting your rights as a person taking part in a study, including: :
 - The Eswatini Health and Human Research Review Board (EHRRB; Mbabane, Eswatini)
 - The Centers for Disease Control and Prevention (CDC; Atlanta, GA, USA)
 - Columbia University Medical Center (New York, NY, USA)
 - Westat (a statistical study research organization) (Rockville, MD, USA)
- The United States Office of Human Research Protections and other government agencies that oversee the safety of human subjects to ensure we are protecting your rights as a person taking part in this study.
- Selected study staff and study monitors.

[INTERVIEWER: READ FROM HERE]

This study has received approval from the Eswatini Health and Human Research Review Board and the Institutional Review Boards of the Centers for Disease Control and Prevention, Columbia University Medical Center, and Westat.

Whom should you contact if you have questions?

If you would like to have more information about the study, you may contact:

[INTERVIEWER: INDICATE THE FOLLOWING INFORMATION TO THE PARTICIPANT- DO NOT READ ALOUD]

Sindisiwe Dlamini

Address: Ministry of Health, PO Box 5, Mbabane, Eswatini.

Office Phone: +268 2404 4905 Mobile Phone: +268 7817 0849

Email: sindydlamini36@gmail.com

[INTERVIEWER: READ FROM HERE]

If you have issues related to injuries or other harms, or for questions about the process of agreeing to take part in this study or for more information about your rights as someone taking part in this study, you may contact:

[INTERVIEWER: INDICATE THE FOLLOWING INFORMATION TO THE PARTICIPANT- DO NOT READ ALOUD]

Babazile Shongwe

Address: Eswatini Health and Human Research Review Board, P.O Box 5, Mbabane, Eswatini

Office Phone: +268 2404 7751 Mobile Phone: +268 7694 0444

Email: babazileshongwe@gmail.com

(READ FROM HERE IF PARTICIPANT ALREADY COMPLETED HOUSEHOLD CONSENT)

Do you want to ask me anything about the study?

[INTERVIEWER LISTENS TO QUESTIONS AND RESPONDS ACCORDINGLY, ADDRESSING ALL CONCERNS RAISED BY THE POTENTIAL PARTICIPANT]

CONSENT STATEMENT

By answering the questions below, you confirm that you have been read this consent form. You were encouraged and given time to ask questions. You know that your participation in this research is voluntary and you have the right to stop the interview at any time or skip any question you do not want to answer. Any questions that you had regarding the survey have been answered satisfactorily and you have been offered a copy of this consent form.

1. Do you agree to take part in the individual interview? If you agree to take part in the individual interview, please state the following statement:

“I agree to take part in the individual interview.”

Check this box if participant agrees to participate in the individual interview.

If you refuse to take part in the individual interview, please state the following statement:

“I do not wish to take part in the individual interview.”

Check this box if participant refuses to participate in the individual interview.

(IF PARTICIPANT DOES NOT AGREE, THEN SKIP TO STATEMENT 4)

2. Do you agree to give blood for HIV testing and related testing? If you agree to give blood for HIV testing and related testing, please state the following statement:

“I agree to give blood for HIV testing and related testing.”

Check this box if participant agrees to give blood for HIV testing and related testing.

If you refuse to give blood for HIV testing and related testing, please state the following statement:

“I do not wish to take part in blood testing today.”

Check this box if participant refuses blood testing.

(IF PARTICIPANT DOES NOT AGREE, THEN SKIP TO STATEMENT 4)

3. Do you agree to have your leftover blood stored for future research? If you agree to have your leftover blood stored for future research, please state the following statement.

“I agree to have my leftover blood stored for future research.”

Check this box if participant agrees to have his/her leftover blood stored for future research.

If you refuse to have your blood stored for future research, please state the following statement:

“I do not wish to have my leftover blood stored for future research.”

Check this box if participant refuses to have his/her leftover blood stored for future research.

4. Do you agree to be contacted for future research? If you agree to be contacted for future research, please state the following statement:

“I agree to be contacted for future research.”

Check this box if participant agrees to be contacted for future research.

If you refuse to be contacted for future research, please state the following statement:

“I do not wish to be contacted for future research.”

Check this box if participant refuses be contacted for future research.

[Tablet summary statement]

To confirm, you have agreed to < INSERT ALL OPTIONS MARKED YES: INTERVIEW, FUTURE RESEARCH, BLOOD TESTING, BLOOD STORAGE >, is this correct?

Yes No

Printed name of Participant _____

Participant ID number _____

Signature of person obtaining consent _____

Date: __/__/__

Printed name of person obtaining consent _____

Study staff SHIMS3 ID number _____

PARENTAL OR GUARDIAN PERMISSION FOR PARTICIPANTS AGED 15-17 YEARS; ALLOW INTERVIEW, BLOOD TESTING, BLOOD STORAGE, CONTACT FOR FUTURE RESEARCH

What language do you prefer for our discussion today?

English siSwati

TITLE OF STUDY: THIS STUDY IS SHIMS3 2020: A POPULATION-BASED HIV IMPACT ASSESSMENT (PHIA).

Interviewer reads:

Hello. My name is _____. I would like to invite your minor to take part in this study about HIV in Eswatini. The Government of Eswatini through the Ministry of Health is leading this study and is conducting it with the United States Centers for Disease Control and Prevention (CDC), ICAP at Columbia University, and Westat. Please ask me to explain anything that you do not understand.

(SKIP IF PARTICIPANT ALREADY COMPLETED THE HOUSEHOLD OR INTERVIEW CONSENT)

Purpose of study

HIV is a virus that causes an illness called AIDS. HIV and AIDS can be treated by taking medicines regularly.

This study will help us know how many people in Eswatini have HIV and need health services. We expect more than 12,000 people ages 15 years and older to take part. About 7,000 households throughout Eswatini will be approached to take part in the study. Your child of 15-17 years is invited to participate even if his/her HIV status is already known, or s/he was recently tested for HIV. Your child's participation will help the Ministry of Health improve HIV services in the country.

This form might have some words in it that are not familiar to you. Please ask me to explain anything that you do not understand.

Study procedures

- The information is collected on this tablet. The information is stored securely and can only be accessed by selected study staff. The interview will take place in private, here in your house, or an acceptable nearby private area of your child's choosing.

(READ FROM HERE IF PARTICIPANT ALREADY COMPLETED THE HOUSEHOLD OR INTERVIEW CONSENT)

- If both you and your minor agree for him/her to join the study, we will ask your minor some questions. The interview questions will be the same as the ones that we ask adults who agree to take part in the study. The questions will be about what kind of work he/she does, whether he/she has had any experience with health services, and his/her social and sexual behaviors. Your minor's answers will not be shared with you. The interview will take about 20 to 30 minutes. The interview will be conducted in private with only the minor and a study staff member.
- Study procedures also include blood draw, HIV testing, and storage of that blood for future testing if you and your minor agree to this. The testing and counseling will take about 45 minutes.
 - A study staff member, who has been trained to draw blood, will take about 14 milliliters (about a tablespoonful) of blood from your minor's arm into two tubes. If it is not possible to take blood from your minor's arm, then we will try to take a few drops of blood from your minor's finger and then perform the tests for HIV in your home. We will give your minor the results of these tests and provide counseling about the results on the same day as the test.
 - For all minors who test positive for HIV, we will also send his or her blood to a laboratory to measure his or her viral load and CD4 count. Viral load is the amount of HIV in the blood. CD4 cells are the part of the immune system that fights HIV infection and other diseases. If he or she provides us with the name of a health facility, we can send his or her viral load and CD4 results there in about 8 to 12 weeks from now. Some of your minor's blood will be sent to a laboratory out of the country for some additional tests related to HIV. If we have test results that might guide your minor's care or treatment, we will return them to a clinic. If he or she provides us with his or her contact information, we will contact him/her about how he/she and a doctor or nurse at the preferred health facility may get these results.
 - If your minor tests HIV positive, we will provide your minor with a referral for HIV care.
 - Additionally, we would like to ask your permission to store your minor's leftover blood for future research tests. These tests may be about HIV or other health issues important for the health of people living in Eswatini. This sample will be stored for an indefinite amount of time, but the name of your minor will be on the sample for only five years. We will attempt to tell your minor about any test results during the five-year period that are important to your minor's health. After the five-year period, the sample will not have your minor's name on it and so we will not be able to tell your minor the results of the future research

tests. Your minor's leftover blood samples will not be sold or used for profit but may be shared with outside investigators after removal of all identifiers, without asking for your consent again. If you do not agree to long term storage of your minor's blood samples, your minor can still take part in the study, and we will destroy your minor's blood samples after this study-related testing is complete. If you agree today to storage of your minor's blood but change your mind later in the next five years, you can call the number provided at the end of this consent form and have your minor's stored specimen destroyed. If you change your mind after five years, once your minor's name is removed from the sample, we will not be able to destroy your minor's sample. Any future studies conducted using your blood sample will be approved by the appropriate institutions overseeing those studies.

- Finally, your minor may be eligible to take part in future studies related to health in Eswatini. We are asking for your permission to contact your minor in the next five years if such an opportunity occurs. To do this, approved researchers will be able to request access his or her contact information. If they contact him/her, they will give your minor details about the new study and invite him or her to join the study. Your minor may decide at that time that he or she does not want to take part in that study. If he or she does not wish to be contacted about future studies, it does not affect him/her taking part in this study.

Alternatives to taking part

Your minor can decide not to take part in this study. If your minor chooses to take part in the study, he/she may change his or her mind at any time and stop taking part. If he or she decides not to take part, it will not affect his/her healthcare in any way. We can tell you where to go for HIV services and learn about your HIV status. If he or she decides to leave the study, no more information will be collected from him/her. However, your minor will not be able to take back the information that has already been collected and shared.

Costs for being in the study

There is no cost to you or your minor for being in the study, apart from his or her time.

Benefits

The main benefit for your minor to be in the study is the chance to learn more about his/her health today. If your minor tests HIV positive, the benefit is that your minor will learn where to go for HIV services. HIV care and treatment provided by the Ministry of Health is free. If you or your minor already know he/she has HIV and is not on treatment, you or your minor will get information to help his/her doctor or nurse determine if your minor is ready to start treatment. If you or your minor already knows he/she is HIV positive and is on HIV treatment, the viral load tests can help your minor's nurse or doctor judge how well the treatment is working. If your minor tests HIV negative, you or your minor will learn about how he/she can stay HIV negative.

Your minor's taking part in this study could help us learn more about HIV in Eswatini. It can help us learn about how HIV prevention and treatment programs are working in the country.

Risks

The risks involved with taking part in the study are small. Your minor may feel uncomfortable answering some of the questions. Your minor does not have to answer questions he/she feels are too personal or that make him/her feel uncomfortable.

The risks to your minor from having his/her blood drawn are also minor. They include brief pain from the needle stick, bruising, lightheadedness, bleeding, and rarely, infection where the needle enters the skin. The study staff member who will perform the blood draw has received training on how to draw blood. If he/she experiences any discomfort or any of the symptoms mentioned above, please let us know, especially if there is any bleeding or swelling.

Your minor may learn that he/she is HIV positive. Learning that he/she has HIV may cause some emotional distress. If he/she tests positive for HIV, he/she will receive counseling on how to cope with learning that he/she has HIV. We will help your minor identify where to go and explain the options available for care and treatment. Care and treatment is available at government facilities free of charge.

As with all studies, there is a chance that someone could find out your minor participated in the study. We are doing everything possible to ensure confidentiality and minimize this risk.

Confidentiality and access to your health information

We will do everything we can to keep your minor's taking part in the study and his/her answers confidential. The information we collect from your minor will be identified by a number and not by his/her name. His/her name will not appear when we share study results and study data. The data from this study will be released to the public without any identifiers, and this will not require another consent from you. Their name and contact information will not be released outside of the study groups listed unless there is an issue of safety.

Anyone in the household under 18 years of age, who reports having experienced violence, whether they participated in the study or not, will be provided with a referral to a relevant facility, which offers services for all forms of violence, and to police where necessary.

[SKIP TO "DO YOU WANT TO ASK ME ANYTHING ABOUT THE STUDY?" IF PARTICIPANT ALREADY COMPLETED THE HOUSEHOLD OR INTERVIEW CONSENT]

The following individuals and/or agencies will be able to look at your minor's interview records to help oversee the conduct of this study:

[INTERVIEWER: INDICATE THE FOLLOWING INFORMATION TO THE PARTICIPANT- DO NOT READ ALOUD]

- Staff members from the Institutional Review Boards or Ethics Committees overseeing the conduct of this study to ensure that we are protecting your child's rights as a person taking part in a study, including:
 - Eswatini Health and Human Research Review Board (EHRRB; Mbabane, Eswatini)
 - The Centers for Disease Control and Prevention (CDC; Atlanta, GA, USA)
 - Columbia University Medical Center (New York, NY, USA)
 - Westat (a statistical study research organization) (Rockville, MD, USA)
- The United States Office of Human Research Protections and other government agencies that oversee the safety of human subjects to ensure we are protecting your minor's rights as a person taking part in this study.
- Selected study staff and survey monitors.

[INTERVIEWER: READ FROM HERE]

This study has received approval from the Eswatini Health and Human Research Review Board and the Institutional Review Boards of the Centers for Disease Control and Prevention, Columbia University Medical Center, and Westat.

Whom should you contact if you have questions?

If you would like to have more information about the study, you may contact:

[INTERVIEWER: INDICATE THE FOLLOWING INFORMATION TO THE PARTICIPANT- DO NOT READ ALOUD]

Sindisiwe Dlamini

Address: Ministry of Health, PO Box 5, Mbabane, Eswatini.

Office Phone: +268 2404 4905 Mobile Phone: +268 7817 0849

Email: sindydlamini36@gmail.com

[INTERVIEWER: READ FROM HERE]

If you have issues related to injuries or other harms, or for questions about the process of agreeing to take part in this study or for more information about your minor's rights as someone taking part in this study, you may contact:

[INTERVIEWER: INDICATE THE FOLLOWING INFORMATION TO THE PARTICIPANT- DO NOT READ ALOUD]

Babazile Shongwe

Address: Eswatini Health and Human Research Review Board, P.O Box 5, Mbabane, Eswatini

Office Phone: +268 2404 7751 Mobile Phone: +268 7694 0444

Email: babazileshongwe@gmail.com

[READ FROM HERE IF PARTICIPANT ALREADY COMPLETED THE HOUSEHOLD OR INTERVIEW CONSENT]

Do you want to ask me anything about your child's participation the study?

[INTERVIEWER LISTENS TO QUESTIONS AND RESPONDS ACCORDINGLY, ADDRESSING ALL CONCERNS RAISED BY THE POTENTIAL PARTICIPANT]

PERMISSION STATEMENT

By answering the questions below, you confirm that you have been read this consent form. You were encouraged and given time to ask questions. Any questions that you had regarding the survey have been answered satisfactorily and you have been offered a copy of this permission form.

1. Do you agree that we can ask this child to do the interview?

If you agree for us to ask this child to do the interview, please state the following statement:

“I give permission to the study team to ask this child to take part in the interview.”

Check this box if parent/guardian agrees to allow us to ask this child to take part in the interview.

If you refuse for us to ask your child to do the interview, please state the following statement:

“I do not wish for the study team to ask this child to take part in the interview.”

Check this box if parent/guardian refuses to allow the study team to ask this child to take part in the interview.

(IF PARTICIPANT DOES NOT AGREE, THEN SKIP TO STATEMENT 4)

2. Do you agree that we can approach this child to give blood for HIV testing and related testing?

If you agree for us to ask this child to give blood for HIV testing and related testing, please state the following statement:

“I give permission for the study team to ask this child to give blood for HIV testing and related testing.”

Check this box if parent/guardian agrees for study team to ask this child to take part in the blood draw.

If you refuse for us to ask your child to give blood for HIV testing and related testing, please state the following statement:

“I do not wish for the study team to ask this child to take part in blood testing today.”

Check this box if parent/guardian refuses to allow the study team to ask this child to take part in the blood draw.

(IF PARTICIPANT DOES NOT AGREE, THEN SKIP TO STATEMENT 4)

3. Do you agree to allow us to ask this child to have their leftover blood stored for future research?

If you agree for us to ask this child to have their leftover blood stored for future research, please state the following statement:

“I give permission for the study team to ask this child to have their leftover blood stored for future research.”

Check this box if parent/guardian agrees for study team to ask this child to have his or her leftover blood stored for future research.

If you refuse for the study team to ask this child to have their leftover blood stored for future research, please state the following statement:

“I do not wish for the study team to ask this child to have their leftover blood stored for future research.”

Check this box if parent/guardian refuses to have study team ask this child to have his or her leftover blood stored for future research.

4. Do you agree for us to ask this child to be contacted for future research?

If you agree for us to ask this child for us to retain his or her contact information for future research, please state the following statement:

“I give permission to the study team to ask this child to be contacted for future research.”

Check this box if parent/guardian agrees to allow us to ask this child to be contacted for future research.

If you refuse for us to ask this child if he or she is willing to be contacted for future research, please state the following statement:

“I do not wish the study team to ask this child if he or she wants to be contacted for future research.”

Check this box if parent/guardian refuses to allow the study team to ask this child if he or she wants to be contacted for future research.

[Tablet summary statement]

To confirm, you have agreed to <INSERT ALL OPTIONS MARKED YES: APPROACH CHILD FOR INTERVIEW, APPROACH CHILD FOR FUTURE RESEARCH, APPROACH CHILD FOR BLOOD TESTING, APPROACH CHILD TO SHARE CONTACT INFORMATION, AND APPROACH CHILD FOR BLOOD STORAGE>, is this correct?

Yes No

Printed name of Parent/legal guardian _____

Signature of person obtaining consent _____

Date: __/__/__

Printed name of person obtaining consent _____

Study staff SHIMS3 ID number _____

Child's name (print) _____

INDIVIDUAL ASSENT FOR PARTICIPANTS 15-17 YEARS: INTERVIEW, CONTACT FOR FUTURE RESEARCH, BLOOD DRAW, AND BLOOD STORAGE

What language do you prefer for our discussion today?

English siSwati

TITLE OF STUDY: THIS STUDY IS SHIMS3 2020: A POPULATION-BASED HIV IMPACT ASSESSMENT (PHIA).

Interviewer reads:

Hello. My name is _____. I would like to invite you to take part in a study. As a part of this study, we are asking people questions about themselves and also giving people a chance to learn if they have HIV. We are also asking people if we can keep some of their blood for future testing.

This form talks about our study and the choice that you have to take part in it. You can ask questions any time.

Why are we doing this study?

HIV is a virus. Being infected with HIV can lead to an illness often called AIDS. HIV and AIDS can be treated by taking medicines regularly. This study will help us know how many people in Eswatini have HIV and need health services. This study involves an interview, blood draw and HIV testing. You are invited to participate even if you already know your HIV status or were recently tested for HIV.

Your parent/guardian said it was okay for us to ask you to join.

This form might have some words that you may not have heard before. Please ask me to explain anything that you do not understand.

What would happen if you join this study?

If you decide to join the study, here is what would happen:

- If you join this study, we will ask you questions. We will ask you questions about your age, the work you do, your health and experience with health services, and your social and sexual behavior.
- The interview will take about 20 to 30 minutes.
- The interview will take place in private here in your house or a nearby area around your house.
- After we ask you the questions, if you agree, we will take some of your blood to test for HIV.
- We will use a needle to take about 14 milliliters (about a tablespoonful) of blood from your arm into two tubes. If it is not possible to take blood from your arm, then we will try to take a few drops of blood from your finger.
- It will take about 45 minutes to do the test and to talk to you about the results.
- If you test positive for HIV:
 - We will send your blood to a laboratory to measure your viral load and CD4 count. Viral load is the amount of HIV in your blood. CD4 cells are the part of the immune system that fights HIV infection and other diseases.
 - We will send your viral load and CD4 test results to a health facility of your choice in about 8 to 12 weeks. At the health facility, you will be able to talk to a nurse or doctor about your results.
 - Some of your blood will be sent to a laboratory out of the country for additional tests related to HIV. If we have test results that might help guide your treatment, we will return them to a clinic. If you have given us your contact information, we will contact you to tell you how you and your doctor or nurse may get these results.
- You may be eligible to take part in future studies related to health in Eswatini. We are asking for your permission to contact you in the next five years if such an opportunity occurs. To do this, approved researchers will be able to request access to your contact information. If they contact you, they will give you details about the new study and invite you to join the study. You may decide at that time that you do not want to take part in that study. If you do not wish to be contacted about future studies, it does not affect your taking part in this study.

- We will ask you if we can store some of your blood for future testing. These tests will help us learn about the health of people in Eswatini. This sample will be stored forever but your name will be on the sample only for five years. We will try to tell you about any test results during the next five years that are important for your health. After the five years, the sample will not have your name on it, and we will not be able to tell you the results of any future tests. Your leftover blood will not be used for anything other than these tests. Your blood will not be sold. After removing your personal information, the results of these tests may be shared with people outside the study, without asking for your permission again. If you do not agree to future storage and testing of your blood, we will destroy your blood after this study-related testing has finished, and you can still receive your test results and conduct the study interview. If you agree today to store your blood but change your mind later in the next five years, you can call the number provided at the end of this consent form to have your stored specimen destroyed. If you change your mind after five years, once your name is removed from the sample, we will not be able to destroy your sample. Any future tests done with your blood sample will be approved by the appropriate institutions overseeing those studies.

Alternatives to taking part

If you decide not to take part, it will not affect your healthcare in any way. We can tell you where to go for HIV services and learn about your HIV status. You can leave the study at any time for any reason. If you decide to leave the study, no more information will be collected from you. However, you will not be able to take back the information that has already been collected and shared.

Costs for being in the study

There is no cost to you for being in the study, apart from your time.

Could the study help me?

Being in the study may help you by learning whether or not you have HIV. We will give you the results of your HIV test and provide counseling to you. We will discuss with you how to share these results with your parent/guardian, if you decide to do so. If you test positive for HIV, you will learn about it and where to go for care and treatment of HIV. Care and treatment provided by the Government of Eswatini is free. Your taking part in this study will help us learn more about HIV in Eswatini.

Could bad things happen if you join this study?

You may feel uncomfortable answering some of the questions we will ask. You can refuse to answer any question at any time, and you can stop the interview at any time.

The needle may hurt when it is put into your arm. This pain will go away quickly. Sometimes the needle can leave a bruise on the skin. You might bleed a little or feel a little dizzy.

You may learn that you have HIV. Learning that you have HIV may cause you to feel worried. We will talk to help you find a clinic where you can receive treatment.

We will not tell anyone else what we talk about, but there is a small chance other people might find out. We will do everything we can to minimize this risk.

What else should you know about this study?

If you don't want to be in the study, you don't have to be. Nobody will get upset with you if you do not want to join the study.

It is also OK to say 'Yes' and change your mind later. You can stop being in the study at any time. If you want to stop, please tell us.

Confidentiality and access to your health information

We will do everything we can to keep your answers and test results confidential. The blood and information we collect from you will be identified by a number, not by your name. Besides you, no one else will know your test results except the people working on the study and people you may decide to tell.

Your name and contact information will not be released outside of the study groups listed unless there is an issue of safety. The following individuals and/or agencies will be able to look at your interview records to help oversee the conduct of this study:

[INTERVIEWER: INDICATE THE FOLLOWING INFORMATION TO THE PARTICIPANT- DO NOT READ ALOUD]

- Staff members from the Institutional Review Boards or Ethics Committees overseeing the conduct of this study to ensure that we are protecting your rights as a person taking part in a study, including:
 - Eswatini Health and Human Research Review Board (EHHRRB; Mbabane, Eswatini)
 - The Centers for Disease Control and Prevention (CDC; Atlanta, GA, USA)
 - Columbia University Medical Center (New York, NY, USA)
 - Westat (a statistical study research organization) (Rockville, MD, USA)

- The United States Office of Human Research Protections and other government agencies that oversee the safety of human subjects to ensure we are protecting your rights as a person taking part in this study.
- Selected study staff and study monitors.

[INTERVIEWER: READ FROM HERE]

This study has received approval from the Eswatini Health and Human Research Review Board and the Institutional Review Boards of the Centers for Disease Control and Prevention, Columbia University Medical Center, and Westat.

Whom should you contact if you have questions?

If you would like to have more information about the study, you may contact:

[INTERVIEWER: INDICATE THE FOLLOWING INFORMATION TO THE PARTICIPANT- DO NOT READ ALOUD]

Sindisiwe Dlamini

Address: Ministry of Health, PO Box 5, Mbabane, Eswatini.

Office Phone: +268 2404 4905 Mobile Phone: +268 7817 0849

Email: sindydlamini36@gmail.com

[INTERVIEWER: READ FROM HERE]

If you have issues related to injuries or other harms, or for questions about the process of agreeing to take part in this study or for more information about your rights as someone taking part in this study, you may contact:

[INTERVIEWER: INDICATE THE FOLLOWING INFORMATION TO THE PARTICIPANT- DO NOT READ ALOUD]

Babazile Shongwe

Address: Eswatini Health and Human Research Review Board, P.O Box 5, Mbabane, Eswatini

Office Phone: +268 2404 7751 Mobile Phone: +268 7694 0444

Email: babazileshongwe@gmail.com.

[INTERVIEWER: READ FROM HERE]

Do you want to ask me anything about the survey or your participation?

[INTERVIEWER LISTENS TO QUESTIONS AND RESPONDS ACCORDINGLY, ADDRESSING ALL CONCERNS RAISED BY THE POTENTIAL PARTICIPANT]

ASSENT STATEMENT

[INTERVIEWER LISTENS TO QUESTIONS AND RESPONDS ACCORDINGLY, ADDRESSING ALL CONCERNS RAISED BY THE POTENTIAL PARTICIPANT]

Any questions that you had regarding the survey have been answered satisfactorily, and you have been offered a copy of this assent form.

1. Do you agree to take part in the individual interview? If you agree to take part in the individual interview, please state the following statement:

“I agree to take part in the individual interview.”

Check this box if participant agrees to participate in the individual interview.

If you refuse to take part in the individual interview, please state the following statement:

“I do not wish to take part in the individual interview.”

Check this box if participant refuses to participate in the individual interview.

(IF PARTICIPANT DOES NOT AGREE, THEN SKIP TO STATEMENT 4)

2. Do you agree to give blood for HIV testing and related testing? If you agree to give blood for HIV testing and related testing, please state the following statement:

“I agree to give blood for HIV testing and related testing.”

Check this box if participant agrees to HIV testing and related testing.

If you refuse to give blood for HIV testing and related testing, please state the following statement:

“I do not wish to take part in blood testing today.”

Check this box if participant refuses blood testing.

(IF PARTICIPANT DOES **NOT** AGREE, THEN SKIP TO STATEMENT 4)

3. Do you agree to have your leftover blood stored for future research? If you agree to have your leftover blood stored for future research, please state the following statement:

“I agree to have my leftover blood stored for future research.”

Check this box if participant agrees to have his/her leftover blood stored for future research.

If you refuse to have your blood stored for future research, please state the following statement:

“I do not wish to have my leftover blood stored for future research.”

Check this box if participant refuses to have his/her leftover blood stored for future research.

4. Do you agree to be contacted for future research? If you agree to be contacted for future research, please state the following statement:

“I agree to be contacted for future research.”

Check this box if participant agrees to be contacted for future research.

If you refuse to be contacted for future research, please state the following statement:

“I do not wish to be contacted for future research.”

Check this box if participant refuses be contacted for future research.

[Tablet summary statement]

To confirm, you have agreed to < INSERT ALL OPTIONS MARKED YES: INTERVIEW, FUTURE RESEARCH, BLOOD TESTING, BLOOD STORAGE>, is this correct?

Yes No

Printed name of Child _____

Child’s participant ID number _____

Printed name of parent/guardian _____

Signature of person obtaining assent _____

Date: __/__/__

Printed name of person obtaining assent _____

Study staff SHIMS3 ID number _____





Eswatini Population-based HIV Impact Assessment 3 2021 (SHIMS3 2021)

This project is supported by the US President's Emergency Plan for AIDS Relief (PEPFAR) through CDC under the terms of cooperative agreement #U2GGH002173. The findings and conclusions are those of the authors and do not necessarily represent the official position of the funding agencies.



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