SWAZILAND HIV INCIDENCE MEASUREMENT SURVEY 2

SHIMS2 2016-2017

FINAL REPORT

APRIL 2019

SHIMS2
SWAZILAND HIV INCIDENCE MEASUREMENT SURVEY

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Swaziland HIV Incidence Measurement Survey 2 (SHIMS2) 2016-2017

SHIMS2 2016-2017 Collaborating Institutions

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Donor Support and Disclaimer

This project is supported by the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) through CDC under the terms of cooperative agreements #U2GGH001271 and #U2GGH001226. The findings and conclusions are those of the authors and do not necessarily represent the official position of the funding agencies.

Suggested Citation

Government of the Kingdom of Eswatini. Swaziland HIV Incidence Measurement Survey 2 (SHIMS2) 2016-2017. Final Report. Mbabane: Government of the Kingdom of Eswatini; April 2019.

Access This Report Online

Government of the Kingdom of Eswatini website: http://www.gov.sz/index.php/ministries-departments/ministry-of-health or www.shrswaziland.com
The SHIMS Project: http://SHIMS.icap.columbia.edu
The PHIA Project: https://phia.icap.columbia.edu

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GLOSSARY OF TERMS

90-90-90: An ambitious treatment target to help end the HIV epidemic. By 2020, 90% of all people living with HIV will know their HIV status; 90% of all people with diagnosed HIV infection will receive sustained antiretroviral therapy (ART); and 90% of all people receiving ART will have viral load (VL) suppression (VLS).

95-95-95: By 2030, 95% of all people living with HIV will know their HIV status; 95% of all people diagnosed with HIV will receive sustained ART; and 95% of all people receiving ART will have VLS.

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

Adults: Defined in this survey as the population of individuals 15 years of age and older.

Antiretroviral (ARV): A type of medication used to treat HIV.

Antiretroviral Therapy (ART): Treatment with ARVs that inhibit the ability of HIV to multiply in the body, leading to improved health and survival among people living with HIV.

ARV-adjusted Diagnosed: When participants had reported being aware of their HIV-positive status before receipt of HIV rapid testing in SHIMS2 or their prior diagnosis was identified by presence of detectable ARVs in their blood sample.

ARV-adjusted on Treatment: When participants reported currently taking ART or their treatment status was identified by presence of detectable ARVs in their blood sample.

Awareness of HIV Status: When participants who tested HIV positive in the survey reported knowing their HIV-positive status. Participants who tested HIV positive in the survey and reported a previous HIV-negative or indeterminate result, or never testing for HIV were classified as unaware of their HIV status.

CD4+ T-Cells: Cluster of Differentiation4+ 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 and has been used to determine the need for and response to ART.

Child with Special Circumstances: An emancipated minor; a child aged 12-17 years who is married, has a child of his/her own and is not currently living with parents, or is the decision maker in a household with no identified adult head of household.

Children: Defined in this survey as the population of individuals 0-14 years of age.

Elite Controllers: A small subset of people living with HIV whose immune systems are able to maintain viral load suppression for years without treatment.

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.

Human Immunodeficiency Virus (HIV): 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 the person living with HIV vulnerable to illnesses that a healthy immune system would have eliminated.

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 occurring during a given time period.

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

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

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

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: A legal condition whereby a person can give permission based upon a clear understanding of the facts, implications, and future consequences of an action. In order 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.

Intimate Partner Violence (IPV): Defined in this survey as physical or sexual violence by a current or former male intimate partner. An intimate partner is defined as a cohabitating partner, regardless of marital status.

Male Circumcision (MC): The removal of some or the entire foreskin (prepuce) from the penis. Medically supervised adult MC is a scientifically proven method for reducing a man's risk of acquiring HIV through heterosexual intercourse.

Prevention of Mother-to-Child-Transmission (PMTCT): Activities to prevent an HIV-positive woman passing HIV to her baby during pregnancy, labor and delivery, or breastfeeding. The United Nations recommends effective PMTCT to include a four-fold 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 of 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.

Elimination of Mother-to-Child Transmission of HIV: A reduction in mother-to-child-transmission of HIV to such a low level that it no longer constitutes a public health problem. This is defined as ≤50 new

pediatric infections per 100,000 live births and a transmission rate of either <5% in breastfeeding populations or <2% in nonbreastfeeding populations.

Tuberculosis: A contagious bacterial disease that spreads through the air and is a leading cause of death among people living with HIV in Africa.

Young People: Defined in this survey as the population of individuals 15-24 years of age.

List of Abbreviations

AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
ART	Antiretroviral Therapy
ARV	Antiretroviral
CDC	U.S. Centers for Disease Control and Prevention
CD4	CD4+ T-cell
CI	Confidence Interval
CSO	Central Statistical Office
DBS	Dried Blood Spot
EA	Enumeration Area
EIA	Enzyme Immunoassay
GKOE	Government of the Kingdom of Eswatini
HBTC	Home-Based Testing and Counseling
HIV	Human Immunodeficiency Virus
HTS	HIV Testing Services
IPV	Intimate Partner Violence
IQR	Interquartile Range
LAg	Limiting Antigen
LTC	Linkage to Care
MC	Male Circumcision
mL	Milliliters
µL	Microliters
MOH	Ministry of Health
MTCT	Mother-to-Child Transmission of HIV
PCR	Polymerase Chain Reaction
PEPFAR	U.S. President's Emergency Plan for AIDS Relief
PFR	Proportion False Recent
PHIA	Population-based HIV Impact Assessment
PLHIV	People Living with HIV
PMTCT	Prevention of Mother-to-Child Transmission of HIV
QA	Quality Assurance
QC	Quality Control
RNA	Ribonucleic acid
SHIMS	Swaziland HIV Incidence Measurement Survey
TB	Tuberculosis
TNA	Total Nucleic Acid
UNAIDS	Joint United Nations Program on HIV and AIDS
VL	Viral Load
VLS	Viral Load Suppression
WHO	World Health Organization

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FOREWORD

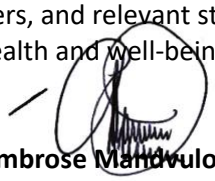
The Government of the Kingdom of Eswatini, formerly known as Swaziland, is pleased to present the second Swaziland HIV Incidence Measurement Survey 2016-2017 (SHIMS2) report. Following SHIMS conducted in 2011, SHIMS2 provides the first measure of the impact of HIV program scale-up in response to the HIV epidemic. It further provides useful information for policy direction and strategic planning for the HIV response in Eswatini and ensures adoption of new approaches toward achieving the country's goal of ending AIDS by 2022. SHIMS2 reflects the nation's journey in the fight against HIV and encourages policy makers to use this as a tool to mobilize financial, technical, and logistical resources to strengthen the national HIV response.

SHIMS2 results show a significant reduction in new infections by nearly half and doubling in the proportion of HIV-positive people with suppressed viral loads since 2011. SHIMS2 results also show significant achievements toward the 90-90-90 goals, with Eswatini at 87-89-91. These important data contribute to the national and global body of HIV knowledge to achieve an AIDS-free generation by 2022 in Eswatini and by 2030 globally. The findings indicate that the country is on the right path to end the epidemic despite its devastating effects over past decades.

SHIMS2 was led by the Government of the Kingdom of Eswatini (GKOE) Central Statistical Office, Ministry of Health, and National Emergency Response Council on HIV/AIDS (NERCHA) and implemented in partnership with ICAP at Columbia University (in Eswatini and New York). Technical and funding support were provided by the United States Centers for Disease Control and Prevention (CDC) through the President's Emergency Fund for AIDS Relief (PEPFAR).

The GKOE wishes to acknowledge the expert contributions of the SHIMS2 Core Leadership Group, Project Implementation Task Team, Technical Steering Committee, and the many stakeholders who contributed to and supported the survey. Sincere appreciation goes to all participating households for their time and cooperation, without which the survey would not have been a success.

On behalf of His Majesty's Government, I therefore call upon all sectors, agencies, policy makers, partners, and relevant stakeholders to use the scientific information in this document fully to improve the health and well-being of the people of the Kingdom of Eswatini.



Mr. Ambrose Mandvulo Dlamini
His Excellency, the Right Honorable Prime Minister of the Kingdom of Eswatini

ACKNOWLEDGEMENTS

The success of SHIMS2 2016-2017 was a result of the collaboration between the Government of the Kingdom of Eswatini (GKOE), ICAP Country and New York offices, and CDC Country and Atlanta offices. I thank the government entities that led this initiative, namely the Ministry of Health (MOH) and the Central Statistical Office (CSO), and appreciate the support provided by the National Emergency Response Council on HIV/AIDS (NERCHA).

The commitment and collaboration shown by the aforementioned entities led to the successful mobilization of stakeholders to support the project and the public to participate. The GKOE wishes to acknowledge the tireless efforts of the SHIMS2 Core Leadership Group, which comprised of the directorates of MOH, NERCHA, CSO, CDC Eswatini, the World Health Organization (WHO) Country Office, and ICAP Eswatini and New York Offices. I also extend sincere appreciation to the SHIMS2 Project Implementation Team, which included implementing staff from the Health Research Department, Eswatini Health Laboratory Services (EHLS), Health Promotion Unit (HPU), Eswatini National ART Program (ENAP), Sexual and Reproductive Health Unit (SRH), NERCHA Research Department, ICAP at Columbia University, CDC, and PEPFAR. The Ministry also recognizes the technical and implementation guidance provided by the SHIMS2 Technical and Steering Committee, Central Statistical Office, Deputy Prime Minister's Office, Health Research Department, SNAP, HPU, the Health Information and Management System , Rural Health Motivators' Program, Environmental Health Department, Epidemiology and Disease Control Unit, and the implementing partners including ICAP, Clinton Health Access Initiative (CHAI), Elizabeth Glaser Pediatric AIDS Foundation (EGPAF), University Research Co (URC), Institute for Health Measurement (IHM), Pact, Populations Services International (PSI), Baylor International Pediatric AIDS Initiative, WHO, and United Nations Family.

Thank you to the SHIMS2 Principal Investigators: Zandile Mnisi (MOH), Amos Zwane and Choice Ginindza (CSO), Harriet Nuwagaba-Biribonwoha (ICAP in Eswatini), Trong Ao (CDC Eswatini), Andrew Voetsch (CDC Atlanta), and Jessica Justman (ICAP in New York). We also greatly appreciate the contributions of the various task teams comprising of individuals from the above sectors and departments, as well as the Ministry of Tinkhundla and Administration, Royal Eswatini Police Service, National Psychiatric Hospital, Expanded Program on Immunization and the University of Eswatini (UNESWA).

Finally, The MOH would like to thank the health workers, regional structures, and community leaders for their contributions in making this study a success. Most importantly, the study would not have been a success without the cooperation of the participants.

Senator Lizzy Nkosi
Honorable Minister of Health

SUMMARY OF KEY FINDINGS

Survey Household Characteristics

- Close to half (46.0%) of households in Eswatini had at least one HIV-positive household member.
- The percentage of households with two or more HIV-positive members (among households with at least one HIV-positive household member) was greater in rural areas (31.8%) compared with urban areas (21.3%).
- About one in three (35.3%) households had an HIV-positive head of household.

Survey Respondent Characteristics

- Nearly a tenth (9.9%) of females were widowed compared with only 1.7% of males.
- More than a tenth (12.3%) of children aged 0-14 years lived in households from the highest wealth quintile, but nearly double that percentage (26.2%) lived in households from the lowest wealth quintile.
- Nearly all (99.4%) young adolescents aged 10-14 years currently attended school.

HIV Incidence

- Using the limiting antigen (LAg) avidity assay and viral load testing algorithm, annual HIV incidence among adults aged 15 years and older was 1.36% (1.02% males, 1.70% females). This corresponds to approximately 7,300 new cases of HIV infection annually among adults aged 15 years and older.
- Using an antiretroviral (ARV)-adjusted LAg avidity testing algorithm, annual HIV incidence among adults aged 15 years and older was 1.13% (0.85% males, 1.41% females). This corresponds to approximately 6,000 new cases of HIV infection annually among adults aged 15 years and older.
- Using an ARV-adjusted LAg avidity testing algorithm, annual HIV incidence among males was highest in those aged 25-34 years (1.50%) and among females was highest in those aged 35-49 years (2.09%).

HIV Prevalence

- HIV prevalence in adults aged 15 years and older was 27.0% (20.4% males, 32.5% females). This corresponds to approximately 197,000 adults aged 15 years and older living with HIV.
- HIV prevalence peaked in males aged 45-49 years (48.8%) and in females aged 35-39 years (54.2%).
- More than half of females aged 30-44 years were living with HIV: ages 30-34 years (50.7%), ages 35-39 years (54.2%), and ages 40-44 years (51.9%).
- Three-quarters (74.6%) of widowed females aged 15-49 years were living with HIV.
- HIV prevalence was 10.9% among adults aged 65 years and older.

HIV Testing

- A large majority (87.1%) of adults aged 15 years and older had ever tested for HIV and received their test results (81.9% males, 91.4% females).
- Lifetime testing among males was lower in ages 15-19 years (61.9%) and ages 20-24 years (77.7%) and peaked in ages 45-49 years at 91.0%. Among females, lifetime testing was 90% or higher in ages 20-64 years and peaked at 99.4% in ages 30-34 years.

- One in two (51.6%) adults aged 15 years and older had tested for HIV and received their test result in the prior 12 months.
- Testing in the prior 12 months among adults aged 15 years and older was lowest in ages 15-19 years (40.6%), and highest in ages 20-24 years (63.1%) and 25-29 years (63.1%).

HIV Diagnosis and Treatment

- A majority (84.7%) of HIV-positive adults aged 15 years and older reported being aware of their HIV-positive status (77.5% males, 88.6% females).
- About three-quarters (74.1%) of adults living with HIV aged 15 years and older reported awareness of their HIV-positive status and currently being on antiretroviral therapy (ART) (68.7% males, 77.0% females).
- A large majority (95.9%) of HIV-positive adults aged 15 years and older who reported current ART use had detectable ARVs in their blood. Among those who reported as not previously diagnosed, 14.8% had detectable ARVs in their blood; 8.3% of adults who reported as previously diagnosed and not on ART had detectable ARVs in their blood.

Viral Load Suppression

- Prevalence of viral load suppression (VLS) among all HIV-positive adults aged 15 years and older was 73.1% (67.6% males, 76.0% females).
- Prevalence of VLS among HIV-positive adults aged 15 years and older who report being on ART was 91.9% (91.3% males, 92.2% females).
- VLS prevalence among all HIV-positive adults aged 15 years and older was lowest (50.6%) among those aged 15-24 years (32.9% males, 55.5% females).

90-90-90 Targets

- Based on self-report and presence of detectable ARVs, 87.0% of adults living with HIV aged 15 years and older knew their HIV status (80.1% males, 90.7% females).
- Based on self-report and presence of detectable ARVs, 88.8% of HIV-positive adults aged 15 years and older were on ART (90.2% males, 88.1% females).
- Based on self-report and presence of detectable ARVs, 91.4% of adults living with HIV aged 15 years and older had suppressed viral loads (90.5% males, 91.8% females).

Clinical Characteristics of People Living with HIV

- Less than half (44.7%) of HIV-positive adults aged 15 years and older were immunosuppressed with a CD4+ T-cell (CD4) count of less than 500 cells/microliter (µL). Severe immunosuppression with a CD4 count of less than 100 cells/µL was uncommon (2.2%).
- About two-fifths (38.9%) of adults living with HIV aged 15 years and older who reported as unaware of their HIV-positive status had a late HIV diagnosis with CD4 count less than 350 cells/µL (42.4% males, 35.0% females).
- All HIV-positive adults aged 15 years and older who initiated ART within 12 months of the survey and virtually all people living with HIV who ever initiated ART reported currently being on ART at the time of the survey (100% and 99.1%, respectively).
- Five of 28 samples (17.9%) from recently infected HIV-positive adults aged 15 years and older in the survey had mutations associated with resistance to only one class of ARVs, non-nucleoside reverse transcriptase inhibitors.

Prevention of Mother-to-Child Transmission

- Nearly all (99.4%) mothers aged 15-49 years, who delivered in the three years prior to the survey, attended at least one antenatal care (ANC) visit during their pregnancy.
- Among mothers aged 15-49 years who gave birth within the prior three years, the percentage of mothers who never breastfed and tested HIV positive (11.5%) was almost three times higher than in mothers who never breastfed and tested HIV negative (4.3%).
- Among mothers aged 15-49 years who gave birth during the 12 months prior to the survey, 98.4% reported knowing their HIV status before delivery: 30.2% were diagnosed as HIV positive before ANC, 6.4% were newly diagnosed as HIV positive in ANC, and 61.8% tested HIV negative in ANC.
- Among HIV-positive mothers aged 15-49 years who gave birth during the 12 months prior to the survey, 56.1% were on ARVs prior to pregnancy, and 34.0% were newly initiated onto ARVs during pregnancy, labor, or delivery.
- More than a tenth (12.8%) of infants aged 0-17 months, born to HIV-positive mothers aged 15-49 years in the 17 months prior to the survey, were confirmed HIV positive by virologic testing.

Young People

- Among young people aged 15-24 years, 3.5% had sex before the age of 15 years (4.5% males, 2.5% females).
- Using an ARV-adjusted LAg avidity testing algorithm, estimated annual incidence was 1.07% (95% confidence interval (CI): 0.46%-1.69%) among young people aged 15-24 years: 0.52% (95% CI: 0.00%-1.14%) males, 1.67% (95% CI: 0.62%-2.71%) females.
- HIV prevalence in young people aged 15-24 years was higher in ages 20-24 years (4.2% males, 20.9% females) than in ages 15-19 years (3.9% males, 7.2% females).
- Testing in the prior 12 months was significantly higher in ages 15-19 years in females than in males (47.9% and 33.0%, respectively) and significantly higher in ages 20-24 years in females than in males (74.2% and 51.1%, respectively).
- Among HIV-positive young people aged 15-24 years, about one-third (33.9%) were unaware of their HIV-positive status (48.5% males, 29.8% females).
- Among young people aged 15-24 years who are living with HIV, over half (54.1%) were aware of their HIV-positive status and on ART (46.8% males, 56.1% females).
- Among HIV-positive young people aged 15-24 years, half (50.6%) had suppressed viral loads (32.9% males, 55.5% females).
- Based on self-reported prior HIV diagnosis, self-reported ART use, and ARV biomarker detection in HIV-positive young people aged 15-24 years, 72.1% were classified as ARV-adjusted diagnosed; among them, 85.3% were classified as ARV-adjusted on treatment, of which 76.5% had VLS.

Children

- HIV prevalence among children aged 0-14 years was 2.8% and peaked in ages 10-14 years at 4.1%.
- Based on parent/guardian-report and presence of detectable ARVs in blood samples, 77.5% of HIV-positive children aged 0-14 years had a known HIV-positive status.
- Based on parent/guardian-report and presence of detectable ARVs in blood samples, 100.0% of HIV-positive children aged 0-14 years were on ART.
- Based on parent/guardian-report and presence of detectable ARVs in blood samples, 73.9% of HIV-positive children aged 0-14 years had VLS.

HIV Risk Behaviors

- Among adults aged 15 years and older who had sexual debut before the age of 15 years, less than a fifth (18.7%) of males were HIV positive, compared to about half (50.6%) of females.
- Among adults aged 15 years and older with two or more sexual partners in the prior 12 months, HIV prevalence was nearly double in females (45.3%) than in males (22.8%).
- Among adults aged 15 years and older who did not use a condom at last sexual intercourse in the prior 12 months, about a fifth (20.9%) were HIV positive (16.8% males, 24.1% females).
- Among adults aged 15 years and older who were living with their sexual partner and who had sex with a non-marital, non-cohabitating partner in the prior 12 months, more than half (54.5%) used a condom at last sexual intercourse. Condom use at last sexual intercourse with a non-marital, non-cohabitating partner was comparatively higher in married adults (63.7%).
- Among adult males aged 15 years and older, 70.7% reported as uncircumcised and 26.7% had received medical male circumcision. One-third (34.8%) of adult males aged 15-24 years self-reported as medically circumcised.

Intimate Partner Violence

- Among ever married or partnered (i.e. having a cohabitating partner) females aged 15 years and older, 3.6% reported intimate partner violence (IPV) in the 12 months prior to the survey. IPV peaked at 9.8% among those aged 20-24 years.
- Among ever married or partnered females aged 15-24 years, over a tenth (11.2%) experienced IPV in the 12 months prior to the survey.
- IPV was higher among ever married or partnered females aged 15 years and older testing HIV positive in the survey (5.9%), compared to those testing HIV negative in the survey (2.3%).
- Among females aged 15 years and older, 5.2% had experienced physical violence in their lifetime. Lifetime physical violence was highest among those aged 20-24 years (9.2%).

Tuberculosis

- One-third (34.8%) of self-reported adults living with HIV aged 15 years and older attended a health facility for tuberculosis (TB) services.
- A large majority (97.9%) of self-reported HIV-positive adults aged 15 years and older, who report attending TB services and a TB diagnosis, reported receipt of TB treatment.

Food and Water Security

- Across the four regions, food insecurity in the four weeks prior to the survey was higher in Shiselweni region (39.6%) and Lubombo region (35.5%).
- The percentage of households experiencing water insecurity for hygiene was more than twice as high in rural areas (15.5%) than in urban areas (6.1%).
- Food shortages occurred in more than a third (34.7%) of female-headed households compared with 26.2% of male-headed households.

1 INTRODUCTION

1.1 Background

The Population-based HIV Impact Assessment (PHIA) Project is a multicountry initiative funded by the United States 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 HIV-related parameters, including progress toward the achievement of the Joint United Nations Programme on HIV/AIDS (UNAIDS) 90-90-90 targets (UNAIDS, 2014), and will guide policy and funding priorities.

The Swaziland HIV Incidence Measurement Survey 2 2016-2017 (SHIMS2) was led by the Government of the Kingdom of Eswatini (GKOE) through the Ministry of Health (MOH) and the Central Statistical Office (CSO) and was conducted with funding from PEPFAR and technical assistance from the U.S. Centers for Disease Control and Prevention (CDC). The survey was implemented by ICAP at Columbia University in collaboration with local developmental and implementing partners. SHIMS2 2016-2017 received ethical approvals from the Eswatini National Health Research Review Board, Westat Institutional Review Board, the CDC Institutional Review Board, and the Columbia University Medical Center Institutional Review Board. SHIMS2 was a follow-on survey to the Swaziland HIV Incidence Measurement Survey (SHIMS) conducted in 2011.

1.2 Overview of SHIMS2 2016-2017

SHIMS2 2016-2017, a household-based national survey under the multicountry PHIA Project, was conducted between August 2016 and March 2017 to measure the status of Eswatini's national HIV response. SHIMS2 offered home-based testing and counseling (HBTC) with return of results and collected information about uptake of HIV care and treatment services. This survey is the second in Eswatini to measure national HIV incidence, viral load suppression (VLS) prevalence, CD4 count distribution, and transmitted HIV drug resistance. It is the first to measure pediatric HIV prevalence and presence of ARV drugs in blood. The survey also collected information on selected behaviors associated with HIV acquisition and transmission, and common HIV co-morbidities and other health conditions.

Although HIV facility-based sentinel surveillance and previously conducted population-based surveys, such as SHIMS 2011, provided useful knowledge regarding Eswatini's HIV epidemic and HIV-control efforts, information critical to understand the current status of the epidemic and guide future interventions was needed. With its focus on measuring key biological endpoints in a nationally representative sample of the population, SHIMS2 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 progress toward the achievement of the UNAIDS 90-90-90 targets.

1.3 Specific Objectives

The goal of the survey was to examine the distribution of HIV disease in Eswatini, to assess the coverage and impact of HIV services at the population level, and to measure HIV-related risk behaviors using a nationally representative sample of adults (defined in this survey as those aged 15 years and older,

unless otherwise noted) and children (defined in this survey as those aged 0-14 years, unless otherwise noted).

Primary objectives

- To estimate the national HIV incidence rate in a household-based, nationally representative sample of adults aged 15 years and older in Eswatini in 2016-2017.
- To estimate the sub-national prevalence of HIV VLS in a household-based, nationally representative sample of adults aged 15 years and older in Eswatini in 2016-2017.
- To estimate national HIV prevalence in a household-based, nationally representative sample of children aged 0 to 14 years in Eswatini in 2016-2017.

Secondary objectives

Among adults aged 15 years and older:

- To estimate national HIV prevalence in 2016-2017.
- To compare national HIV incidence estimates among those aged 18-49 years in 2011 versus 2016-2017.
- To compare national HIV incidence estimates among young women aged 18-24 years in 2011 versus 2016-2017.
- To examine correlates of incident HIV infection.
- To estimate mean population viral load (VL) among adults living with HIV.
- To compare national prevalence VLS in 2011 versus 2016-2017.
- To compare regional estimates VLS in 2011 versus 2016-2017.
- To describe the national CD4 count distribution of adults living with HIV.
- To estimate enrollment in HIV care among those with prevalent HIV infection.
- To measure the prevalence of ART use among those with prevalent HIV infection.
- To measure uptake of HIV testing and ART use among women recently pregnant or breastfeeding.
- To measure the prevalence of transmitted ARV drug resistance among those with recent HIV infection.
- To examine correlates of VLS on ART.
- To describe reported sexual behavior associated with HIV transmission risk.
- To estimate prior testing and knowledge of HIV status.
- To estimate the prevalence of MC among men.
- To measure the uptake of TB services.
- To measure the acceptability of early ART use among those who test HIV seropositive and self-report no current ART use.

Among children aged 0-14 years:

- To examine correlates of prevalent HIV infection.
- To estimate enrollment in HIV care among children living with HIV.
- To describe the national CD4 count distribution of children living with HIV.
- To describe sub-national VLS among children living with HIV.
- To measure the prevalence of ART use among those with prevalent HIV infection.
- To measure the prevalence of transmitted ARV drug resistance among those with recent HIV infection.
- To assess correlates of VLS among those on ART.
- To describe sexual debut and prevalence of sexual behavior associated with HIV transmission risk among children aged 10-14 years.
- To estimate the prevalence of MC among male children.

2 Survey Design, Methods, and Response Rates

SHIMS2 2016-2017 was a nationally representative, cross-sectional, population-based survey of households across Eswatini. Its target population corresponded to children (defined as those aged 0-14 years) and adults (defined as those aged 15 years and older, unless otherwise noted). The survey population excluded institutionalized children and adults.

2.1 Sample Frame and Design

SHIMS2 used a two-stage, stratified cluster sample design. The sampling frame was comprised of all households in the country based on the 2007 Swaziland Population and Housing Census, which includes 2,064 enumeration areas (EA), containing an estimated 212,195 households.[1] The first stage selected 286 EA (clusters) using a probability proportional to size method. The 286 EAs were stratified by four geographical regions (Hhohho, Manzini, Shiselweni, and Lubombo), with each EA defined by rural and urban status. 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 20 and the actual number of households selected per cluster ranged from 15 to 43 (Figure 2.1.A and Table 2.1.A).

The sample size was calculated to provide a representative national estimate of HIV incidence among adults aged 15-49 years with a relative standard error less than or equal to 20.0%. Representative regional estimates of VLS prevalence, among HIV-positive adults aged 15-49 years with 95% confidence intervals (CI) with ±10% bounds around the point estimates, were also used. One-half of the households were randomly selected for inclusion of children, which was designed to provide a representative national estimate of pediatric HIV prevalence with a relative standard error less than or equal to 15.0%. The target sample size was 12,042 for adults, and 3,361 for children. Appendix A, Sample Design and Weighting provides detailed explanations of the sampling and weighting processes.

Table 2.1.A Distribution of sampled enumeration areas and households, by region, SHIMS2 2016-2017

Region	Enumeration areas			Households		
	Urban	Rural	Total	Urban	Rural	Total
Hhohho	19	63	82	425	1,409	1,834
Manzini	22	72	94	492	1,610	2,102
Shiselweni	12	41	53	268	917	1,185
Lubombo	14	44	58	313	984	1,297
Total	67	220	287	1,498	4,920	6,418

2.2 Eligibility Criteria, Recruitment, and Consent Procedures

The eligible survey population included:

- Women and men aged 18 years and older living in the selected households and visitors who slept in the household the night before the survey, who were willing and able to provide written consent in either siSwati or English.
- Adolescents aged 10-17 years living in the selected households, and visitors who slept in the household the night before the survey, who were willing and able to provide written assent in either siSwati or English, and whose parents or guardians were willing and able to provide written permission for their participation in either siSwati or English.
- Children aged 0-9 years living in the selected households, and child visitors who slept in the household the night before the survey, whose parents or guardians were willing and able to provide written consent for their participation in either siSwati or English.

An electronic informed consent form was administered using a tablet computer (Appendix H). At each stage of the consent process, consent was indicated by signing or making a mark on the consent form on the tablet and on a printed copy, which was retained by the participant. A designated head of household provided written consent for household members to participate in the survey, after which individual members were rostered during a household interview. Adults and children with special circumstances (e.g., emancipated minors) provided written consent on the tablet for an interview. After completing the interview, they provided written consent for participation in the biomarker component of the survey, including HBTC, with return of HIV-testing results and CD4 counts during the household visit. Receipt of tests results was a requirement for participation in the biomarker component. If an individual did not want to receive his or her HIV test result, this was considered a refusal for the biomarker component. Adults were also asked for written consent to store their blood samples in a repository to perform additional tests in the future.

Participants aged 10-17 years were asked for assent to the interview and biomarker components after permission was granted by their parents or guardians. Parents provided consent for biomarker testing for minors below the age of assent (ages 0-9 years). Procedures with illiterate participants or participants with a sight disability involved the use of an impartial witness, chosen by the potential participant, who also signed or made a mark on the consent form on the tablet and the printed copy. If no witness could be identified, the potential participant or household (if the head of household was sight disabled or illiterate) was deemed ineligible.

2.3 Survey Implementation

Survey Governance Structure

A national Core Leadership Group (CLG) including Directors within MOH, CSO, CDC/PEPFAR and ICAP was established to provide high-level technical oversight for SHIMS2. In addition, a Technical Steering Committee (TSC) was formed to guide the process of planning and implementing this survey and to provide technical input as needed. The TSC includes representatives from the MOH, CSO, ICAP, CDC/PEPFAR, Eswatini Health Laboratory Services (EHLS), National Emergency Response Council on HIV/AIDS (NERCHA), country representation from World Health Organization (WHO), Joint United Nations Programme on HIV/AIDS (UNAIDS), United Nations Population Fund (UNFPA), United Nations Children's Fund (UNICEF), and local partners including University Research Co (URC), Elizabeth Glaser Pediatric AIDS Foundation (EGPAF), Médecins Sans Frontières (MSF), Populations Services International (PSI), Pact, Baylor, and Clinton Health Access Initiative (CHAI). A smaller operations group called the

Project Implementation Task Team (PITT) met weekly to discuss the pre-implementation, implementation, and post-implementation of data collection activities and ensure CLG and TSC direction was followed. The PITT included the Principal Investigators from MOH, CDC/PEPFAR, and ICAP in Eswatini, and members of the MOH, CDC/PEPFAR, and ICAP Project Implementation Team. ICAP partnered with Westat in the implementation of the survey to support data management.

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 subjects' protection, privacy, and confidentiality
- Blood collection for children and adults, including venipuncture and finger/heel-stick
- Home-based HIV testing and counseling
- CD4 count measurement using point-of-care Pima™ analyzer
- Referral of participants to health and social services
- Management and transportation of blood specimens
- Biosafety and waste management
- Communication skills
- Protocol deviations, adverse events, and reporting of events

Laboratory staff were trained in specimen management, including sample processing, labeling, and quality assurance (QA). Central laboratory staff were trained in VL measurement, early infant diagnosis, HIV confirmatory testing, and HIV recency testing using the LAg-Avidity enzyme immunoassay (EIA).

Survey Staff

Fieldwork started on August 30, 2016 and completed on March 31, 2017. Fieldwork was conducted by 16 locally hired field teams composed of a supervisor, six health workers, and a driver. Field teams included both male and female staff and members spoke both siSwati and English. A total of 163 regional coordinators, team supervisors, field health workers, community-mobilization coordinators, and drivers participated in data collection. Survey personnel were selected based on their qualifications and areas of expertise. The field health workers obtained consent, administered the interview, conducted phlebotomy, performed CD4 counts using a point-of-care instrument, and delivered HIV testing services (HTS) for adults and children. The field teams were managed by four regional coordinators and supervised by sixteen team supervisors, who guided and oversaw data collection activities, performed quality checks, and provided technical support.

In addition, 15 laboratory technicians processed samples and performed additional procedures for HIV-1 VL, infant virologic HIV testing, and quality control (QC) and QA. National and international monitors periodically conducted direct observation of data collection activities in the field and in the laboratories to provide technical support and ensure quality (Appendix D).

Community Sensitization and Mobilization

Community mobilization was conducted prior to data collection to maximize community support and participation in the survey at the national, regional, *inkhundla* (i.e., local administrative structure in Eswatini), and chiefdom levels. 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 prior to initiation of data collection and partnered with community health workers to meet key gatekeepers in the communities (chiefs, local government officials, and religious and community leaders). The mobilization teams consulted community leaders, held community sensitization meetings, disseminated informational materials such as brochures and posters, and held discussions with selected households and other community residents. The survey was also discussed on national radio using the established radio time slot for the MOH.

Supervision

Data-collection teams were continuously overseen by field-based supervisors and regional coordinators, as well as periodically monitored by national and international teams with representation from collaborating institutions. Monitoring teams visited field and laboratory sites at least monthly and provided direct supervision as well as verification of results by household revisits. Daily monitoring forms for household and individual outcome tracking were also reviewed by monitors for completeness. Field-based supervisors also supported teams by organizing supplies and transport of blood samples, coordinating community-mobilization efforts, providing technical troubleshooting, and checking 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, and identified and responded to challenges with data collection. Regular debriefing sessions were held between field-based supervisors and monitoring teams. Monitoring reports were circulated to collaborating institutions and the SHIMS2 PITT 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, and overall progress toward 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 Open Data Kit, an open-source mobile data collection application. The household interview collected information on household residents, assets, economic support, and recent deaths (Appendix E). The adult interview was administered to participants aged 15 years and older and included modules on demographic characteristics, sexual and reproductive health, marriage, MC, sexual activity, HIV testing and treatment history, TB and other diseases, alcohol use, and gender norms (Appendix F). The young adolescent interview was administered to participants aged 10-14 years and included modules on demographic characteristics, HIV stigma, HIV knowledge and risk perception, exposure to HIV prevention interventions, sexual activity, social norms, HIV testing and treatment history, alcohol and drug use, parental support, and violence (Appendix G). Participants who self-reported their HIV-positive status were asked questions about their HIV care experience. Parents also answered questions

about their children's (ages 0-14 years) health and participation in HTS services. In each household, one adult woman was also randomly selected to answer questions about her experiences with violence. Participants of any age who reported being victims of violence and minors who reported being victims of sexual exploitation were provided with referrals to social services. Female participants were interviewed by female staff, and male participants by male staff, whenever possible. The questionnaire was administered in the two languages most commonly used in Eswatini. The English and siSwati versions of the questionnaires were reviewed and tested thoroughly for acceptability, feasibility, and flow of questions.

2.4 Field-Based Biomarker Testing

Blood Collection

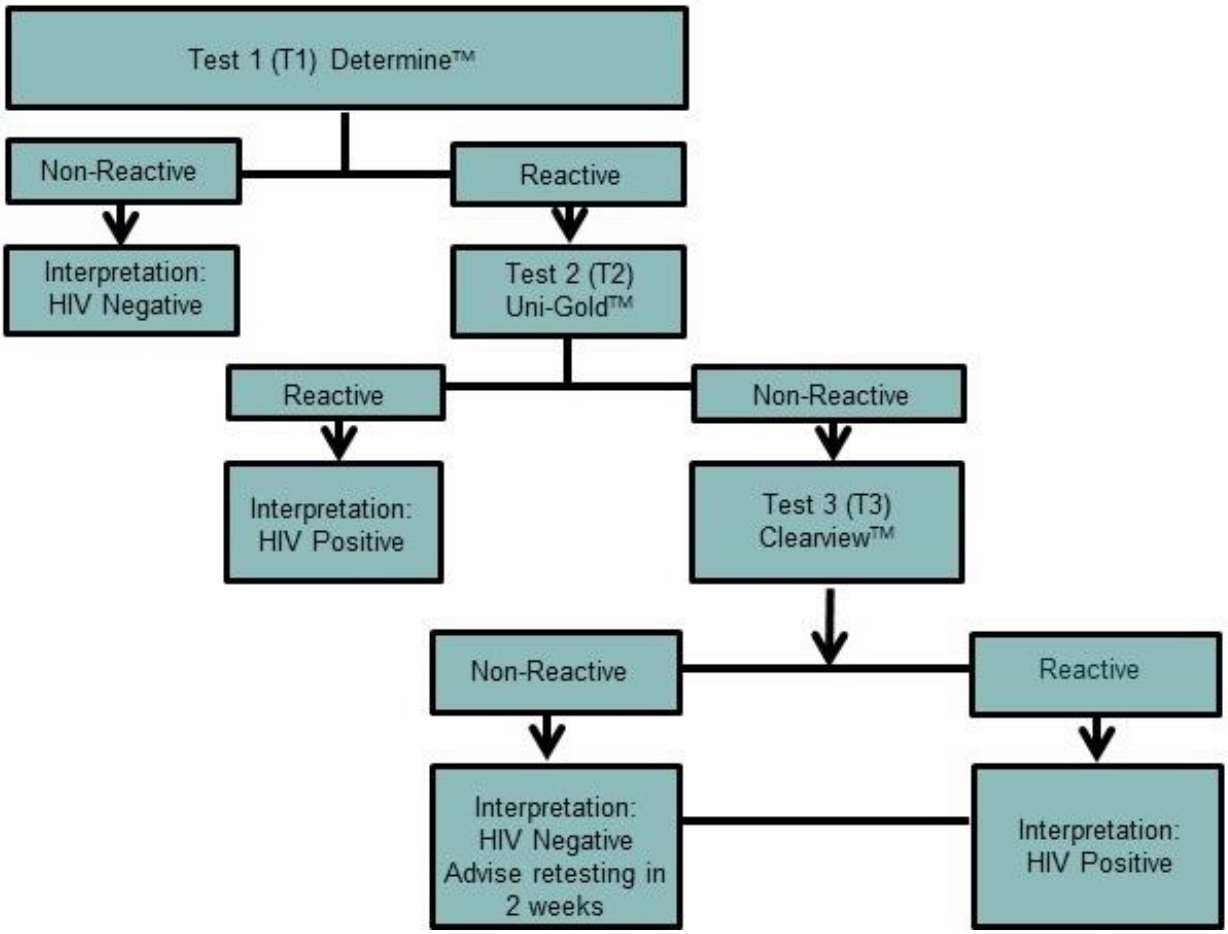
Blood was collected by qualified survey staff from consenting participants. Fourteen milliliter (mL) of venous blood was collected from adults, while six mL was collected from persons aged 2-14 years. One mL of capillary blood was collected from children aged 0-2 years, using finger-stick for children aged 6-24 months and heel-stick for children aged 6 months and under.

Blood samples were labeled with a unique bar-coded participant identification number and stored in temperature-controlled cooler boxes. At the end of each day, samples were transported to a regional hub or central laboratory for processing into plasma aliquots and dried blood spots (DBS), and were frozen within 24 hours of blood collection.

HIV Home-Based Testing and Counseling

HIV HBTC was conducted in each household based on national guidelines (Figure 2.4.A). The survey used a sequential rapid-testing algorithm in the field: Determine™ HIV-1/2 (Abbott Molecular Inc., Chicago, Illinois, United States) as a screening test, Uni-Gold™ HIV-1/2 (Trinity Biotech, Co. Wicklow, Ireland) as a confirmatory test, and Clearview™ Complete HIV-1/2 (Chembio, Medford, New York, United States) as a tiebreaker test. Individuals with a nonreactive result on the screening test were reported as HIV negative. Individuals with a reactive screening test underwent confirmatory testing. Those with reactive results on both the screening and confirmatory tests were classified as HIV positive. Individuals with a reactive screening test result, followed by a nonreactive confirmatory test result, underwent tiebreaker testing. Individuals with a reactive tiebreaker test result were classified as HIV positive. Those with a nonreactive tiebreaker test result were classified as HIV negative.

Figure 2.4.A Household-based HIV-testing algorithm, SHIMS2 2016-2017



HIV-seropositive participants who reported not being on ART were referred to HIV care and treatment services at a health facility of their choice. For children, results were returned to a parent or guardian. Participants with a nonreactive tiebreaker test result were advised to attend a facility in two weeks for repeated testing, as per national guidelines.

For children aged 18 months or less, only the screening test (Determine™) was performed in the field. If the test was reactive, HIV total nucleic acid (TNA) polymerase chain reaction (PCR) for virologic testing of HIV infection was performed in the reference laboratory, as described below (Section 2.5).

For participants who reported being HIV positive, but who tested HIV negative at the time of the survey, additional laboratory-based testing was conducted using HIV TNA PCR for confirmation of the status. In conjunction with the MOH, survey staff revisited these participants and health providers to provide counseling and guidance on next steps to confirm these results, particularly for those on ART.

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

CD4 T-Cell Count Measurement

All participants who tested HIV positive during HBTC, and a random sample of 2.0% of those who tested HIV negative, received a CD4 count measurement in the field by qualified survey staff. The measurement was performed using the Pima™ CD4 Analyzer (Abbott Molecular Inc., Chicago, Illinois, United States, formerly Alere).

HIV linkage to care

Participants were eligible for linkage to care (LTC) services if they tested HIV positive during HBTC at the time of their interview and reported as either: newly diagnosed with HIV, having initiated ART but had not visited a clinic in the prior three months, or having never initiated ART.

LTC teams visited facilities selected by the participant for referral to HIV care. Jointly working with health facility staff, LTC teams identified LTC-eligible participants by the facility copy of the referral form and supported facility staff to telephone participants to encourage attendance at the clinic. When referral forms did not indicate consent for future contact or no phone number, a call was not placed to the participant. If a participant was not reachable by phone and had consented to contact by home visit, a home visit was conducted.

Once contacted, participants were asked a series of questions to identify their prior experience with linkage to HIV services. If a participant had not yet linked to care, they were encouraged to do so with additional counseling messages and the facility staff or SHIMS2 LTC staff would schedule an appointment with the participant. Those who had linked prior to contact by the LTC team were also encouraged to make an appointment to receive their HIV VL results at the facility.

2.5 Laboratory-Based Biomarker Testing

Central Laboratory Procedures

A central laboratory for the survey was established within the existing national reference laboratory. Trained technicians performed processing of whole blood specimens into plasma aliquots and DBS cards for storage at -20°C, testing for QA, and HIV confirmatory testing. For QA of the HIV rapid testing conducted in the field, the first 50 samples tested by each field tester, and subsequently a random sample of 5.0% of all specimens, were retested in the laboratory using the national HIV rapid-testing algorithm. All specimens that received confirmatory testing and tested nonreactive during HBTC underwent a second confirmatory test using Geenius HIV 1/2 Supplemental Assay (Bio-Rad, Hercules, California, United States). A positive Geenius result defined HIV-positive status. Central laboratory procedures included HIV VL testing, HIV TNA PCR for infant virologic testing and to confirm the status of those who self-reported an HIV-positive status but tested negative in HBTC, HIV recency testing, and long-term storage of samples at -80°C.

Survey staff 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.

Viral Load Testing

The HIV-1 VL (HIV Ribonucleic acid (RNA) copies per mL) of confirmed HIV-positive participants was measured at the central laboratory using the Roche COBAS® AmpliPrep/COBAS® TaqMan® HIV-1 Test, version 2.0 (Roche Molecular Diagnostics, Indianapolis, Indiana, United States). The open-mode protocol

for the Roche COBAS Ampliprep/TaqMan HIV-1 Assay was used to prepare samples for amplification. The Abbott m2000 System (Abbott Molecular Inc., Chicago, Illinois, United States) was used to conduct DBS VL testing at the National Institute for Communicable Diseases (NICD) in Johannesburg, South Africa, when testing was unavailable at the central laboratory. The Abbott m2000 System consists of two separate instruments, the m2000sp (which carries out automated extraction, purification, and preparation of HIV-1 RNA), and the m2000rt (which amplifies, detects, and measures the HIV-1 RNA load). For plasma, the 0.6 mL protocol was used, while the open-mode protocol for the Abbott RealTime HIV-1 assay was used to measure VL from DBS samples from children and adults with insufficient volume of plasma.

VL results were returned within six to eight weeks to the health facility chosen by each HIV-positive participant. The duration and completion for returning results was monitored through internal quality assurance systems and managed by designated study staff. Participants were provided with a referral form during HBTC for subsequent retrieval of their results. Survey staff also contacted each participant via Short Message Service (SMS) to inform them that their VL results were available at the chosen facility and to further advise them to seek care and treatment.

Infant HIV Virological Testing

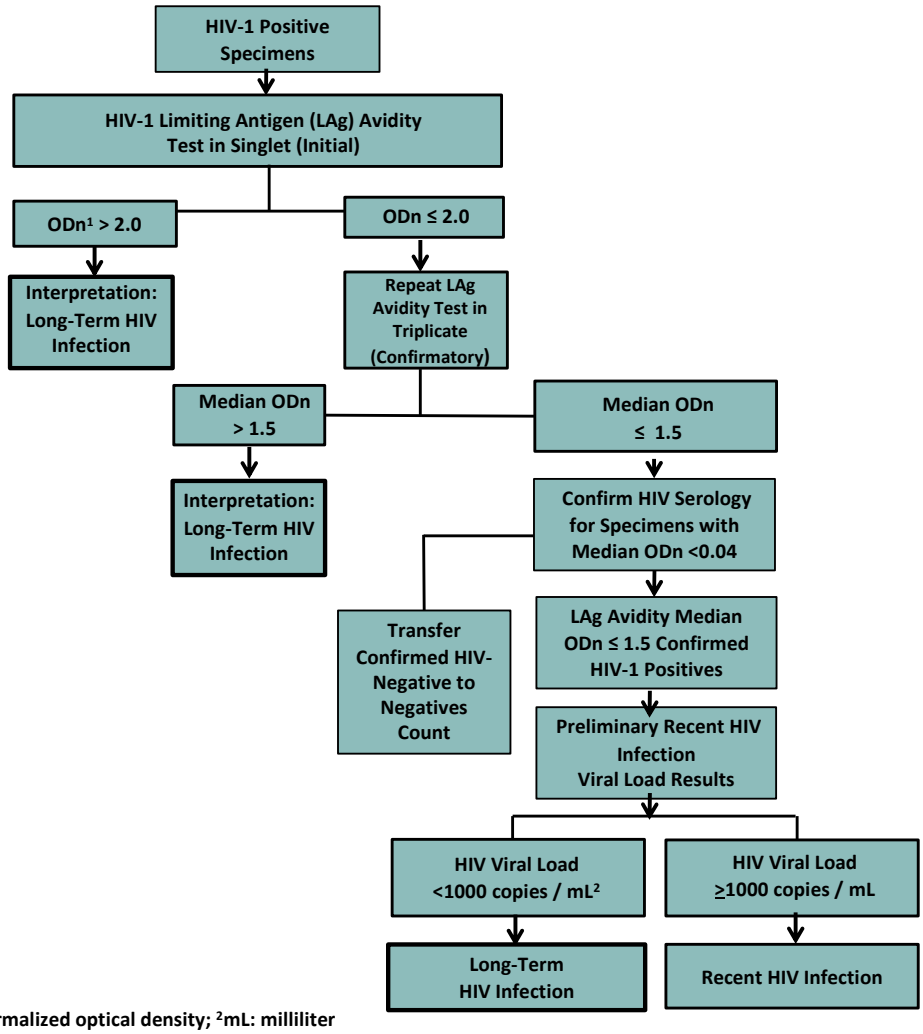
For infants aged 18 months and under who screened positive for HIV during HBTC, virologic testing was conducted via HIV TNA PCR using the COBAS® AmpliPrep/COBAS® TaqMan® 96 analyzer using the COBAS® Ampliprep/COBAS TaqMan® HIV-1 Qualitative Test, version 2.0 (Roche Molecular Diagnostics, Branchburg, New Jersey, United States). Results were returned to the health facility selected by the infant's parent or guardian within six to eight weeks, and survey staff also contacted the parent or guardian via telephone to inform them that the infant's results were available at the facility.

HIV Recent Infection Testing Algorithm

To distinguish recent from long-term HIV infections, the survey used two different laboratory-based testing algorithms. Each algorithm employed a combination of assays: 1) HIV-1 LAg-Avidity EIA (Sedia Biosciences Corporation, Portland, Oregon, United States) and VL (Figure 2.5.A) and 2) HIV-1 LAg-Avidity EIA, VL, and ARV detection (Figure 2.5.B), as described in Appendix B.

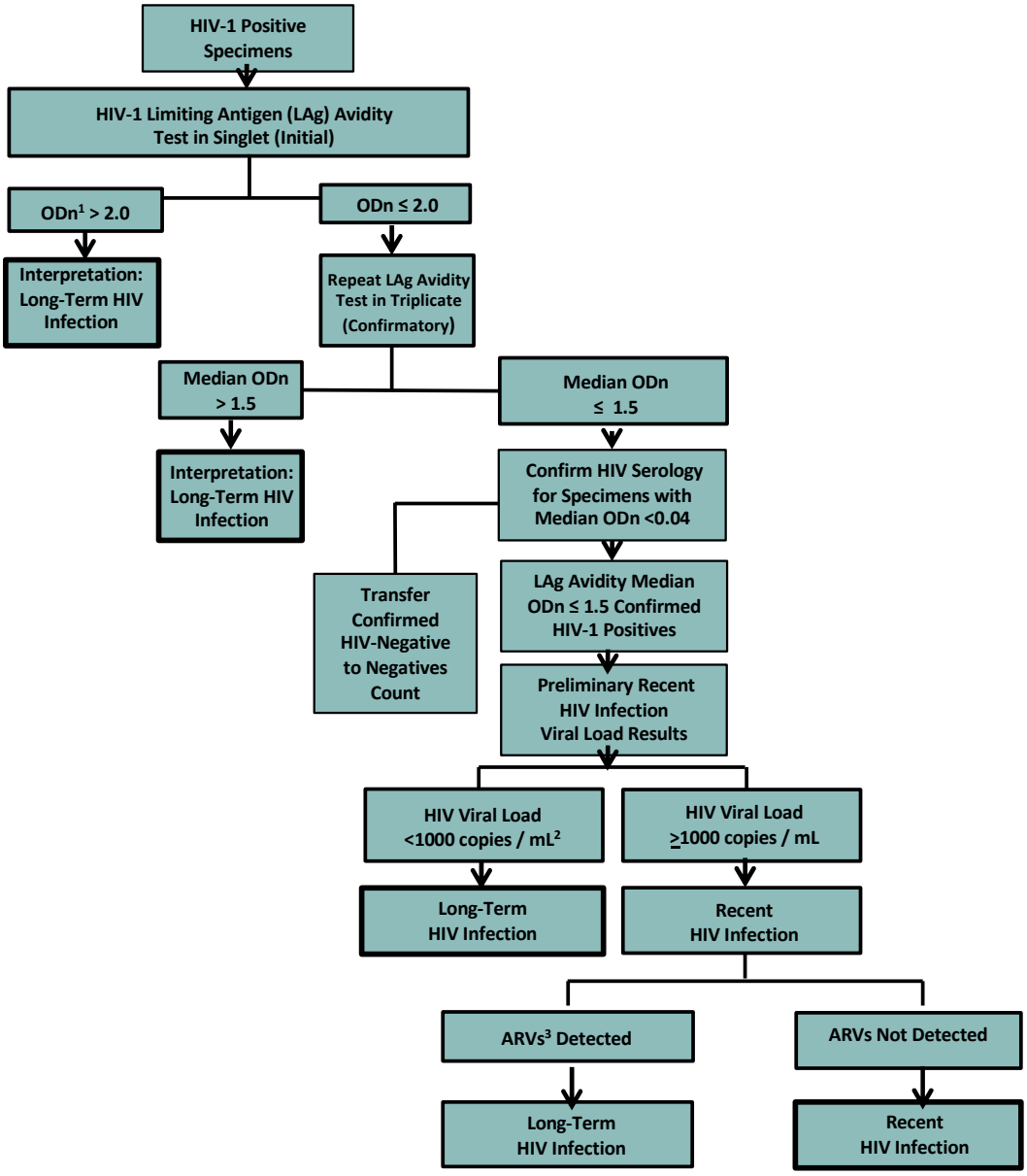
Specimens with median normalized optical density ≤1.5 were classified as potential recent infections, and their VL results were assessed. Specimens with VL < 1,000 copies/mL were classified as long-term infections, while those with VL ≥ 1,000 copies/mL were classified as recent infections (Figure 2.5.A). In the ARV-adjusted algorithm, specimens with VL ≥ 1,000 copies/mL and with detectable ARVs were classified as long-term infections. Specimens with VL ≥ 1,000 copies/mL and without detectable ARVs were classified as recent infections (Figure 2.5.B).

Figure 2.5.A HIV-1 recent infection testing algorithm (LAg/viral load), aged 18 months and older, SHIMS2 2016-2017



[1]ODn: normalized optical density; [2]mL: milliliter

Figure 2.5.B HIV-1 recent infection testing algorithm (LAg/viral load/ARV), aged 18 months and older, SHIMS2 2016-2017



[1]ODn: normalized optical density; [2]mL: milliliter; [3]ARVs: antiretrovirals

Detection of Antiretroviral Drug Resistance

HIV resistance to ARVs was assessed for all those HIV-positive participants 18 months and older, classified as recent HIV infections, and a small subset of confirmed long-term infections. In addition, all infants less than the age of 18 months with confirmed infection were evaluated to determine vertical transmission of ARV-resistant HIV. Mutations in the HIV protease and reverse transcriptase genes that confer ARV drug resistance (according to the Stanford drug resistance database) were detected simultaneously by use of the CDC in-house multiplex allele-specific drug resistance assay.

Specimens were sent to CDC in the United States where testing was performed at the International Laboratory Branch, a WHO-accredited laboratory for drug resistance testing.

Detection of Antiretrovirals

Qualitative screening for detectable concentrations of ARVs was conducted on DBS specimens from all HIV-positive adults and children, 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 microgram (µg)/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, three ARVs were selected as markers for the most commonly prescribed first and second line regimens: efavirenz, lopinavir, and nevirapine. These ARVs were also selected based on their relatively long half-lives, allowing for a longer period of detection following intake.

Detection of ARVs is considered indicative of participant use of a given drug at the time of blood collection. Results below the limit of detection among individuals who reported ARV use indicate that there was no recent exposure to the regimen or that adherence to a prescribed regimen is sub-optimal, 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 Division of Clinical Pharmacology of the Department of Medicine at the University of Cape Town in South Africa.

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 are adjusted for nonresponse and noncoverage. Nonresponse adjusted weights were calculated for households, individual interviews, and individual blood draws in a hierarchical form. Adjustment for nonresponse for initial individual and blood-level weights was based on the development of weighting adjustment cells, defined by a combination of variables that are potential predictors of response and HIV status. The nonresponse adjustment cells were constructed using chi-square automatic interaction detection 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 five-year age groups.

Descriptive analyses of response rates, characteristics of respondents, HIV prevalence, CD4 count distribution, HIV testing, self-reported HIV status, self-reported ART, VLS, prevention of mother-to-child transmission (PMTCT) indicators, and sexual behavior 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 VL algorithm or with the HIV-1 LAg avidity plus VL and ARV algorithm, and obtained using the CDC Incidence Calculator, which uses the formula recommended by the WHO Technical Working Group on HIV Incidence Assays and the Consortium for the Evaluation and Performance of HIV Incidence Assays, with time cutoff (T) = 1.0 year and residual proportion false recent (PFR) = 0.00. 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 SHIMS2 was not powered to estimate incidence at the regional level or across different sub-groups.

2.7 Response Rates

Using the American Association for Public Opinion Research Response Rate 4 method,[3] household response rates were calculated using the number of complete and incomplete household interviews among all eligible households and the number estimated to be eligible among households 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 response rates were calculated as the number of individuals who were interviewed divided by the number of individuals eligible to participate in the survey. Blood draw response rates for adults were calculated as the number of individuals who provided blood, divided by the number of individuals who were interviewed. Blood draw response rates for children were calculated as the number of individuals who provided blood, divided by the number of individuals eligible to participate in the biomarker component of the survey.

Of the 6,417 selected households, 6,056 and 5,185 were occupied and interviewed, respectively. The overall household response rate (unweighted) was 84.9% (79.3% in urban areas and 87.2% in rural areas). After adjusting for differential sampling probabilities and nonresponse, the overall weighted household response rate was 84.5% (79.1% in urban areas and 87.1% in rural areas) (Table 2.7.A).

A total of 12,857 adults (5,648 males and 7,209 females) were eligible to participate in the survey. Interview response rates (unweighted) were 86.8% for males and 93.9% for females. Among those adults who were interviewed, 91.9% of males and 95.0% of females (unweighted) also had their blood drawn.

Children in half of the selected households were eligible for blood draw. Of the 2,697 eligible children aged 0-9 years, 82.7% of males and 81.8% of females (unweighted) had their blood drawn. Of the 1,300 eligible children aged 10-14 years, interview response rates (unweighted) were 88.9% of males and 92.5% of females. Among 10-14-year-olds interviewed, 98.3% of males and 97.5% of females (unweighted) had their blood drawn (Table 2.7.B).

Table 2.7.A Household response rates

Number of households selected, occupied, and interviewed and household response rates (unweighted and weighted), by residence, SHIMS2 2016-2017

Result	Residence		Total
	Urban	Rural	
Household interviews			
Households selected	1,863	4,554	6,417
Households occupied	1,757	4,299	6,056
Households interviewed	1,408	3,777	5,185
Household response rate[1] (unweighted)	79.3	87.2	84.9
Household response rate[1] (weighted)	79.1	87.1	84.5

[1]Household response rate was calculated using the American Association for Public Opinion Research (AAPOR) Response Rate 4 (RR4) method: http://www.aapor.org/AAPOR_Main/media/publications/Standard-Definitions20169theditionfinal.pdf

Table 2.7.B Interviews and blood draw response rates

Number of eligible individuals and response rates for individual interviews[1] and blood draws[2] (unweighted and weighted), by residence and sex, SHIMS2 2016-2017

	Residence					
	Urban		Rural		Total	
Result	Males	Females	Males	Females	Males	Females
Eligible individuals, aged 0-9 years						
Number of eligible individuals	199	200	1,139	1,159	1,338	1,359
Blood draw response rate (unweighted)	74.4	73.0	84.1	83.3	82.7	81.8
Blood draw response rate (weighted)	74.3	75.4	83.8	82.8	82.0	81.4
Eligible individuals, aged 10-14 years						
Number of eligible individuals	79	78	580	563	659	641
Interview response rate (unweighted)	82.3	87.2	89.8	93.3	88.9	92.5
Interview response rate (weighted)	83.5	88.4	89.7	92.7	88.7	92.0
Blood draw response rate (unweighted)	100.0	92.6	98.1	98.1	98.3	97.5
Blood draw response rate (weighted)	100.0	92.1	97.9	97.9	98.2	97.0
Eligible individuals, aged 15-24 years						
Number of eligible individuals	332	434	1,721	1,735	2,053	2,169
Interview response rate (unweighted)	88.0	92.4	86.6	93.0	86.8	92.9
Interview response rate (weighted)	88.2	93.0	86.6	92.8	86.9	92.8
Blood draw response rate (unweighted)	89.0	93.3	94.9	96.2	93.9	95.6
Blood draw response rate (weighted)	89.6	93.4	95.0	96.1	94.0	95.4
Eligible individuals, aged 15-49 years						
Number of eligible individuals	1,090	1,301	3,549	4,224	4,639	5,525
Interview response rate (unweighted)	87.3	92.2	85.5	93.7	86.0	93.4
Interview response rate (weighted)	87.3	92.5	85.4	93.6	85.9	93.3
Blood draw response rate (unweighted)	88.4	91.7	92.7	95.4	91.6	94.6
Blood draw response rate (weighted)	88.2	92.0	92.6	95.3	91.4	94.3
Eligible individuals, aged 15 years and older						
Number of eligible individuals	1,255	1,536	4,393	5,673	5,648	7,209
Interview response rate (unweighted)	87.6	92.3	86.6	94.3	86.8	93.9
Interview response rate (weighted)	87.6	92.5	86.4	94.2	86.7	93.7
Blood draw response rate (unweighted)	88.2	91.3	93.0	95.9	91.9	95.0
Blood draw response rate (weighted)	87.9	91.7	92.9	95.8	91.6	94.7

[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

2.8 References

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3 SURVEY HOUSEHOLD CHARACTERISTICS

3.1 Key Findings

- Close to half (46.0%) of households in Eswatini had at least one HIV-positive household member.
- The percentage of households with two or more HIV-positive members (among households with at least one HIV-positive household member) was greater in rural areas (31.8%) compared with urban areas (21.3%).
- About one in three (35.3%) households had an HIV-positive head of household.

3.2 Background

This chapter describes the characteristics of households surveyed in SHIMS2. 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 (i.e., persons who slept in the household the night before) 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.

3.3 Household Composition

More than half (54.5%) of households in Eswatini were female-headed (48.9% in urban areas and 57.2% in rural areas). The median household size was four persons (interquartile range (IQR): 2-6), with a median of two persons (IQR: 1-4) in urban households and four persons (IQR: 2-6) in rural households. The median number of children under 18 years of age in the household was one (IQR: 0-3), with a median of zero (IQR: 0-2) in urban households and two (IQR: 0-3) in rural households (Table 3.3.A).

Children under the age of 15 years comprised 36.6% (18.2% males and 18.4% females) of the *de facto* household population, those aged 15-49 years constituted 50.5% (22.9% males and 27.6% females), and those aged 50 years and older constituted 12.9% (4.7% males and 8.2% females; Table 3.3.B; Figure 3.3.A).

The population in rural areas was younger than in urban areas (39.4% of the rural population was aged 0-14 years compared with 27.6% of the urban population). In urban areas, 62.2% of the population was aged 15-49 years versus 46.9% of the population in rural areas. Adults aged 50 years and older comprised a similar percentage of the population in rural areas (13.7%) and urban areas (10.2%; Table 3.3.C; Figure 3.3.B).

Table 3.3.A Household composition

Percent distribution of households by sex of head of household; median size of household and median (Q1[1], Q3[2]) number of children 18 years of age, by residence, SHIMS2 2016-2017

	Residence					
	Urban		Rural		Total	
Characteristic	Percent	Number	Percent	Number	Percent	Number
Household headship						
Male	51.1	737	42.8	1,619	45.5	2,356
Female	48.9	671	57.2	2,158	54.5	2,829
Total	100.0	1,408	100.0	3,777	100.0	5,185

	Residence					
	Urban		Rural		Total	
Characteristic	Median	Q1, Q3	Median	Q1, Q3	Median	Q1, Q3
Size of households	2	(1, 4)	4	(2, 6)	4	(2, 6)
Number of children below 18 years of age	0	(0, 2)	2	(0, 3)	1	(0, 3)

[1] Q1: quartile one
[2] Q3: quartile three

Table 3.3.B Population pyramid

Distribution of the de facto household population, by five-year age groups and sex, SHIMS2 2016-2017

	Males		Females		Total	
Age	Percent	Number	Percent	Number	Percent	Number
0-4	6.1	1,250	6.2	1,277	12.3	2,527
5-9	6.1	1,284	6.4	1,346	12.5	2,630
10-14	6.0	1,257	5.8	1,224	11.8	2,481
15-19	5.8	1,218	5.6	1,148	11.4	2,366
20-24	4.1	839	5.1	1,025	9.2	1,864
25-29	3.8	754	4.7	922	8.4	1,676
30-34	3.3	650	4.3	867	7.6	1,517
35-39	2.7	536	3.3	646	6.0	1,182
40-44	1.8	366	2.4	479	4.3	845
45-49	1.4	286	2.2	445	3.6	731
50-54	1.1	234	2.0	397	3.1	631
55-59	1.0	211	1.6	323	2.6	534
60-64	0.9	194	1.5	316	2.4	510
65-69	0.7	147	1.0	203	1.7	350
70-74	0.5	94	1.0	203	1.4	297
75-79	0.3	74	0.5	112	0.9	186
≥80	0.2	55	0.6	130	0.8	185
Total	45.9	9,449	54.1	11,063	100.0	20,512

Figure 3.3.A Distribution of the de facto population by sex and age, SHIMS2 2016-2017

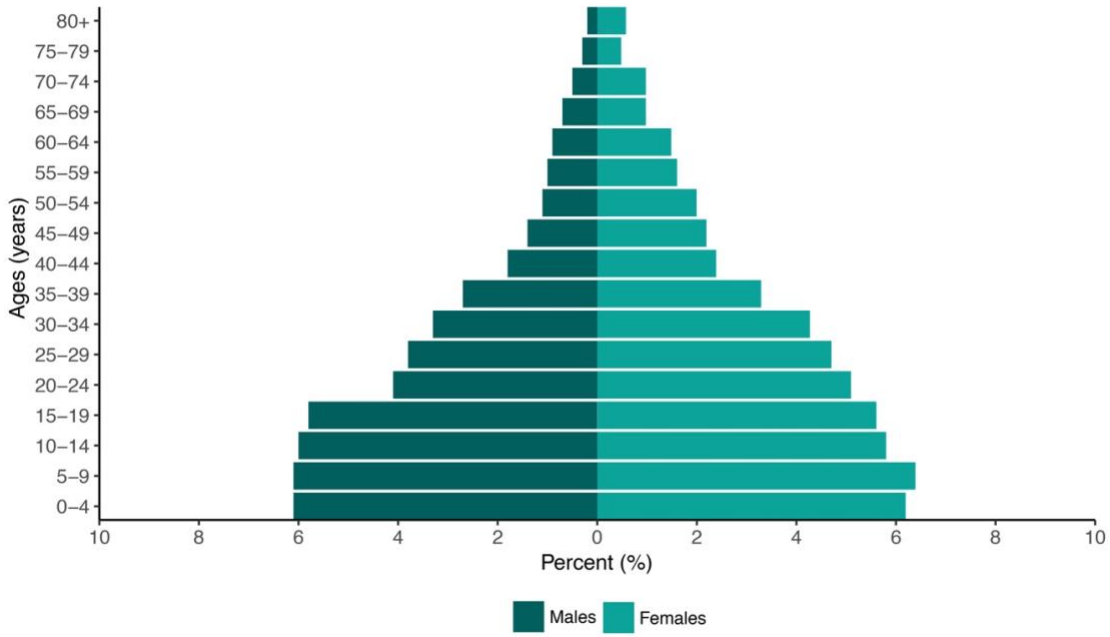


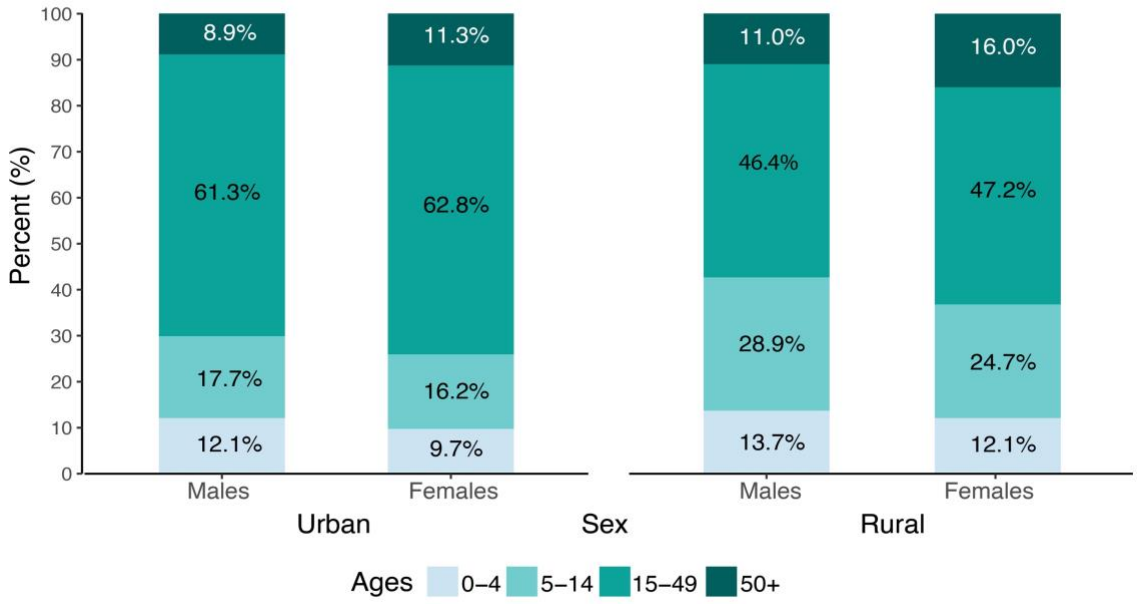
Table 3.3.C Distribution of de facto household population by age, sex, and residence

Percent distribution of the de facto household population, by sex, age, and residence, SHIMS2 2016-2017

	Urban					
	Males		Females		Total	
Age	Percent	Number	Percent	Number	Percent	Number
0-4	12.1	206	9.7	194	10.8	400
5-14	17.7	312	16.2	333	16.8	645
15-49	61.3	1,094	62.8	1,303	62.2	2,397
≥50	8.9	165	11.3	235	10.2	400
Total	100.0	1,777	100.0	2,065	100.0	3,842

	Rural					
	Males		Females		Total	
Age	Percent	Number	Percent	Number	Percent	Number
0-4	13.7	1,044	12.1	1,083	12.8	2,127
5-14	28.9	2,229	24.7	2,237	26.6	4,466
15-49	46.4	3,555	47.2	4,229	46.9	7,784
≥50	11.0	844	16.0	1,449	13.7	2,293
Total	100.0	7,672	100.0	8,998	100.0	16,670

Figure 3.3.B Household population by age, sex, and residence, SHIMS2 2016-2017



3.4 Prevalence of HIV-Affected Households

In Eswatini, 46.0% of households had at least one HIV-positive member. The distribution was similar for urban households (45.1%) and rural households (46.5%; Table 3.4.A; Figure 3.4.A). Among these HIV-affected households, 71.4% had one HIV-positive member, 23.1% had two HIV-positive members, and 4.3% had three HIV-positive members. The distribution of the number of HIV-positive household members varied by urban and rural residence. Among households with at least one HIV-positive member, the percentage of households with one HIV-positive member was greater in urban areas (78.7%) than in rural areas (68.2%). In contrast, the percentage of households with at least two HIV-positive members was larger in rural areas (25.5% with two HIV-positive members and 6.3% with three or more HIV-positive members) than in urban areas (17.8% with two HIV-positive members and 3.5% with three or more HIV-positive members; Table 3.4.B; Figure 3.4.B).

About one in three (35.3%) households in the country had an HIV-positive head of household. A greater percentage of female-headed households than of male-headed households have the head of the household living with HIV (37.8% of female household heads were HIV-positive versus 31.9% of male household heads; Table 3.4.C).

Table 3.4.A Prevalence of HIV-affected households

Percentage of households with at least one household member who tested HIV-positive, by residence, SHIMS2 2016-2017

Residence	Percent	Number
Urban	45.1	1,283
Rural	46.5	3,640
Total	46.0	4,923

Figure 3.4.A Prevalence of HIV-affected households by residence, SHIMS2 2016-2017

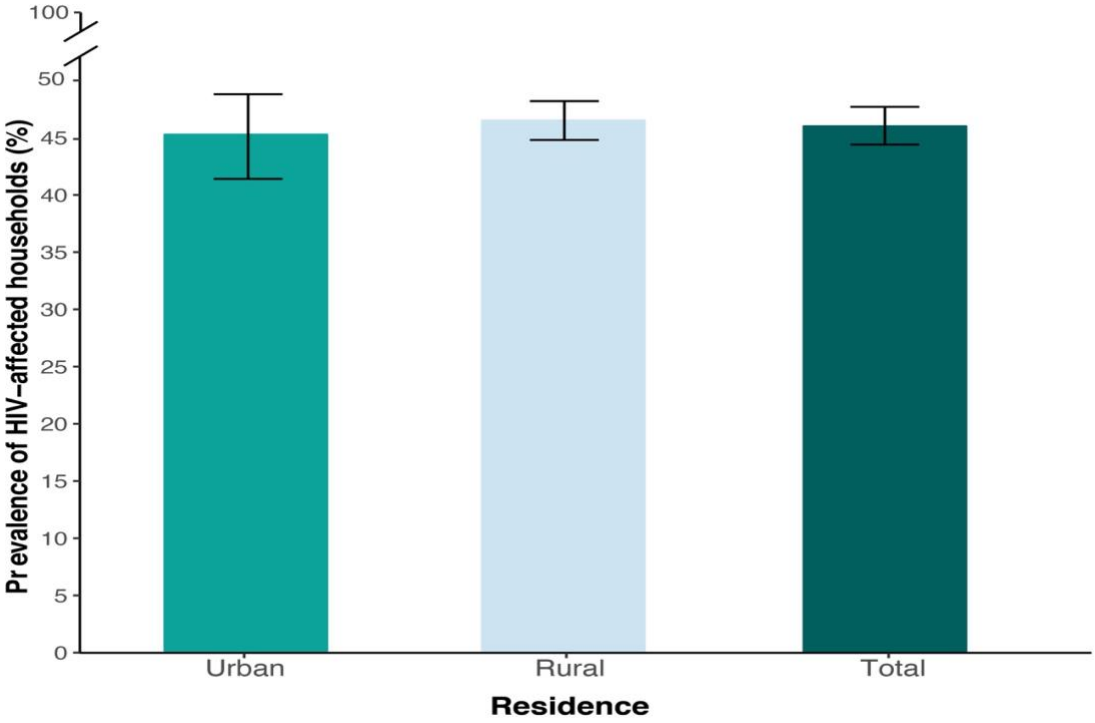


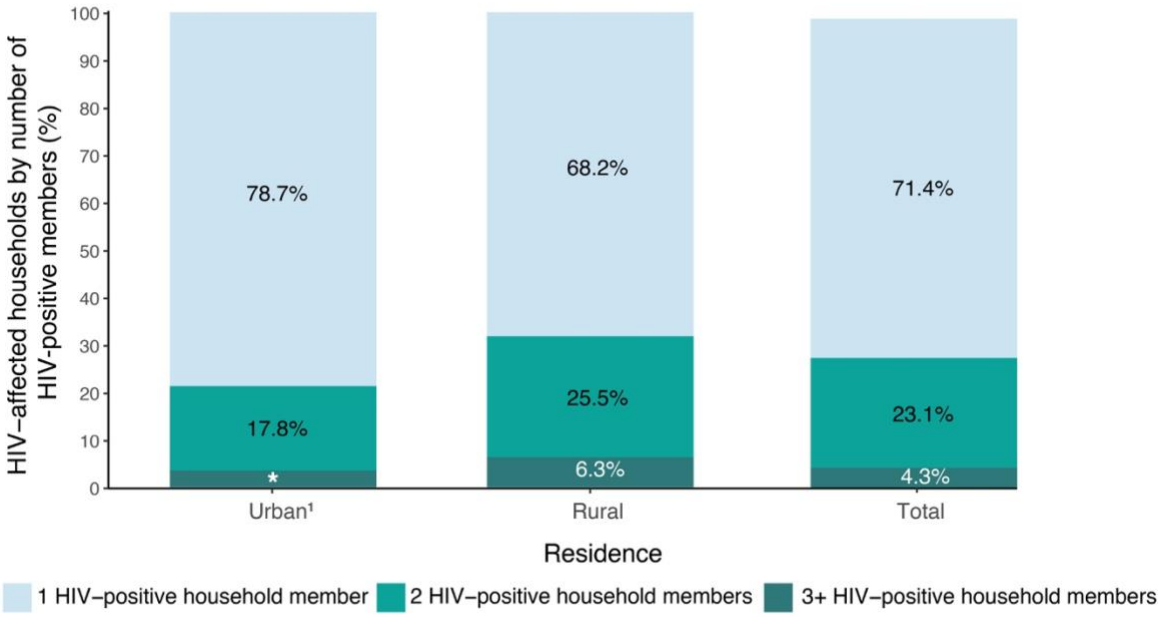
Table 3.4.B HIV-affected households by number of HIV-positive members

Among households with at least one HIV-positive household member, percent distribution of households by number of HIV-positive household members, by residence, SHIMS2 2016-2017

	Residence					
	Urban		Rural		Total	
Number of HIV-positive household members	Percent	Number	Percent	Number	Percent	Number
1	78.7	452	68.2	1,153	71.4	1,605
2	17.8	106	25.5	432	23.1	538
3	*	17	5	82	4.3	99
4	*	2	*	18	*	20
5	*	0	*	4	*	4
≥6	*	2	*	1	*	3
Total	100.0	579	100.0	1,690	100.0	2,269

Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed.

Figure 3.4.B HIV-affected households by number of HIV-positive members and residence, SHIMS2 2016-2017



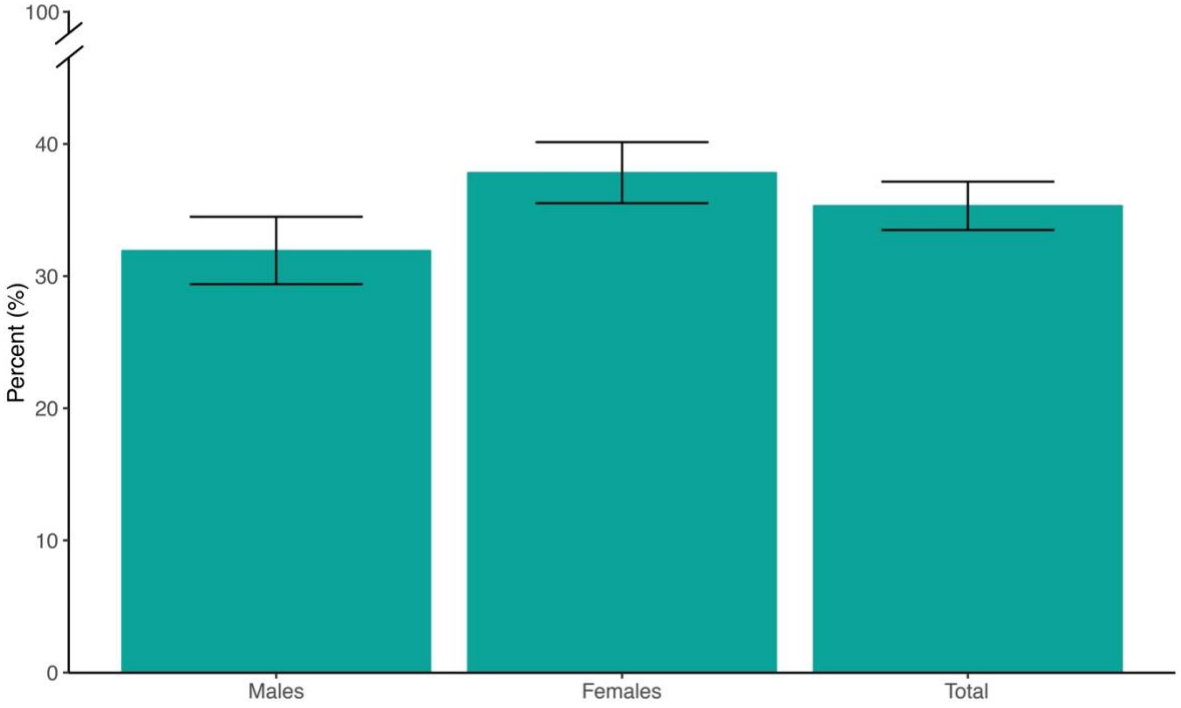
*An asterisk indicates that an estimate is based on a very small number (less than 25) of unweighted cases and has been suppressed.

Table 3.4.C 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, SHIMS2 2016-2017

Sex of head of household	Percent	Number
Male	31.9	1,925
Female	37.8	2,593
Total	35.3	4,518

Figure 3.4.C Prevalence of households with an HIV-positive head of household by sex, SHIMS2 2016-2017



4 SURVEY RESPONDENT CHARACTERISTICS

4.1 Key Findings

- Nearly a tenth (9.9%) of females were widowed compared with only 1.7% of males.
- More than a tenth (12.3%) of children aged 0-14 years lived in households from the highest wealth quintile, but nearly double that percentage (26.2%) lived in households from the lowest wealth quintile.
- Nearly all (99.4%) young adolescents aged 10-14 years currently attended school.

4.2 Background

SHIMS2 assessed key indicators and outcomes for children, adolescents, and adults. To provide context for these outcomes, this chapter summarizes the basic demographic and socioeconomic characteristics of survey respondents. In this report, most key indicators are stratified according to these characteristics.

4.3 Demographic Characteristics of the Adult Population

In Eswatini, almost three-quarters (73.0%) of adults (defined in this survey as those aged 15 years and older, unless otherwise noted) lived in rural areas. About half (51.8%) of adults had never married. Never being married was more common among males (58.3%) than females (46.4%). In contrast, females were more likely to be widowed (9.9% of females versus 1.7% of males). A third of the population (34.8%) lived in Manzini, compared to roughly half of that in Lubombo (18.7%) and Shiselweni (16.7%). Only 2.9% of the adult population was in a polygynous union. Nearly equal proportions of the population had attended primary (27.5%), secondary (28.5%), and high school (28.1%) levels of education, while only 5.5% of the population had no education. Wealth quintile was similarly distributed across the male, female, and total adult population (Table 4.3.A).

Table 4.3.A Demographic characteristics of the adult population

Percent distribution of the population aged 15 years and older by sex and other selected demographic characteristics, SHIMS2 2016-2017

	Males		Females		Total	
Characteristic	Percent	Number	Percent	Number	Percent	Number
Residence						
Urban	26.9	1,100	27.1	1,418	27.0	2,518
Rural	73.1	3,804	72.9	5,351	73.0	9,155
Region						
Hhohho	30.7	1,536	29.0	1,998	29.8	3,534
Lubombo	19.5	1,017	18.1	1,314	18.7	2,331
Manzini	33.7	1,497	35.6	2,161	34.8	3,658
Shiselweni	16.1	854	17.3	1,296	16.7	2,150
Marital status						
Never married	58.3	2,772	46.4	2,925	51.8	5,697
Married	31.3	1,596	34.3	2,334	32.9	3,930
Living together	5.1	228	4.9	301	5.0	529
Divorced/separated	3.6	181	4.5	290	4.1	471
Widowed	1.7	99	9.9	885	6.1	984
Type of union						
In polygynous union	1.9	110	3.8	293	2.9	403
Not in polygynous union	33.3	1,672	32.6	2,176	32.9	3,848
Not currently in union	63.3	3,052	60.5	4,100	61.7	7,152
Don't know/missing	1.5	70	3.1	200	2.4	270
Education						
No education	4.8	276	6.0	539	5.5	815
Primary	28.7	1,496	26.4	1,985	27.5	3,481
Secondary	25.9	1,294	30.7	2,005	28.5	3,299
High school	29.9	1,373	26.7	1,625	28.1	2,998
Tertiary	10.7	458	10.2	600	10.4	1,058
Wealth quintile						
Lowest	20.7	1,093	21.0	1,590	20.9	2,683
Second	20.3	1,042	20.2	1,433	20.2	2,475
Middle	23.2	1,153	22.7	1,598	23.0	2,751
Fourth	17.3	797	17.6	1,070	17.4	1,867
Highest	18.5	818	18.4	1,076	18.5	1,894
Age						
15-19	19.0	1,074	16.2	1,064	17.5	2,138
20-24	17.8	709	15.8	950	16.7	1,659
25-29	15.1	642	14.2	861	14.6	1,503
30-34	11.7	541	12.4	811	12.1	1,352
35-39	8.9	453	10.5	602	9.8	1,055
40-44	6.5	323	8.1	450	7.4	773
45-49	5.2	246	6.4	420	5.9	666
50-54	4.1	214	4.8	379	4.5	593
55-59	3.3	188	3.7	309	3.5	497
60-64	2.8	176	2.6	304	2.7	480
65+	5.4	338	5.2	619	5.3	957
Total 15-24	36.9	1,783	31.9	2,014	34.2	3,797
Total 15-49	84.3	3,988	83.6	5,158	83.9	9,146
Total 15+	100.0	4,904	100.0	6,769	100.0	11,673

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.
The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

4.4 Demographic Characteristics of the Pediatric Population

Among children (defined in this survey as those aged 0-14 years, unless otherwise noted), 9.8% were under the age of 18 months. More than a third (36.5%) were 0-4 years of age. The majority (81.8%) of children lived in rural areas. Nearly a third (31.9%) lived in Manzini, while close to a fifth (19.3%) lived in Shiselweni. Lower wealth is more common among children: A quarter (26.2%) lived in households from the lowest wealth quintile, while less than half that percentage (12.3%) lived in households from the highest wealth quintile (Table 4.4.A). Differences in distribution between males and females were minimal across age, residence, region, and wealth quintile. Among adolescents aged 10-14 years, nearly all (99.4%) currently attended school. Over three-quarters (77.4%) currently attended higher primary school (73.6% of males and 81.2% of females). About a tenth (11.1%) currently attended lower primary school. Current lower primary school attendance was more frequent among males (16.1%) compared to females (6.0%; Table 4.4.B).

Table 4.4.A Demographic characteristics of the pediatric population

Percent distribution of population aged 0-14 years by sex and selected demographic characteristics, SHIMS2 2016-2017

	Males		Females		Total	
Characteristic	Percent	Number	Percent	Number	Percent	Number
Age						
0-17 months	10.3	176	9.3	165	9.8	341
18-59 months	26.2	461	27.2	478	26.7	939
5-9 years	33.5	658	33.2	663	33.3	1,321
10-14 years	30.0	586	30.3	593	30.2	1,179
Residence						
Urban	18.1	259	18.3	259	18.2	518
Rural	81.9	1,622	81.7	1,640	81.8	3,262
Region						
Hhohho	27.4	532	27.5	534	27.5	1,066
Lubombo	22.2	438	20.4	407	21.3	845
Manzini	32.6	564	31.3	540	31.9	1,104
Shiselweni	17.8	347	20.8	418	19.3	765
Wealth quintile						
Lowest	25.5	506	27.0	548	26.2	1,054
Second	22.8	438	24.5	476	23.7	914
Middle	24.6	485	25.3	498	24.9	983
Fourth	14.6	248	11.1	185	12.9	433
Highest	12.5	203	12.0	191	12.3	394
Total 0-4	36.5	637	36.5	643	36.5	1,280
Total 0-14	100.0	1,881	100.0	1,899	100.0	3,780

The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

Table 4.4.B Demographic characteristics of the adolescent population

Percent distribution of the population aged 10-14 years, by sex and selected demographic characteristics, SHIMS2 2016-2017

	Males		Females		Total	
Characteristic	Percent	Number	Percent	Number	Percent	Number
Residence						
Urban	15.6	65	16.1	68	15.8	133
Rural	84.4	521	83.9	525	84.2	1,046
Region						
Hhohho	29.7	173	27.0	161	28.4	334
Lubombo	23.8	147	18.5	114	21.2	261
Manzini	30.7	166	31.9	174	31.3	340
Shiselweni	15.8	100	22.6	144	19.2	244
Education						
Currently in lower primary	16.1	94	(6.0)	35	11.1	129
Currently in higher primary	73.6	412	81.2	470	77.4	882
Currently in secondary	(9.2)	48	12.6	70	10.9	118
Not currently attending school	*	6	*	1	*	7
Total 10-14	100.0	586	100.0	593	100.0	1,179

Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.
Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed.
The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

5 HIV INCIDENCE

5.1 Key Findings

- Using the limiting antigen (LAg) avidity assay and viral load testing algorithm, annual HIV incidence among adults aged 15 years and older was 1.36% (1.02% males, 1.70% females). This corresponds to approximately 7,300 new cases of HIV infection annually among adults aged 15 years and older.
- Using an antiretroviral (ARV)-adjusted LAg avidity testing algorithm, annual HIV incidence among adults aged 15 years and older was 1.13% (0.85% males, 1.41% females). This corresponds to approximately 6,000 new cases of HIV infection annually among adults aged 15 years and older.
- Using an ARV-adjusted LAg avidity testing algorithm, annual HIV incidence among males was highest in those aged 25-34 years (1.50%) and among females was highest in those aged 35-49 years (2.09%).

5.2 Background

HIV incidence is the measure of new HIV infections in a population during a specified time period. It can provide important information on the status of the HIV epidemic and can be used for effective, targeted HIV prevention planning for groups that are most vulnerable to recent infection and for measuring the impact of HIV prevention programs. This chapter presents annual estimates of HIV incidence among adults (defined in this survey as those aged 15 years and older, unless otherwise noted) at the national level. Two sets of estimates are presented, each determined through a unique laboratory-based testing algorithm that distinguishes recent from long-term infections (Appendix B). SHIMS2 was not powered to estimate incidence at the regional level or across different sub-groups.

Incidence estimation was based on first identifying potential recent infections among all HIV-positive samples in the survey using the LAg avidity assay.[1,2] The first testing algorithm (i.e., HIV-1 LAg avidity plus VL) uses VL testing to exclude specimens with low VL and limit misclassification of persons as recent infections who are elite controllers or on effective ART. The second algorithm (i.e., HIV-1 LAg avidity plus VL and ARV detection) uses ARV detection to exclude specimens with high VL and limit misclassification of persons as recent infections who are on ART but have drug resistance or poor treatment adherence.

5.3 HIV Incidence Among Adults

HIV incidence estimates using LAg avidity and HIV viral load

Using the LAg avidity assay and VL testing algorithm, estimated incidence was 1.36% (95% CI: 0.92%-1.80%) among adults (1.02% among males and 1.70% among females). This corresponds to approximately 7,300 new cases of HIV infection annually among adults. Annual incidence peaked among males aged 25-34 years (1.50%), and females aged 35-49 years (2.40%). HIV incidence for adults aged 15-49 years was estimated at 1.48% (95% CI: 0.93%-2.03%; 0.99% in males, 1.99% in females). Estimates are not statistically significantly different; SHIMS2 was not designed to compare incidence estimates across demographic sub-groups (Table 5.3.A).

HIV incidence estimates using LAg avidity, HIV viral load, and ARV detection

Using the ARV-adjusted LAg avidity testing algorithm, estimated incidence was 1.13% (95% CI: 0.73%-1.53%) among adults (0.85% in males and 1.41% in females). This corresponds to approximately 6,000 new cases of HIV infection annually among adults. Annual incidence peaked among males aged 25-34 years (1.50%), and among females aged 35-49 years (2.09%). HIV incidence for adults aged 15-49 years was estimated at 1.28% (95% CI: 0.77%-1.79%; 0.85% among males and 1.73% among females). Estimates are not statistically significantly different; SHIMS2 was not designed to compare incidence estimates across demographic sub-groups (Table 5.3.B).

Table 5.3.A Annual HIV incidence using limiting antigen/viral load testing algorithm

Annual incidence of HIV among persons aged 15-49 and 15 years and older using the limiting antigen/viral load testing algorithm, by sex and age, SHIMS2 2016-2017

	Male		Female		Total	
Age	Percentage annual incidence[1]	95% CI[2]	Percentage annual incidence[1]	95% CI	Percentage annual incidence[1]	95% CI
15-24	0.79	(0.07, 1.50)	1.87	(0.76, 2.98)	1.31	(0.66, 1.96)
25-34	1.50	(0.00, 3.06)	1.84	(0.17, 3.48)	1.65	(0.49, 2.80)
35-49	0.68	(0.00, 1.85)	2.40	(0.45, 4.33)	1.65	(0.44, 2.85)
15-49	0.99	(0.32, 1.66)	1.99	(1.09, 2.88)	1.48	(0.93, 2.03)
15+	1.02	(0.47, 1.57)	1.70	(0.96, 2.44)	1.36	(0.92, 1.80)

[1] Relates to Global AIDS Monitoring indicator 3.1: HIV incidence

[2] CI (confidence interval) indicates the interval that is expected to include the true population parameter 95% of the time

Table 5.3.B Annual HIV incidence using limiting antigen/viral load/antiretroviral testing algorithm

Annual incidence of HIV among persons aged 15-49 and 15 years and older, by sex and age, using LAg/VL/ARV algorithm, SHIMS2 2016-2017

	Male		Female		Total	
Age	Percentage annual incidence[1]	95% CI[2]	Percentage annual incidence[1]	95% CI	Percentage annual incidence[2]	95% CI
15-24	0.52	(0.00, 1.14)	1.67	(0.62, 2.71)	1.07	(0.46, 1.69)
25-34	1.50	(0.00, 3.06)	1.54	(0.00, 3.09)	1.52	(0.39, 2.64)
35-49	0.68	(0.00, 1.85)	2.09	(0.23, 3.92)	1.47	(0.31, 2.63)
15-49	0.85	(0.21, 1.49)	1.73	(0.96, 2.50)	1.28	(0.77, 1.79)
15+	0.85	(0.34, 1.35)	1.41	(0.78, 2.04)	1.13	(0.73, 1.53)

[1] Relates to Global AIDS Monitoring indicator 3.1: HIV incidence

[2] CI: confidence interval indicates the interval that is expected to include the true population parameter 95% of the time

5.4 Gaps and Unmet Needs

- New HIV infections continue at high rates among males aged 25-34 years and females aged 35-49 years.
- Prevention interventions that target both gender groups could more effectively control the epidemic.
- Incidence estimates of geographic micro-epidemics and population sub-groups, such as among key populations, would be useful to more precisely target intervention efforts.

5.5 References

1. Duong YT, Qiu M, De AK, et al. Detection of recent HIV-1 infection using a new limiting-antigen avidity assay: potential for HIV-1 incidence estimates and avidity maturation studies. *PLoS One*. 2012;7(3):e33328. doi: 10.1371/journal.pone.0033328. Epub 2012 Mar 27.

2. Duong YT, Kassanjee R, Welte A, et al. Recalibration of the limiting antigen avidity EIA to determine mean duration of recent infection in divergent HIV-1 subtypes. *PLoS One.* 2015 Feb 24;10(2):e0114947. doi: 10.1371/journal.pone.0114947.

6 HIV PREVALENCE

6.1 Key Findings

- HIV prevalence in adults aged 15 years and older was 27.0% (20.4% males, 32.5% females). This corresponds to approximately 197,000 adults aged 15 years and older living with HIV.
- HIV prevalence peaked in males aged 45-49 years (48.8%) and in females aged 35-39 years (54.2%).
- More than half of females aged 30-44 years were living with HIV: ages 30-34 years (50.7%), ages 35-39 years (54.2%), and ages 40-44 years (51.9%).
- Three-quarters (74.6%) of widowed females aged 15-49 years were living with HIV.
- HIV prevalence was 10.9% among adults aged 65 years and older.

6.2 Background

This chapter presents representative estimates of prevalence of HIV infection among adults (defined in this survey as those aged 15 years and older, unless otherwise noted) at the national and regional levels by selected demographic and behavioral characteristics. It also presents HIV prevalence estimates among children (defined in this survey as those aged 0-14 years, unless otherwise noted) at the national level and estimates of the number of people living with HIV in Eswatini. HIV prevalence testing was conducted in each household using a serological rapid diagnostic testing algorithm based on Eswatini's national guidelines. Appendix A describes the sample design and Appendix C provides estimates of sampling errors. Appendix B describes the HIV testing methodology.

6.3 Adult HIV Prevalence by Select Demographic Characteristics

National HIV prevalence among adults was 27.0%. This corresponds to approximately 197,000 adults who are living with HIV. HIV prevalence was higher among females (32.5%) than males (20.4%). Nearly half (47.7%) of divorced/separated adults were living with HIV, compared with less than a fifth (18.4%) of those never married. About a third (34.1%) of adults in polygynous union were living with HIV. HIV prevalence among adults was higher among those with no education (31.6%) and those who completed only primary level education (32.5%), which was double the HIV prevalence among those with tertiary level education (16.0%; Table 6.3.A; Figure 6.3.A).

Among adults aged 15-49 years, HIV prevalence was 27.2% (18.9% in males and 34.3% in females). Almost three-quarters (74.6%) of widowed females aged 15-49 years were living with HIV. This group accounted for the majority of HIV prevalence among all widowed adults aged 15-49 years (73.1%). HIV prevalence was highest among those in polygynous union (43.7%). Over two-fifths (42.9%) of adults aged 15-49 years with no education were living with HIV. HIV prevalence was comparable between women aged 15-49 years who reported being currently pregnant (35.4%) versus those who reported not being currently pregnant (34.3%; Table 6.3.B).

Table 6.3.A HIV prevalence by demographic characteristics: Ages 15 years and older

Prevalence of HIV among persons aged 15 years and older, by sex and selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Male		Female		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
Residence						
Urban	23.5	970	34.9	1,295	29.8	2,265
Rural	19.3	3,536	31.6	5,133	26.0	8,669
Region						
Hhohho	19.7	1,402	31.0	1,882	25.7	3,284
Lubombo	23.5	971	34.9	1,282	29.4	2,253
Manzini	20.7	1,360	32.4	2,045	27.3	3,405
Shiselweni	17.1	773	32.8	1,219	25.9	1,992
Marital status						
Never married	10.6	2,550	26.6	2,758	18.4	5,308
Married	33.0	1,464	34.2	2,215	33.7	3,679
Living together	33.4	204	43.1	293	38.7	497
Divorced/separated	43.8	168	50.4	269	47.7	437
Widowed	37.5	94	40.0	860	39.7	954
Type of union						
In polygynous union	40.1	105	31.7	287	34.1	392
Not in polygynous union	32.8	1,524	35.7	2,064	34.3	3,588
Not currently in union	13.2	2,812	30.5	3,887	22.4	6,699
Don't know/missing	20.8	65	38.7	190	33.6	255
Education						
No education	28.6	257	33.6	531	31.6	788
Primary	25.9	1,436	38.6	1,947	32.5	3,383
Secondary	20.3	1,216	35.7	1,930	29.3	3,146
High school	16.9	1,223	27.5	1,493	22.3	2,716
Tertiary	11.4	367	20.0	513	16.0	880
Wealth quintile						
Lowest	21.8	1,039	34.7	1,563	28.9	2,602
Second	21.3	979	33.7	1,381	28.0	2,360
Middle	18.3	1,071	31.0	1,531	25.1	2,602
Fourth	22.5	716	36.8	996	30.3	1,712
Highest	18.5	700	26.3	955	22.7	1,655
Pregnancy status						
Currently pregnant	NA	NA	35.3	192	NA	NA
Not currently pregnant	NA	NA	32.4	6,169	NA	NA
Total 15+	20.4	4,506	32.5	6,428	27.0	10,934

The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

Figure 6.3.A HIV prevalence by marital status: Aged 15 years and older, SHIMS2 2016-2017

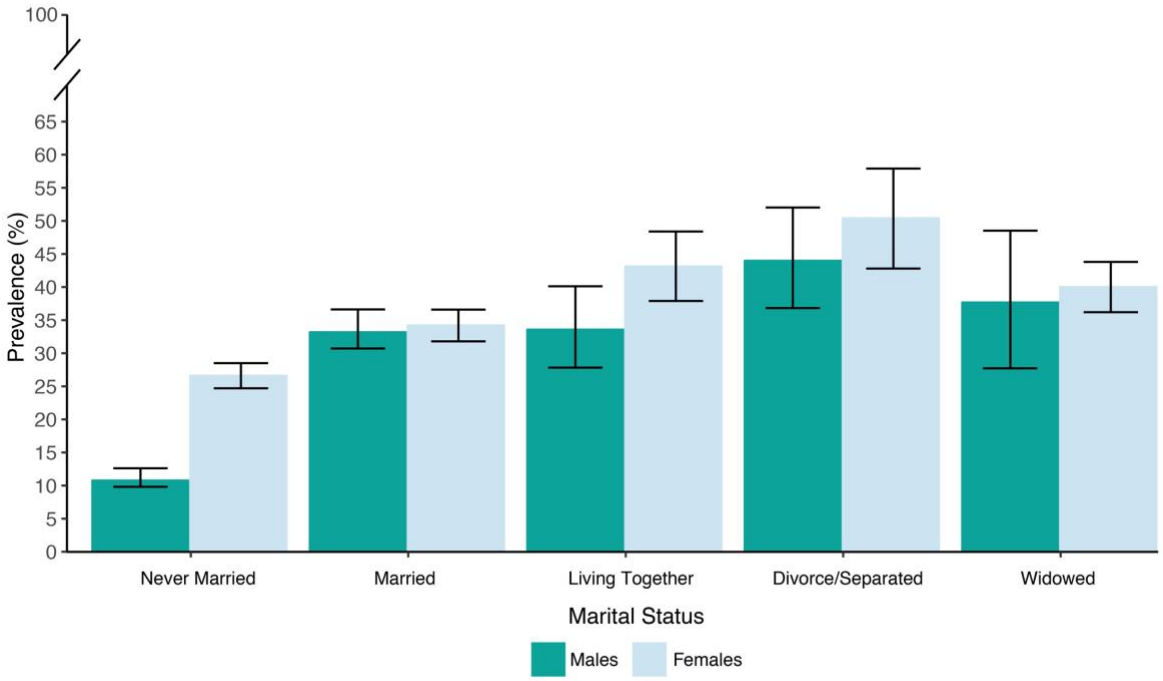


Table 6.3.B HIV prevalence by demographic characteristics: Ages 15-49 years

Prevalence of HIV among persons aged 15-49 years, by sex and selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Male		Female		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
Residence						
Urban	21.4	842	36.2	1,100	29.5	1,942
Rural	17.9	2,813	33.6	3,778	26.3	6,591
Region						
Hhohho	17.9	1,160	32.4	1,451	25.5	2,611
Lubombo	22.0	772	36.5	973	29.6	1,745
Manzini	19.5	1,117	34.1	1,592	27.7	2,709
Shiselweni	15.3	606	35.8	862	26.8	1,468
Marital status						
Never married	10.1	2,485	26.4	2,584	18.0	5,069
Married	37.0	840	37.7	1,654	37.4	2,494
Living together	33.6	159	44.1	255	39.6	414
Divorced/separated	42.3	128	57.2	181	51.0	309
Widowed	*	20	74.6	175	73.1	195
Type of union						
In polygynous union	(56.9)	39	40.1	155	43.7	194
Not in polygynous union	35.9	932	38.5	1,622	37.5	2,554
Not currently in union	12.0	2,633	31.4	2,940	21.7	5,573
Don't know/missing	17.4	51	40.5	161	34.2	212
Education						
No education	32.3	100	50.8	141	42.9	241
Primary	26.2	1,057	43.8	1,231	35.2	2,288
Secondary	18.5	1,054	37.0	1,667	29.4	2,721
High school	15.4	1,133	27.8	1,396	21.8	2,529
Tertiary	9.5	309	20.1	435	15.2	744
Wealth quintile						
Lowest	21.7	815	36.1	1,105	29.5	1,920
Second	19.1	775	36.4	1,035	28.4	1,810
Middle	16.6	863	33.1	1,131	25.3	1,994
Fourth	20.4	618	38.1	820	30.1	1,438
Highest	16.9	583	28.0	785	23.0	1,368
Pregnancy status						
Currently pregnant	NA	NA	35.4	191	NA	NA
Not currently pregnant	NA	NA	34.3	4,627	NA	NA
Total 15-49	18.9	3,655	34.3	4,878	27.2	8,533

The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.
Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.
Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed.

6.4 Adult HIV Prevalence by Age and Sex

HIV prevalence among adults aged 15-24 years was 9.1% and was over three times as prevalent in females (13.9%) than in males (4.1%). Over one in three (36.3%) adults aged 25 years and older was living with HIV. HIV prevalence among adults aged 25 years and older was 41.2% in females and 29.9% in males (Table 6.4.A).

Among adults, HIV prevalence peaked at 49.1% in those aged 35-39 years. HIV prevalence was highest in females aged 35-39 years (54.2%) and in males aged 45-49 years (48.8%). In fact, more than half of females aged 30-34 years (50.7%), 35-39 years (54.2%), and 40-44 years (51.9%) were living with HIV. HIV prevalence, when estimated across five-year age groups from ages 20-39 years, was significantly higher in females than in males (ages 20-24 years: 20.9% vs 4.2%; ages 25-29 years: 37.5% vs 13.3%; ages 30-34 years: 50.7% vs 28.1%; ages 35-39 years: 54.2% vs 41.9%; Figure 6.4.A).

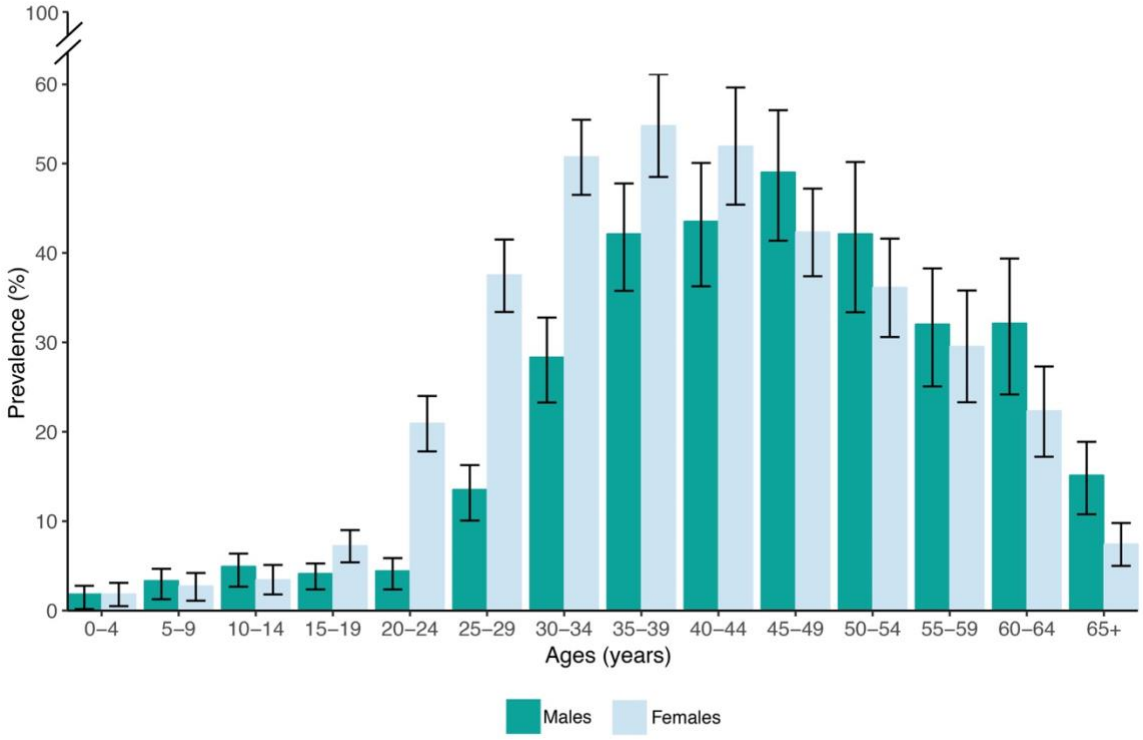
A tenth (10.9%) of adults aged 65 years and older were living with HIV. HIV prevalence was double the percentage in males (14.9%) than in females (7.4%) in this age bracket.

Table 6.4.A HIV prevalence by age and sex

Prevalence of HIV among persons in Eswatini, by sex and age, SHIMS2 2016-2017

	Male		Female		Total	
Age	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
0-17 months	4.3	142	4.0	124	4.2	266
18-59 months	0.5	377	1.0	388	0.8	765
5-9	3.1	587	2.7	600	2.9	1,187
10-14	4.7	576	3.4	578	4.1	1,154
Total 0-4	1.6	519	1.8	512	1.7	1,031
Total 0-14	3.0	1,682	2.6	1,690	2.8	3,372
15-19	3.9	1,028	7.2	1,031	5.6	2,059
20-24	4.2	647	20.9	895	12.8	1,542
25-29	13.3	572	37.5	811	26.1	1,383
30-34	28.1	474	50.7	744	40.8	1,218
35-39	41.9	410	54.2	568	49.1	978
40-44	43.3	292	51.9	430	48.4	722
45-49	48.8	232	42.3	399	44.9	631
50-54	41.9	192	36.1	360	38.5	552
55-59	31.8	176	29.5	298	30.5	474
60-64	31.9	163	22.3	294	26.8	457
65+	14.9	320	7.4	598	10.9	918
15-29	6.7	2,247	21.2	2,737	14.2	4,984
20-39	18.3	2,103	39.0	3,018	29.5	5,121
25+	29.9	2,831	41.2	4,502	36.3	7,333
Total 15-24	4.1	1,675	13.9	1,926	9.1	3,601
Total 15-49	18.9	3,655	34.3	4,878	27.2	8,533
Total 15+	20.4	4,506	32.5	6,428	27.0	10,934

Figure 6.4.A HIV prevalence by age and sex, SHIMS2 2016-2017



6.5 Adult HIV Prevalence by Region

In Eswatini, HIV prevalence among adults did not vary substantially across regions. HIV prevalence was 25.7% in Hhohho, 25.9% in Shiselweni, 27.3% in Manzini, and 29.4% in Lubombo (Figures 6.5.A and 6.5.B).

Figure 6.5.A HIV prevalence (map) among adults aged 15 years and older, by region, SHIMS2 2016-2017

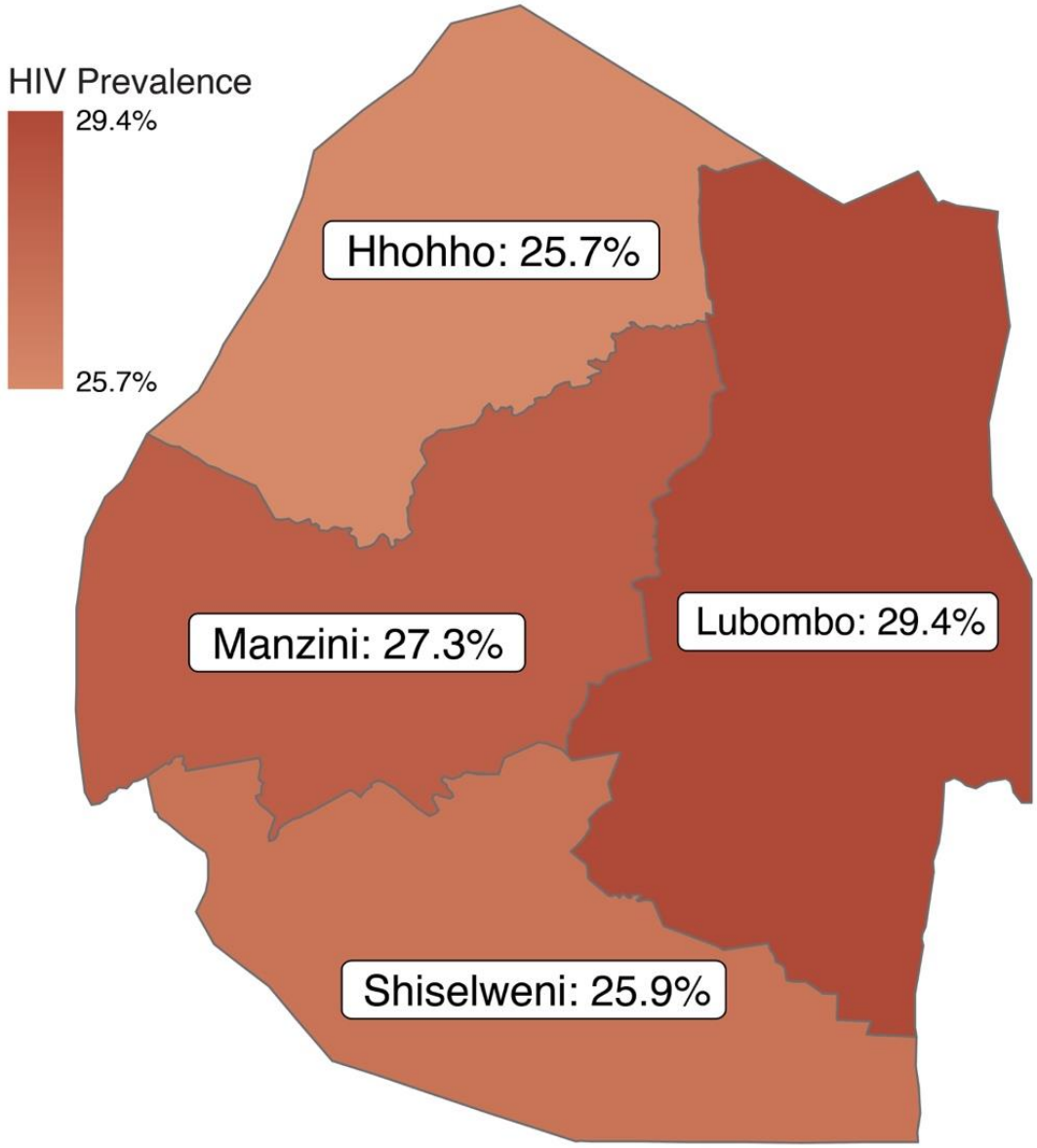
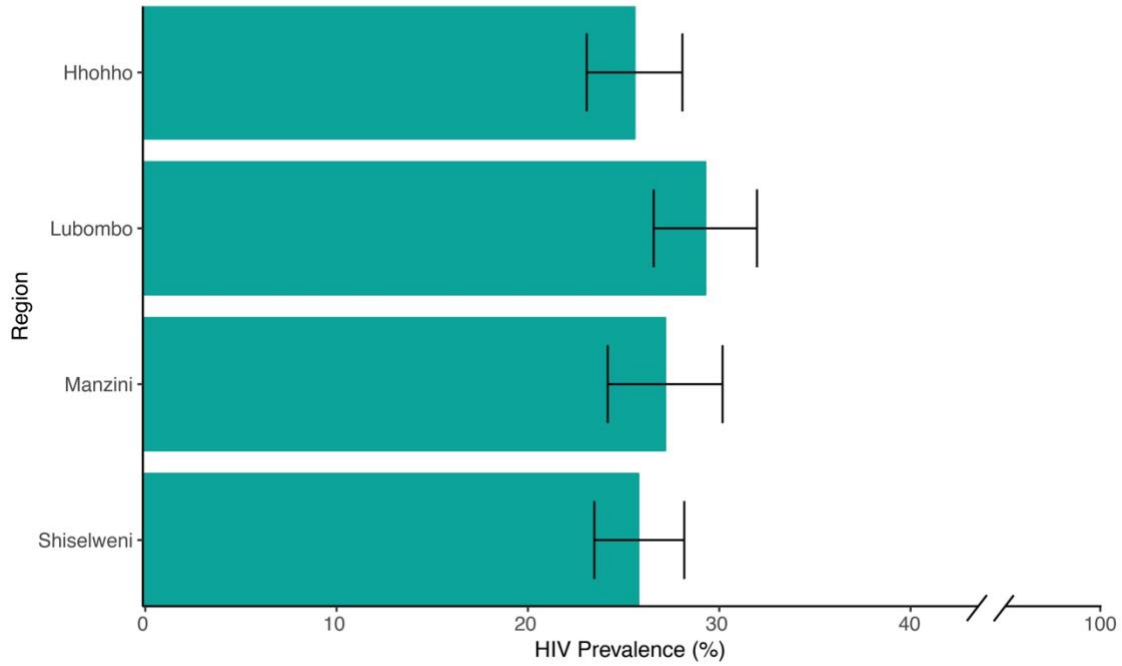


Figure 6.5.B HIV prevalence (bar graph) among adults aged 15 years and older, by region, SHIMS2 2016-2017



6.6. Gaps and Unmet Needs

- Targeting high prevalence populations for testing, treatment, and care will help the country reach the 90-90-90 goals.

7 HIV TESTING

7.1 Key Findings

- A large majority (87.1%) of adults aged 15 years and older had ever tested for HIV and received their test results (81.9% males, 91.4% females).
- Lifetime testing among males was lower in ages 15-19 years (61.9%) and ages 20-24 years (77.7%) and peaked in ages 45-49 years at 91.0%. Among females, lifetime testing was 90% or higher in ages 20-64 years and peaked at 99.4% in ages 30-34 years.
- One in two (51.6%) adults aged 15 years and older had tested for HIV and received their test result in the prior 12 months.
- Testing in the prior 12 months among adults aged 15 years and older was lowest in ages 15-19 years (40.6%), and highest in ages 20-24 years (63.1%) and 25-29 years (63.1%).

7.2 Background

HIV testing is necessary for awareness of HIV status and a critical component of HIV epidemic control targets. Awareness of HIV-positive status is the first step for engagement with HIV care and treatment services, accessing ART, prevention counseling for HIV-positive and HIV-negative individuals to reduce risk of HIV transmission or acquisition, and access to screening services for other co-morbidities.

Data presented in this section pertain to adults (defined in this survey as those aged 15 years and older, unless otherwise noted), who reported ever testing for HIV and receiving the test results. Results on HIV testing in the 12 months before the survey and receipt of the test results are also presented to understand frequent or recent testing.

7.3 Self-Reported HIV Testing Among Adults

Among adults, 87.1% had ever tested for HIV and received their test results (i.e., lifetime testing). Half (51.6%) had received HIV testing and their test results in the 12 months prior to the survey. Lifetime testing and testing in the prior 12 months were higher in those with tertiary education (91.0% and 56.8%, respectively) and lower in those not currently in a union (82.5% and 49.7%, respectively). HIV testing uptake was generally comparable across residence, region, and wealth quintile (Table 7.3.C).

Among adults aged 15-24 years, about three-quarters (75.4%) had ever tested for HIV and received their test results. Lifetime testing was lower in ages 15-19 years (65.2%) than in ages 20-24 years (86.1%). In contrast, the majority (93.2%) of those aged 25 years and older had ever tested for HIV. Among adults aged 15-24 years, about half (51.6%) had received HIV testing and their test results in the 12 months prior to the survey. Among adults, testing in the prior 12 months was lowest in ages 15-19 years (40.6%) and highest in ages 20-24 years (63.1%) and 25-29 years (63.1%; Table 7.3.C).

Lifetime testing and testing in the prior 12 months were higher among females (91.4% and 55.3%, respectively) than males (81.9% and 47.2%, respectively). Among females, lifetime testing was lower in ages 15-19 years (68.3%) and ages 65 years and older (81.9%). Lifetime testing was 90% or higher in ages

20-64 years and peaked at 99.4% in ages 30-34 years. Among males, lifetime testing was lower in ages 15-19 years (61.9%) and ages 20-24 years (77.7%) and peaked in ages 45-49 years at 91.0%. Testing in the prior 12 months was significantly higher in ages 15-19 years in females (47.9%) than males (33.0%) and significantly higher in ages 20-24 years in females (74.2%) than males (51.1%; Tables 7.3.A and 7.3.B, Figure 7.3.A).

Table 7.3.A Self-reported HIV testing: Males

Percentage of men, defined as the male population aged 15 years and older, who ever received HIV testing and received their test results, and percentage who received HIV testing and received their test results in the past 12 months, by result of PHIA survey HIV test and selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Percentage who ever received HIV testing and received results[1]	Percentage who received HIV testing in the past 12 months and received results[1]	Number
Result of PHIA survey HIV test			
HIV positive	92.6	32.5	966
HIV negative	79.9	51.0	3,494
Not tested	74.9	48.1	392
Residence			
Urban	82.9	48.9	1,085
Rural	81.6	46.6	3,767
Region			
Hhohho	80.5	45.0	1,522
Lubombo	84.6	49.3	1,009
Manzini	82.1	48.6	1,472
Shiselweni	81.1	45.6	849
Marital status			
Never married	76.1	46.7	2,741
Married	90.9	49.5	1,581
Living together	87.2	47.8	227
Divorced/separated	90.1	39.1	178
Widowed	84.5	37.6	98
Type of union			
In polygynous union	93.2	51.6	109
Not in polygynous union	90.2	48.5	1,659
Not currently in union	77.1	46.0	3,017
Don't know/missing	86.0	61.7	67
Education			
No education	85.5	46.1	274
Primary	81.6	44.9	1,479
Secondary	78.4	44.3	1,279
High school	82.7	49.0	1,359
Tertiary	87.2	56.0	454
Wealth quintile			
Lowest	80.8	47.1	1,085
Second	83.1	46.4	1,029
Middle	82.8	48.4	1,145
Fourth	79.5	46.9	789
Highest	83.0	46.8	803
Age			
15-19	61.9	33.0	1,059
20-24	77.7	51.1	698
25-29	88.1	60.9	635
30-34	90.8	53.7	539
35-39	89.3	47.4	451
40-44	90.6	44.9	321
45-49	91.0	43.5	245
50-54	87.0	38.9	213
55-59	88.3	40.9	184
60-64	89.1	43.5	174
65+	85.9	49.2	333
15-29	75.0	47.3	2,392
20-39	85.5	53.8	2,323
25+	89.1	50.3	3,095
Total 15-24	69.5	41.8	1,757
Total 15-49	80.9	47.8	3,948
Total 15+	81.9	47.2	4,852

[1]Relates to PEPFAR indicator DIAGNOSED_NAT.

The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

Table 7.3.B Self-reported HIV testing: Females

Percentage of women, defined as the female population aged 15 years and older, who ever received HIV testing and received their test results, and percentage who received HIV testing and received their test results in the past 12 months, by result of survey HIV test and selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Percentage who ever received HIV testing and received results[1]	Percentage who received HIV testing in the past 12 months and received results[1]	Number
Result of PHIA survey HIV test			
HIV positive	99.0	31.5	2,027
HIV negative	87.7	67.0	4,366
Not tested	90.8	56.1	325
Residence			
Urban	90.8	55.0	1,400
Rural	91.7	55.4	5,318
Region			
Hhohho	90.4	53.9	1,980
Lubombo	92.5	56.5	1,308
Manzini	91.8	55.4	2,147
Shiselweni	91.2	56.2	1,283
Marital status			
Never married	85.6	55.5	2,898
Married	97.9	58.8	2,322
Living together	99.3	61.4	301
Divorced/separated	95.7	52.5	289
Widowed	90.5	41.4	875
Type of union			
In polygynous union	97.3	61.0	291
Not in polygynous union	98.2	58.6	2,167
Not currently in union	87.2	53.0	4,062
Don't know/missing	96.4	58.8	198
Education			
No education	90.7	50.9	535
Primary	92.3	49.7	1,976
Secondary	90.1	55.2	1,990
High school	91.1	61.1	1,613
Tertiary	94.4	57.4	592
Wealth quintile			
Lowest	92.3	55.3	1,578
Second	93.0	57.9	1,428
Middle	91.6	57.8	1,585
Fourth	91.8	54.3	1,066
Highest	88.2	50.2	1,059
Age			
15-19	68.3	47.9	1,050
20-24	93.9	74.2	949
25-29	98.1	65.0	860
30-34	99.4	55.2	804
35-39	98.8	48.6	599
40-44	99.2	45.5	446
45-49	96.6	52.6	419
50-54	93.3	47.0	375
55-59	94.0	50.0	306
60-64	90.3	45.1	301
65+	81.9	42.2	609
15-29	86.3	62.2	2,859
20-39	97.3	62.2	3,212
25+	96.3	52.6	4,719
Total 15-24	81.0	61.0	1,999
Total 15-49	91.9	57.1	5,127
Total 15+	91.4	55.3	6,718

[1]Relates to PEPFAR indicator DIAGNOSED_NAT.

The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

Table 7.3.C Self-reported HIV testing: Total

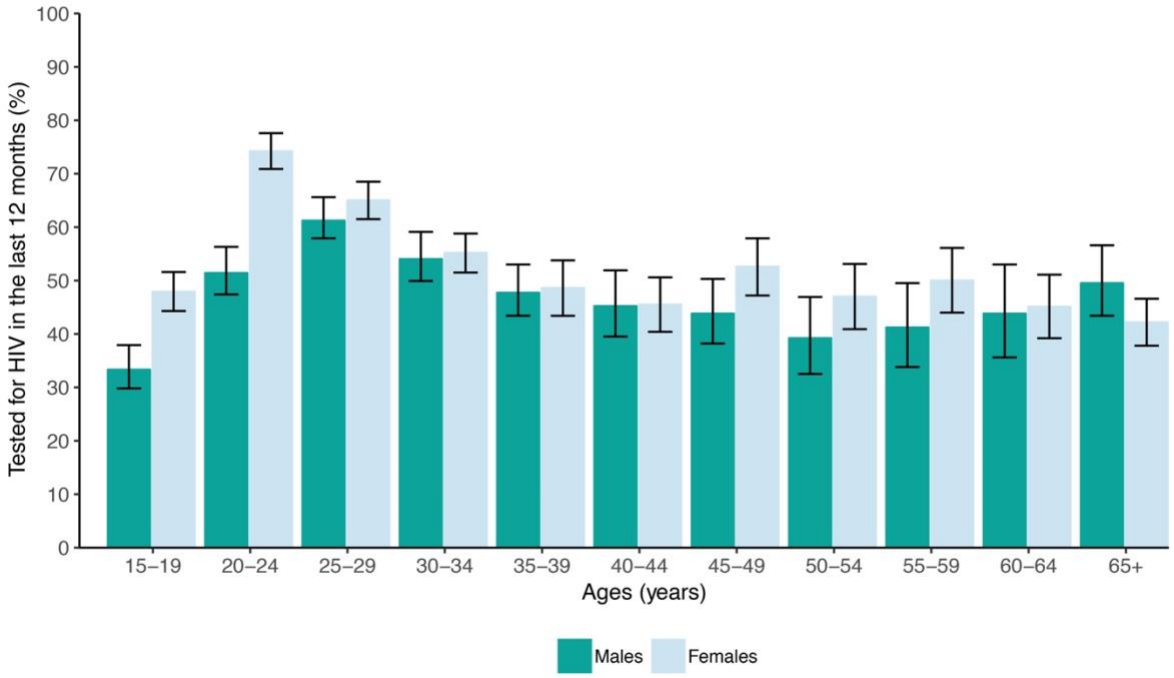
Percentage of adults, those aged 15 years and older, who ever received HIV testing and received their test results, and percentage who received HIV testing and received their test results in the past 12 months, by result of PHIA survey HIV test and selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Percentage who ever received HIV testing and received their results[1]	Percentage who received HIV testing in the past 12 months and received their results[1]	Number
Result of PHIA survey HIV test			
HIV positive	96.8	31.9	2,993
HIV negative	83.9	59.2	7,860
Not tested	81.6	51.5	717
Residence			
Urban	87.2	52.2	2,485
Rural	87.1	51.3	9,085
Region			
Hhohho	85.7	49.7	3,502
Lubombo	88.7	53.1	2,317
Manzini	87.5	52.4	3,619
Shiselweni	86.8	51.6	2,132
Marital status			
Never married	80.7	51.0	5,639
Married	94.9	54.7	3,903
Living together	93.7	55.1	528
Divorced/separated	93.5	47.1	467
Widowed	89.8	40.9	973
Type of union			
In polygynous union	96.1	58.2	400
Not in polygynous union	94.5	53.9	3,826
Not currently in union	82.5	49.7	7,079
Don't know/missing	93.5	59.6	265
Education			
No education	88.6	49.0	809
Primary	87.2	47.4	3,455
Secondary	85.3	50.7	3,269
High school	87.0	55.3	2,972
Tertiary	91.0	56.8	1,046
Wealth quintile			
Lowest	87.1	51.6	2,663
Second	88.5	52.6	2,457
Middle	87.5	53.5	2,730
Fourth	86.2	50.9	1,855
Highest	85.8	48.7	1,862
Age			
15-19	65.2	40.6	2,109
20-24	86.1	63.1	1,647
25-29	93.4	63.1	1,495
30-34	95.6	54.5	1,343
35-39	94.9	48.1	1,050
40-44	95.7	45.3	767
45-49	94.4	48.9	664
50-54	90.6	43.6	588
55-59	91.6	46.1	490
60-64	89.7	44.4	475
65+	83.7	45.5	942
15-29	80.8	55.0	5,251
20-39	91.9	58.4	5,535
25+	93.2	51.6	7,814
Total 15-24	75.4	51.6	3,756
Total 15-49	86.9	52.9	9,075
Total 15+	87.1	51.6	11,570

[1]Relates to PEPFAR indicator DIAGNOSED_NAT.

The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable

Figure 7.3.A Proportion of adults aged 15 years and older who reported having received an HIV test in the last 12 months, by age and sex, SHIMS2 2016-2017



7.4 Gaps and Unmet Needs

- Lifetime and testing in the prior 12 months were lower among men than women in ages 15 years and older. Continued efforts to increase HIV testing uptake among men is needed to remove this gender gap.
- HIV testing uptake was lower in ages 15-24 years compared to ages 25 years and older. Among adults, HIV testing uptake was lowest in male and female adults aged 15-19 years. Strategies to increase testing among young people, aged 15-24 years, is needed with specialized targeting of ages 15-19 years.
- Testing in the prior 12 months among ages 15-24 years was significantly higher among women than men. Greater focus toward HIV testing among men aged 15-24 years is warranted.

8 HIV Diagnosis and Treatment

8.1 Key Findings

- A majority (84.7%) of HIV-positive adults aged 15 years and older reported being aware of their HIV-positive status (77.5% males, 88.6% females).
- About three-quarters (74.1%) of adults living with HIV aged 15 years and older reported awareness of their HIV-positive status and currently being on antiretroviral therapy (ART) (68.7% males, 77.0% females).
- A large majority (95.9%) of HIV-positive adults aged 15 years and older who reported current ART use had detectable ARVs in their blood. Among those who reported as not previously diagnosed, 14.8% had detectable ARVs in their blood; 8.3% of adults who reported as previously diagnosed and not on ART had detectable ARVs in their blood.

8.2 Background

Recent studies have proven that treating people living with HIV at higher CD4 counts improves immune recovery; decreases the incidence of non-AIDS events, comorbidities, and mortality; and reduces sexual and vertical transmission. In 2016, after extensive review of evidence of both the clinical and population-level benefits of expanding ART, the WHO changed their recommendation to support a policy of "Treat All," regardless of CD4 count.[1,2] By November 2017, almost 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 October 2016.

8.3 Self-Reported Diagnosis and Treatment Status Among HIV-Positive Adults

Among HIV-positive adults (defined in this survey as those aged 15 years and older, unless otherwise noted), 15.3% reported they were unaware of their HIV-positive status. The percentage of HIV-positive males reported as unaware of their HIV-positive status was nearly double the percentage of HIV-positive females (22.5% in males versus 11.4% in females). Overall, unawareness of one's HIV-positive status was higher in urban areas (20.5%) than in rural areas (13.1%). Being unaware of one's HIV-positive status was highest in those never married (23.0%) and not currently in union (18.4%). Being unaware of one's HIV-positive status was lowest in Shiselweni region (8.7%), among those widowed (4.1%), and among those with no education (9.5%; Tables 8.3.A, 8.3.B, and 8.3.C).

Among adults living with HIV aged 15-24 years, 33.9% were unaware of their HIV-positive status. Across all adults, being unaware of one's HIV-positive status was highest in ages 15-19 years (35.6%) and next highest in ages 20-24 years (33.1%). About half (48.5%) of HIV-positive males aged 15-24 years were unaware of their HIV-positive status compared with less than one-third (29.8%) of HIV-positive females aged 15-24 years (Tables 8.3.A, 8.3.B, and 8.3.C).

Among adults living with HIV, nearly three-quarters (74.1%) reported awareness of their HIV-positive status and ART use: 68.7% in males and 77.0% in females. Overall, reported awareness of one's HIV-positive status and ART use was higher in rural areas (76.7%) than in urban areas (67.9%). Awareness of one's HIV-positive status and ART use was highest in Shiselweni region (82.7%), among those widowed

(86.7%), and among those with no education (85.9%). The percentage of HIV-positive adults reported on ART, generally decreased with the increase of education level and wealth quintile (Tables 8.3.A, 8.3.B, and 8.3.C).

Among people living with HIV aged 15-24 years, about half (54.1%) reported awareness of their HIV-positive status and ART use: 46.8% in males and 56.1% in females. Among all adults living with HIV, awareness of one's HIV-positive status and ART use was lowest in ages 20-24 years (53.6%) and in ages 15-19 years (55.0%). Reported awareness of HIV-positive status and ART use was 80% or greater in females aged 35 years and older and in males aged 50 years and older (Tables 8.3.A, 8.3.B, and 8.3.C, Figure 8.3.A).

Figure 8.3.A Proportion of HIV-positive adults aged 15 years and older, reporting awareness of HIV status and antiretroviral therapy (ART) status, by age and sex, SHIMS2 2016-2017

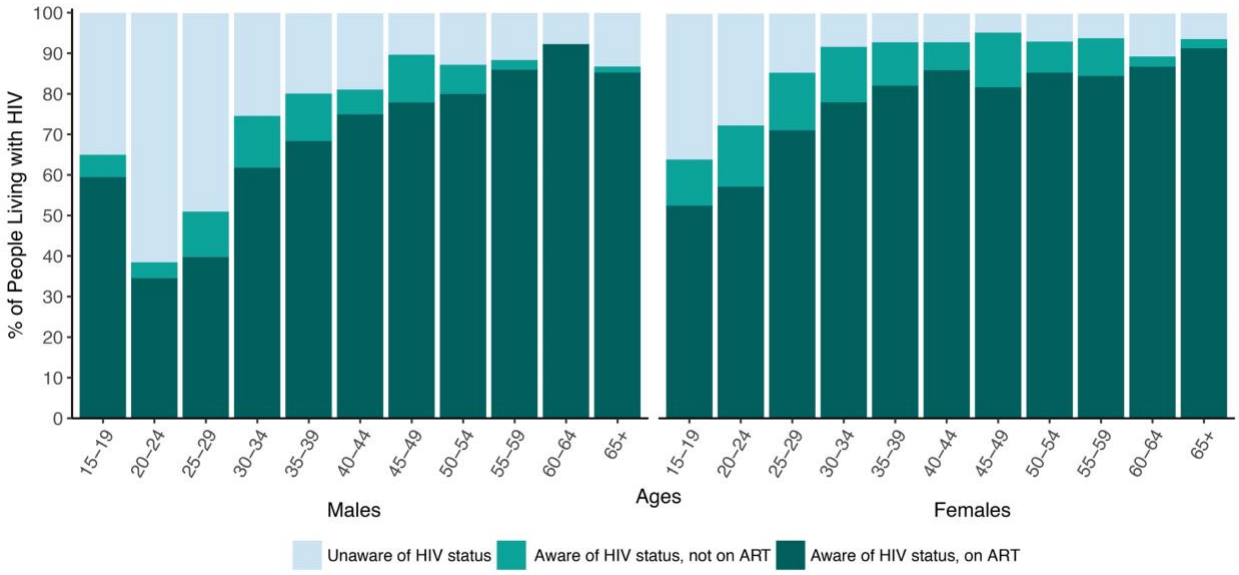


Table 8.3.A Self-reported HIV diagnosis and treatment status: Males

Percent distribution of HIV-positive men, those aged 15 years and older, by self-reported antiretroviral therapy (ART) status, by selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Unaware of HIV status	Aware of HIV status		Total	Number
		Not on ART	On ART[1]		
Residence					
Urban	29.8	10.1	60.1	100.0	256
Rural	19.4	8.2	72.4	100.0	712
Region					
Hhohho	24.3	6.8	68.9	100.0	294
Lubombo	17.4	15.1	67.5	100.0	239
Manzini	28.5	6.3	65.3	100.0	291
Shiselweni	12.1	8.8	79.1	100.0	144
Marital status					
Never married	36.4	9.0	54.6	100.0	281
Married	14.8	8.1	77.0	100.0	506
Living together	30.5	10.8	58.7	100.0	69
Divorced/separated	16.9	8.2	74.9	100.0	77
Widowed	(10.2)	(14.3)	(75.5)	100.0	33
Type of union					
In polygynous union	(16.9)	(14.0)	(69.1)	100.0	42
Not in polygynous union	16.5	8.1	75.4	100.0	520
Not currently in union	30.7	9.3	60.1	100.0	391
Don't know/missing	*	*	*	*	15
Education					
No education	16.2	3.5	80.2	100.0	73
Primary	20.3	6.7	73.0	100.0	377
Secondary	25.3	11.7	63.0	100.0	247
High school	27.3	9.4	63.4	100.0	220
Tertiary	(13.5)	(13.2)	(73.3)	100.0	46
Wealth quintile					
Lowest	18.9	5.5	75.6	100.0	235
Second	25.9	7.1	67.1	100.0	213
Middle	22.9	9.0	68.0	100.0	203
Fourth	23.9	9.7	66.4	100.0	169
Highest	21.2	14.1	64.6	100.0	147
Age					
15-19	(35.0)	(5.5)	(59.5)	100.0	39
20-24	(61.5)	(3.9)	(34.6)	100.0	29
25-29	48.9	11.2	39.8	100.0	81
30-34	25.4	12.8	61.8	100.0	139
35-39	19.8	11.7	68.4	100.0	183
40-44	18.8	6.1	75.0	100.0	133
45-49	10.2	11.8	77.9	100.0	122
50-54	12.8	7.2	80.0	100.0	84
55-59	11.6	2.4	86.0	100.0	57
60-64	7.7	0.0	92.3	100.0	53
65+	(13.2)	(1.5)	(85.3)	100.0	48
15-29	48.7	8.5	42.8	100.0	149
20-39	30.9	11.4	57.7	100.0	432
25+	20.5	9.1	70.4	100.0	900
Total 15-24	48.5	4.7	46.8	100.0	68
Total 15-49	25.6	10.3	64.1	100.0	726
Total 15+	22.5	8.8	68.7	100.0	968

[1]Relates to Global AIDS Monitoring indicator 1.2: People living with HIV on antiretroviral therapy and PEPFAR TX_CURR_NAT.

The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.

Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed.

Table 8.3.B Self-reported HIV diagnosis and treatment status: Females

Percent distribution of HIV-positive women, those aged 15 years and older, by self-reported antiretroviral therapy (ART) status, by selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Unaware of HIV status	Aware of HIV status		Total	Number
		Not on ART	On ART[1]		
Residence					
Urban	15.3	12.5	72.1	100.0	466
Rural	9.8	11.2	78.9	100.0	1,558
Region					
Hhohho	15.8	10.0	74.2	100.0	577
Lubombo	9.3	13.1	77.6	100.0	431
Manzini	11.2	13.5	75.3	100.0	636
Shiselweni	7.3	8.6	84.1	100.0	380
Marital status					
Never married	17.4	13.1	69.5	100.0	726
Married	7.7	11.4	81.0	100.0	748
Living together	13.9	8.2	77.9	100.0	124
Divorced/separated	11.6	13.5	74.9	100.0	124
Widowed	3.3	8.6	88.2	100.0	287
Type of union					
In polygynous union	12.4	8.9	78.7	100.0	82
Not in polygynous union	8.2	11.1	80.7	100.0	734
Not currently in union	13.6	12.1	74.2	100.0	1,137
Don't know/missing	8.4	11.5	80.1	100.0	71
Education					
No education	5.8	5.2	89.0	100.0	151
Primary	7.7	10.5	81.7	100.0	691
Secondary	11.4	12.1	76.5	100.0	657
High school	16.3	13.3	70.4	100.0	414
Tertiary	17.8	15.0	67.2	100.0	108
Wealth quintile					
Lowest	7.1	10.3	82.5	100.0	514
Second	9.4	10.1	80.5	100.0	437
Middle	12.6	13.2	74.1	100.0	453
Fourth	14.0	12.8	73.2	100.0	355
Highest	15.7	11.8	72.5	100.0	263
Age					
15-19	35.9	11.4	52.6	100.0	72
20-24	27.6	15.1	57.3	100.0	196
25-29	14.6	14.2	71.2	100.0	318
30-34	8.2	13.7	78.1	100.0	390
35-39	7.2	10.7	82.2	100.0	318
40-44	7.1	6.9	86.0	100.0	224
45-49	4.7	13.5	81.8	100.0	169
50-54	6.8	7.7	85.4	100.0	135
55-59	6.1	9.3	84.6	100.0	91
60-64	10.6	2.5	86.9	100.0	67
65+	(6.4)	(2.3)	(91.4)	100.0	44
15-29	21.5	14.2	64.3	100.0	586
20-39	12.6	13.2	74.1	100.0	1,222
25+	8.5	11.2	80.3	100.0	1,756
Total 15-24	29.8	14.2	56.1	100.0	268
Total 15-49	12.0	12.2	75.7	100.0	1,687
Total 15+	11.4	11.6	77.0	100.0	2,024

[1]Relates to Global AIDS Monitoring indicator 1.2: People living with HIV on antiretroviral therapy and PEPFAR TX_CURR_NAT.

The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.

Table 8.3.C Self-reported HIV diagnosis and treatment status: Total

Percent distribution of HIV-positive adults, those aged 15 years and older by self-reported HIV diagnosis and antiretroviral therapy (ART) status, by selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Unaware of HIV status	Aware of HIV status		Total	Number
		Not on ART	On ART[1]		
Residence					
Urban	20.5	11.7	67.9	100.0	722
Rural	13.1	10.2	76.7	100.0	2,270
Region					
Hhohho	18.8	8.9	72.3	100.0	871
Lubombo	12.4	13.8	73.8	100.0	670
Manzini	17.0	11.0	71.9	100.0	927
Shiselweni	8.7	8.7	82.7	100.0	524
Marital status					
Never married	23.0	11.9	65.1	100.0	1,007
Married	10.7	10.0	79.3	100.0	1,254
Living together	20.4	9.2	70.4	100.0	193
Divorced/separated	13.6	11.5	74.9	100.0	201
Widowed	4.1	9.2	86.7	100.0	320
Type of union					
In polygynous union	13.9	10.7	75.4	100.0	124
Not in polygynous union	11.8	9.8	78.4	100.0	1,254
Not currently in union	18.4	11.4	70.3	100.0	1,528
Don't know/missing	12.5	10.6	76.9	100.0	86
Education					
No education	9.5	4.6	85.9	100.0	224
Primary	12.5	9.1	78.4	100.0	1,068
Secondary	15.4	12.0	72.6	100.0	904
High school	20.3	11.9	67.8	100.0	634
Tertiary	16.3	14.4	69.3	100.0	154
Wealth quintile					
Lowest	11.1	8.7	80.2	100.0	749
Second	15.2	9.0	75.8	100.0	650
Middle	16.1	11.8	72.1	100.0	656
Fourth	17.3	11.8	70.9	100.0	524
Highest	17.8	12.7	69.6	100.0	410
Age					
15-19	35.6	9.4	55.0	100.0	111
20-24	33.1	13.3	53.6	100.0	225
25-29	22.9	13.5	63.7	100.0	399
30-34	13.4	13.5	73.1	100.0	529
35-39	11.6	11.0	77.3	100.0	501
40-44	11.3	6.6	82.1	100.0	357
45-49	7.1	12.7	80.1	100.0	291
50-54	9.5	7.5	83.0	100.0	219
55-59	8.5	6.3	85.2	100.0	148
60-64	9.0	1.1	89.9	100.0	120
65+	10.7	1.8	87.5	100.0	92
15-29	27.8	12.8	59.4	100.0	735
20-39	17.9	12.7	69.4	100.0	1,654
25+	12.9	10.5	76.7	100.0	2,656
Total 15-24	33.9	12.1	54.1	100.0	336
Total 15-49	16.3	11.6	72.1	100.0	2,413
Total 15+	15.3	10.6	74.1	100.0	2,992

[1]Relates to Global AIDS Monitoring indicator 1.2: People living with HIV on antiretroviral therapy and PEPFAR TX_CURR_NAT/SUBNAT.
The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

8.4 Concordance of Self-Reported Treatment Status Versus Laboratory ARV Data

ARVs (i.e., efavirenz, lopinavir and nevirapine) were detected in the blood of almost three-quarters (74.3%) of HIV-positive adults (69.6% in males and 76.7% in females). Among adults living with HIV reporting a prior HIV diagnosis and current ART use, 95.9% had detectable ARVs in their blood (96.1% in males and 95.8% in females; Tables 8.4.A, 8.4.B, and 8.4.C).

ARVs were detected in 14.8% of HIV-positive adults reporting no prior diagnosis. Among adults living with HIV reporting no prior diagnosis, the percentage with detectable ARVs was higher in females (18.3%) than in males (11.5%; Tables 8.4.A, 8.4.B, and 8.4.C).

Among HIV-positive adults reporting a prior diagnosis and no ART use, 8.3% had detectable ARVs in their blood. The percentage with detectable ARVs among adults living with HIV reporting a prior diagnosis and no ART use was lower in females (7.2%) than in males (11.0%; Tables 8.4.A, 8.4.B, and 8.4.C).

Table 8.4.A Concordance of self-reported treatment status versus presence of antiretrovirals (ARVs): Males

Percent distribution of HIV-positive males aged 15 years and older by presence of detectable ARVs versus self-reported HIV treatment status, SHIMS2 2016-2017

	ARV status[1]			
Characteristic	Not detectable	Detectable	Total	Number
Self-reported treatment status				
Not previously diagnosed	88.5	11.5	100.0	192
Previously diagnosed, not on ART[2]	89.0	11.0	100.0	82
Previously diagnosed, on ART	3.9	96.1	100.0	694
Total 15-24	54.2	45.8	100.0	68
Total 15-49	34.9	65.1	100.0	727
Total 15+	30.4	69.6	100.0	970

[1]Antiretroviral detection assay included only efavirenz, lopinavir, and nevirapine; [2] ART: Antiretroviral therapy.
The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

Table 8.4.B Concordance of self-reported treatment status versus presence of antiretrovirals (ARVs): Females

Percent distribution of HIV-positive females aged 15 years and older, by presence of detectable ARVs versus self-reported HIV treatment status, SHIMS2 2016-2017

	ARV status[1]			
Characteristic	Not detectable	Detectable	Total	Number
Self-reported treatment status				
Not previously diagnosed	81.7	18.3	100.0	212
Previously diagnosed, not on ART[2]	92.8	7.2	100.0	224
Previously diagnosed, on ART	4.2	95.8	100.0	1,584
Total 15-24	43.0	57.0	100.0	268
Total 15-49	24.5	75.5	100.0	1,686
Total 15+	23.3	76.7	100.0	2,023

[1]Antiretroviral detection assay included only efavirenz, lopinavir, and nevirapine; [2] ART: Antiretroviral therapy.
The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

Table 8.4.C Concordance of self-reported treatment status versus presence of antiretrovirals (ARVs): Total

Percent distribution of HIV-positive adults aged 15 years and older by presence of detectable ARVs versus self-reported HIV treatment status, SHIMS2 2016-2017

	ARV status[1]			
Characteristic	Not detectable	Detectable	Total	Number
Self-reported treatment status				
Not previously diagnosed	85.2	14.8	100.0	404
Previously diagnosed, not on ART[2]	91.7	8.3	100.0	306
Previously diagnosed, on ART	4.1	95.9	100.0	2,278
Total 15-24	45.5	54.5	100.0	336
Total 15-49	27.8	72.2	100.0	2,413
Total 15+	25.7	74.3	100.0	2,993

[1] Antiretroviral detection assay included only efavirenz, lopinavir, and nevirapine; [2] ART: Antiretroviral therapy.
The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

8.5 Gaps and Unmet Needs

- Awareness of HIV-positive status and current ART use among HIV-positive adults was lower in urban areas than in rural areas. Identifying undiagnosed HIV-positive adults and linkage to ART services may require tailored strategies unique to urban areas.
- Awareness of HIV-positive status and current ART use was lower among young people aged 15-24 years and among males. The needs of young males, in particular, are addressed less successfully. Specified program strategies are needed to address the distinctive needs of young men.
- Discordance between self-reported ART status and presence of detectable ARVs could be due to stigma. Programs may benefit from additional focus on stigma-reduction interventions.

8.6 References

1. World Health Organization. *Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection.* Geneva: World Health Organization; 2016. https://www.who.int/hiv/pub/arv/arv-2016/en/. Accessed December 17, 2018.

2. World Health Organization. *Treat all: Policy adoption and implementation status in countries*. Geneva: World Health Organization; 2017. http://apps.who.int/iris/bitstream/handle/10665/259532/WHO-HIV-2017.58-eng.pdf;jsessionid=B3857967C208CC9E4093EEA9CEDC3A0C?sequence=1. Accessed December 20, 2018.

9 VIRAL LOAD SUPPRESSION

9.1 Key Findings

- Prevalence of viral load suppression (VLS) among all HIV-positive adults aged 15 years and older was 73.1% (67.6% males, 76.0% females).
- Prevalence of VLS among HIV-positive adults aged 15 years and older who report being on ART was 91.9% (91.3% males, 92.2% females).
- VLS prevalence among all HIV-positive adults aged 15 years and older was lowest (50.6%) among those aged 15-24 years (32.9% males, 55.5% females).

9.2 Background

VLS is a key indicator of treatment success in HIV-positive individuals. For the purposes of SHIMS2, VLS is defined as VL less than 1,000 HIV RNA copies/mL of plasma. This chapter describes VLS among the population of HIV-positive adults (defined in this survey as those aged 15 years and older, unless otherwise noted) by age, sex, region, and other demographic characteristics.

9.3 Adult Viral Load Suppression by Demographic Characteristics

VLS prevalence among HIV-positive adults was 73.1%: 67.6% in males and 76.0% in females. The majority (91.9%) who reported as previously diagnosed and on ART had suppressed viral loads (91.3% in males and 92.2% in females), compared with less than a fifth (17.5%) of whom reported as previously diagnosed and not on ART. About a fifth (21.2%) of those reported as not previously diagnosed had suppressed viral loads. VLS prevalence was highest among widowed adults living with HIV (85.9%) and lowest among those never married (64.1%). VLS prevalence was also highest among HIV-positive adults with no education (86.1%; Table 9.3.A).

Table 9.3.A Viral load suppression by demographic characteristics

Among HIV-positive adults aged 15 years and older, percentage with viral load suppression (< 1,000 copies/mL)[1], by sex, self-reported HIV diagnosis and antiretroviral therapy (ART) status, and selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Males		Females		Total	
	Percentage VLS[2,3]	Number	Percentage VLS[2,3]	Number	Percentage VLS[2,3]	Number
Self-reported diagnosis and treatment status						
Not previously diagnosed	15.8	192	26.9	213	21.2	405
Previously diagnosed, not on ART	15.7	82	18.2	224	17.5	306
Previously diagnosed, on ART	91.3	694	92.2	1,587	91.9	2,281
Missing	*	4	*	7	*	11
Residence						
Urban	62.1	257	75.0	468	70.4	725
Rural	70.0	715	76.5	1,563	74.3	2,278
Region						
Hhohho	65.6	295	75.8	579	72.1	874
Lubombo	68.2	240	75.4	432	72.6	672
Manzini	65.7	292	74.4	639	71.5	931
Shiselweni	75.9	145	80.4	381	79.1	526
Marital status						
Never married	51.1	282	69.5	731	64.1	1,013
Married	77.9	508	79.2	748	78.6	1,256
Living together	58.9	69	75.9	125	69.3	194
Divorced/separated	71.0	77	75.4	124	73.8	201
Widowed	(73.8)	34	87.5	287	85.9	321
Type of union						
In polygynous union	(71.7)	42	80.1	82	77.2	124
Not in polygynous union	76.0	522	78.6	735	77.5	1,257
Not currently in union	56.6	393	74.1	1,142	69.3	1,535
Don't know/missing	*	15	75.5	72	72.1	87
Education						
No education	79.5	74	89.8	151	86.1	225
Primary	71.0	379	77.1	693	74.8	1,072
Secondary	61.6	247	74.9	659	71.0	906
High school	64.5	221	72.6	414	69.7	635
Tertiary	(70.1)	46	75.6	110	73.8	156
Wealth quintile						
Lowest	71.1	235	77.1	516	75.0	751
Second	68.2	214	80.3	437	76.1	651
Middle	69.5	205	72.1	456	71.2	661
Fourth	64.1	169	73.6	356	70.4	525
Highest	63.7	148	77.3	264	72.2	412
Total 15-24	32.9	69	55.5	269	50.6	338
Total 15-49	62.3	729	74.8	1,694	70.8	2,423
Total 15+	67.6	972	76.0	2,031	73.1	3,003

[1] mL: milliliter; [2] VLS: viral load suppression; [3] Relates to Global AIDS Monitoring indicator 1.4: People living with HIV who have suppressed viral loads and PEPFAR indicator VL_SUPPRESSION_NAT.

The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.

Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed.

9.4 Adult Viral Load Suppression by Age and Sex

Among HIV-positive adults aged 15-24 years, about half (50.6%) had a suppressed viral load: 32.9% in males and 55.5% in females. About three-quarters (76.1%) of people living with HIV aged 25 years and older had suppressed viral loads (70.3% in males and 79.3% in females). Among HIV-positive individuals aged 15 years and older, VLS prevalence was lowest in ages 15-19 years (49.8%) and highest in ages 60-64 years (89.8%; Table 9.4.A).

VLS prevalence was 80% or higher in females aged 35 years and older and in males aged 45 years and older. Most (85.5%) adults aged 65 years and older had a suppressed viral load with minimal difference between males (84.9%) and females (86.6%; Table 9.4.B; Figure 9.4.A).

Table 9.4.A Viral load suppression, by age and sex (5-year age groups)

Prevalence of viral load suppression (< 1,000 copies/mL)[1] among the HIV-positive population in Eswatini, by sex and age, SHIMS2 2016-2017

Age	Males		Females		Total	
	Percentage VLS[2,3]	Number	Percentage VLS[2,3]	Number	Percentage VLS[2,3]	Number
0-4	*	8	*	8	*	16
5-9	*	19	*	16	(64.4)	35
10-14	(57.1)	25	*	20	(60.5)	45
15-19	(40.2)	40	55.0	72	49.8	112
20-24	(25.8)	29	55.7	197	50.9	226
25-29	48.2	81	71.5	319	65.9	400
30-34	58.9	139	75.3	394	70.3	533
35-39	65.3	184	80.7	319	75.2	503
40-44	74.3	133	87.0	224	82.5	357
45-49	77.4	123	80.4	169	79.1	292
50-54	83.7	84	83.2	135	83.4	219
55-59	86.8	58	87.7	91	87.3	149
60-64	92.3	53	86.5	67	89.8	120
65+	(84.9)	48	(86.6)	44	85.5	92
15-29	41.7	150	64.2	588	59.0	738
20-39	56.6	433	72.7	1,229	68.1	1,662
25+	70.3	903	79.3	1,762	76.1	2,665
Total 15-24	32.9	69	55.5	269	50.6	338
Total 15-49	62.3	729	74.8	1,694	70.8	2,423
Total 15+	67.6	972	76.0	2,031	73.1	3,003

[1] mL: milliliter; [2] VLS: viral load suppression; [3] Relates to Global AIDS Monitoring indicator 1.4: People living with HIV who have suppressed viral loads and PEPFAR indicator VL_SUPPRESSION_NAT .

Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.

Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed.

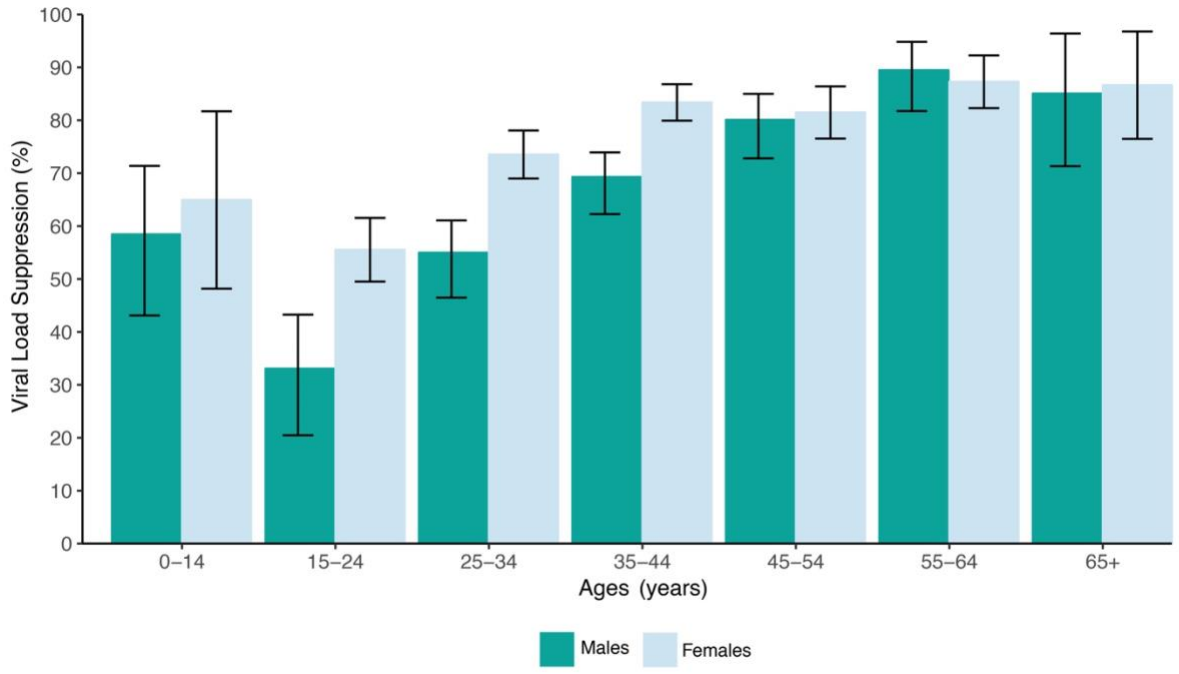
Table 9.4.B Viral load suppression, by age and sex (10-15-year age groups)

Percentage with viral load suppression (< 1,000 copies/mL)[1] among the HIV-positive population in Eswatini, by sex and age, SHIMS2 2016-2017

Age	Males		Females		Total	
	Percentage VLS[2,3]	Number	Percentage VLS[2,3]	Number	Percentage VLS[2,3]	Number
0–14	58.3	52	(64.9)	44	61.3	96
15–24	32.9	69	55.5	269	50.6	338
25–34	54.8	220	73.5	713	68.4	933
35–44	69.2	317	83.4	543	78.3	860
45–54	80.0	207	81.5	304	80.8	511
55-64	89.3	111	87.3	158	88.3	269
65+	(84.9)	48	(86.6)	44	85.5	92

[1] mL: milliliter; [2]VLS: viral load suppression; [3]Relates to Global AIDS Monitoring indicator 1.4: People living with HIV who have suppressed viral loads and PEPFAR indicator VL_SUPPRESSION_NAT.
Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.

Figure 9.4.A Proportion of viral load suppression (<1000 copies/mL) among people living with HIV, by age and sex, SHIMS2 2016-2017



9.5 Adult Viral Load Suppression by Region

In Eswatini, VLS prevalence among adults living with HIV was comparable across Manzini (71.5%), Hhohho (72.1%), and Lubombo (72.6%) regions. Prevalence of VLS was highest in Shiselweni (79.1%), compared with other regions (Figures 9.5.A and 9.5.B).

Figure 9.5.A Viral load (<1000 copies/mL) among HIV-positive adults aged 15 years and older, by region, SHIMS2 2016-2017

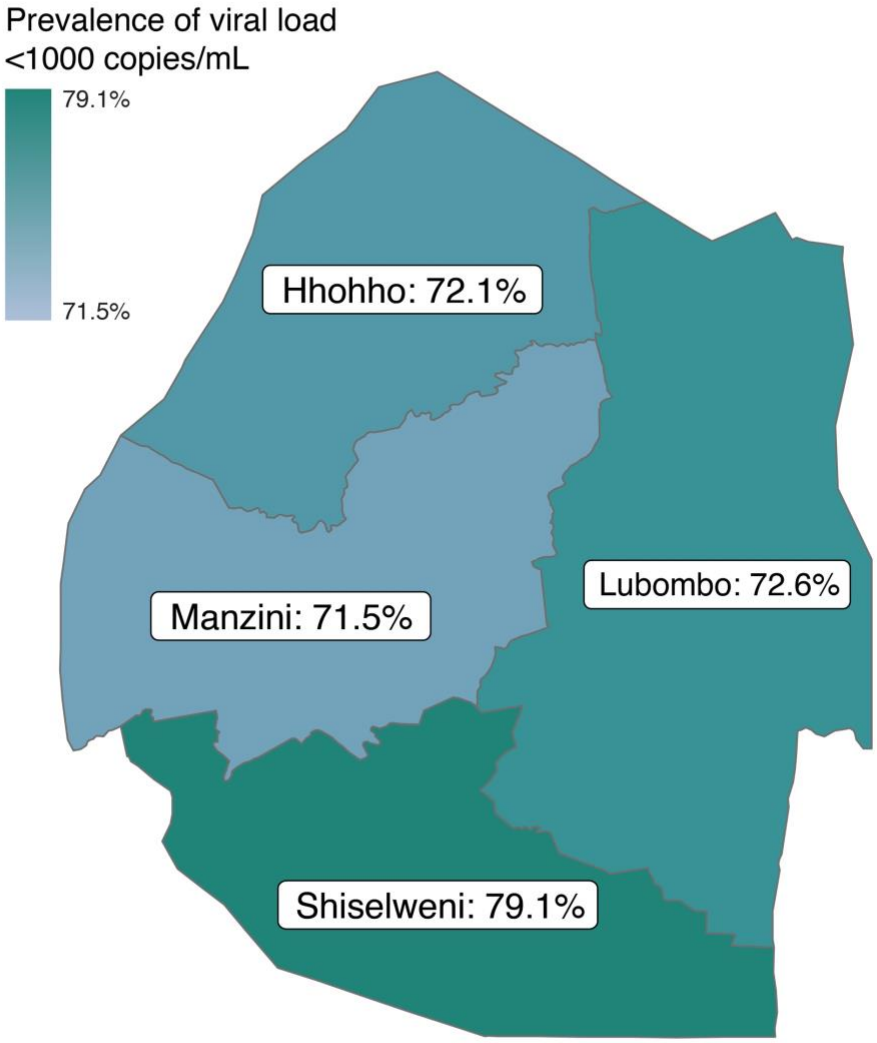
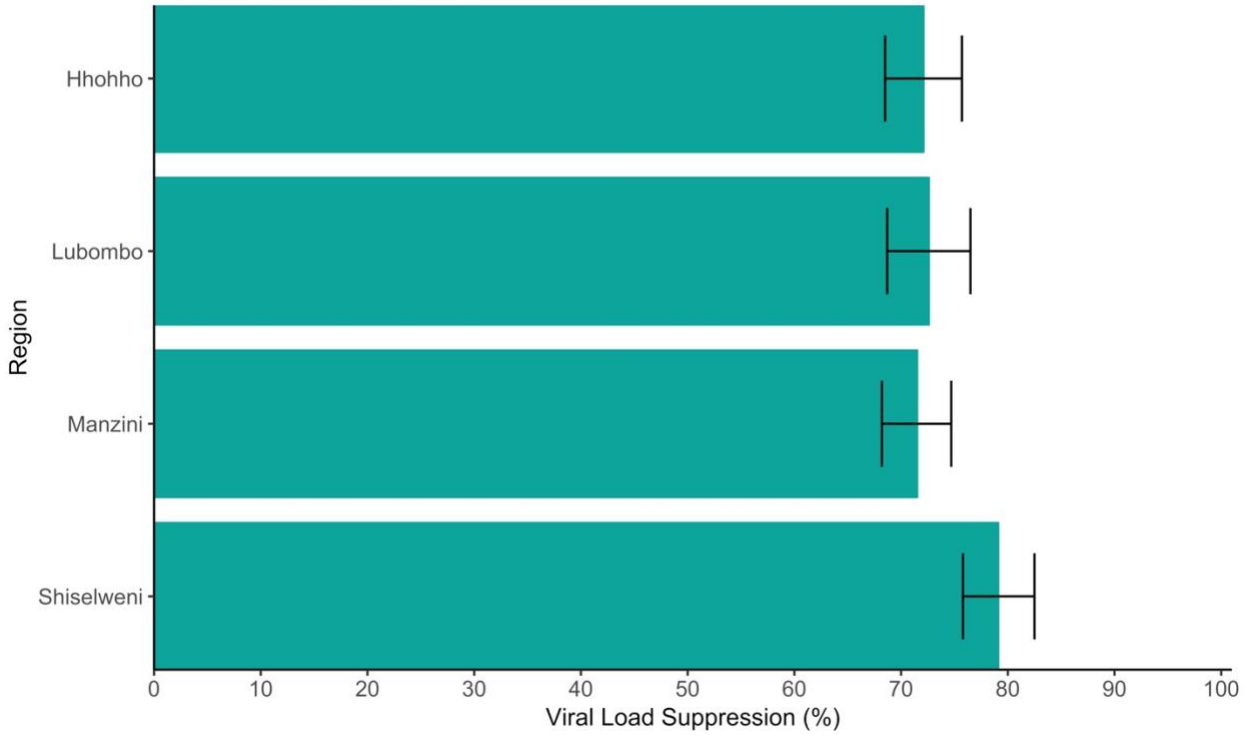


Figure 9.5.B Viral load (<1000 copies/mL) among HIV-positive adults aged 15 years and older, by region, SHIMS2 2016-2017



9.6 Gaps and Unmet Needs

- Although no gender disparity is present among HIV-positive adults with a prior HIV diagnosis and on ART, VLS among all adults living with HIV was higher among females than males. The gender gap in VLS among all HIV-positive adults may result from gender-based barriers to diagnosis and linkage to ART services. Concerted efforts to strengthen linkage to ART services, especially among adult males, may balance VLS between males and females.
- Young people living with HIV aged 15-24 years are lagging in HIV VLS. Differentiated services to better address the needs of young people need further consideration.

10 90-90-90 TARGETS

10.1 Key Findings

- Based on self-report and presence of detectable ARVs, 87.0% of adults living with HIV aged 15 years and older knew their HIV status (80.1% males, 90.7% females).
- Based on self-report and presence of detectable ARVs, 88.8% of HIV-positive adults aged 15 years and older were on ART (90.2% males, 88.1% females).
- Based on self-report and presence of detectable ARVs, 91.4% of adults living with HIV aged 15 years and older had suppressed viral loads (90.5% males, 91.8% females).

10.2 Background

To achieve HIV epidemic control, Eswatini adopted the UNAIDS 90-90-90 targets: By 2020, 90% of all people living with HIV will know their HIV status; 90% of all persons with diagnosed HIV infection will receive sustained ART; and 90% of all people receiving ART will have VLS.[1] The 90% target on diagnosis of HIV-positive persons measures accessibility and targeted uptake of national HIV testing services. The 90% target on sustained ART among those diagnosed measures accessibility of national treatment services and effectiveness of linkages from HIV testing to treatment. Lastly, the 90% target on VLS among those diagnosed and on ART measures treatment retention and adherence. The cumulative achievement of 90-90-90 targets results in VLS in at least 73% of all HIV-positive persons.

Previous chapters described the reach of national HIV testing services regardless of HIV status, the coverage of HIV treatment among the HIV-positive population nationwide, and the impact of testing and treatment services on VLS among people living with HIV in the country. This chapter presents the 90-90-90 indicators in two ways. First, Table 10.3.A uses self-reported diagnosis and self-reported ART use. Adults (defined in this survey as those aged 15 years and older, unless otherwise noted) are classified as diagnosed (i.e., knowledge or awareness of HIV-positive status) by a self-reported HIV-positive status before receipt of HIV rapid testing in SHIMS2. Adults are classified as on treatment (i.e., on ART) by a self-report of current ART use. Second, Table 10.3.B uses self-reported diagnosis, self-reported ART use, and ARV biomarker data. Diagnosed and on treatment measures in Table 10.3.A are adjusted to include persons with detectable ARVs in their blood, regardless of their self-reported diagnosis or self-reported ART use. Adults are classified as ARV-adjusted diagnosed by self-reported HIV-positive status before receipt of HIV rapid testing in SHIMS2 or by detectable ARVs in their blood. Adults are classified as ARV-adjusted on treatment by self-reported current use of ART or by detectable ARVs in their blood. In Tables 10.3.A and 10.3.B, adults with VLS who reported being unaware of their HIV-positive status or as not currently on treatment are excluded from the numerator of the 90% target on VLS.

10.3 Status of the 90-90-90 Targets

90-90-90 targets per self-reported HIV diagnosis and self-reported ART use

Among HIV-positive adults, 84.7% reported as diagnosed. Self-reported prior HIV diagnosis in adults was higher in females (88.6%) than in males (77.5%). Among self-reported diagnosed HIV-positive adults,

87.4% reported current treatment (88.6% in males and 86.9% in females). In adults reporting current treatment, 91.9% had suppressed viral loads: 91.3% in males and 92.2% in females (Table 10.3.A).

Among HIV-positive young people, 66.1% reported as diagnosed. Among self-reported diagnosed young people living with HIV, 81.7% reported being on treatment. In HIV-positive young people reporting current treatment, 76.4% had VLS. In contrast, among people living with HIV aged 25 years and older, the percentages of reported prior HIV diagnosis (87.1%), reported diagnosed and currently on treatment (88.0%), and on current treatment with VLS (93.3%) were higher compared with young people (Table 10.3.A).

90-90-90 targets per self-reported HIV diagnosis, self-reported ART use, and ARV biomarker data

Among HIV-positive adults, 87.0% reported as diagnosed or had detectable ARVs in their blood (i.e., ARV-adjusted diagnosed) and was higher in females (90.7%) than in males (80.1%). Among adults living with HIV who were classified as ARV-adjusted diagnosed, 88.8% reported ART use or had detectable ARVs in their blood (i.e., ARV-adjusted on treatment; 90.2% in males and 88.1% in females). Among HIV-positive adults classified as ARV-adjusted on treatment, 91.4% had VLS: 90.5% in males and 91.8% in females (Table 10.3.B).

Among young people living with HIV aged 15-24 years, 72.1% were classified as ARV-adjusted diagnosed of whom 85.3% were classed as ARV-adjusted on treatment. Among these individuals on ART, 76.5% had VLS. Among HIV-positive adults aged 25 years and older, the percentages classified as ARV-adjusted diagnosed (88.9%), ARV-adjusted diagnosed and on treatment (89.2%), and ARV-adjusted diagnosed and on treatment with VLS (92.8%) were higher compared with young people aged 15-24 years (Table 10.3.B).

Table 10.3.A Adult 90-90-90, self-reported antiretroviral therapy (ART) data, conditional percentages

90-90-90 targets among people living with HIV aged 15 years and older, by sex and age, SHIMS2 2016-2017

Diagnosed[1]

	Males		Females		Total	
Age	Percentage who self-reported HIV positive	Number	Percentage who self-reported HIV positive	Number	Percentage who self-reported HIV positive	Number
15-24	51.5	68	70.2	268	66.1	336
25-34	65.7	220	88.9	708	82.4	928
35-49	83.1	438	93.4	711	89.5	1,149
15-29	51.3	149	78.5	586	72.2	735
20-39	69.1	432	87.4	1,222	82.1	1,654
25+	79.5	900	91.5	1,756	87.1	2,656
15-49	74.4	726	88.0	1,687	83.7	2,413
15+	77.5	968	88.6	2,024	84.7	2,992

On Treatment[2] Among Those Diagnosed

	Males		Females		Total	
Age	Percentage who self-reported on ART	Number	Percentage who self-reported on ART	Number	Percentage who self-reported on ART	Number
15-24	(90.9)	38	79.9	192	81.7	230
25-34	81.4	149	84.3	636	83.7	785
35-49	88.0	374	89.3	668	88.8	1,042
15-29	83.5	81	82.0	467	82.2	548
20-39	83.5	311	84.9	1,078	84.5	1,389
25+	88.5	738	87.8	1,619	88.0	2,357
15-49	86.2	561	86.1	1,496	86.1	2,057
15+	88.6	776	86.9	1,811	87.4	2,587

Viral Load Suppression (VLS), Among Those on Treatment

	Males		Females		Total	
Age	Percentage with VLS	Number	Percentage with VLS	Number	Percentage with VLS	Number
15-24	(61.3)	35	79.9	157	76.4	192
25-34	85.6	123	91.6	537	90.3	660
35-49	92.7	328	94.8	598	94.1	926
15-29	79.1	70	86.1	383	84.9	453
20-39	86.7	261	90.9	920	89.9	1,181
25+	92.9	659	93.6	1,430	93.3	2,089
15-49	88.6	486	91.8	1,292	90.9	1,778
15+	91.3	694	92.2	1,587	91.9	2,281

[1]Relates to Global AIDS Monitoring indicator (GAM) 1.1: People living with HIV who know their HIV status and PEPFAR indicator DIAGNOSED_NAT; [2]Relates to GAM 1.2: People living with HIV on antiretroviral therapy and PEPFAR indicator TX_CURR_NAT; [3]Relates to GAM 1.4: People living with HIV who have suppressed viral loads and PEPFAR indicator VL_SUPPRESSION_NAT.

Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.

Table 10.3.B Adult 90-90-90, self-reported antiretroviral therapy (ART) status and/or laboratory antiretroviral (ARV) data, conditional percentages

90-90-90 targets among people living with HIV aged 15 years and older, by sex and age, SHIMS2 2016-2017

Diagnosed[1]

Age	Males		Females		Total	
	Percentage who self-reported HIV positive AND/OR with detectable ARVs	Number	Percentage who self-reported HIV positive AND/OR with detectable ARVs	Number	Percentage who self-reported HIV positive AND/OR with detectable ARVs	Number
15-24	60.3	68	75.5	268	72.1	336
25-34	69.2	220	91.1	710	85.0	930
35-49	84.8	439	94.6	712	90.9	1,151
15-29	58.3	149	82.5	587	76.9	736
20-39	72.3	433	89.5	1,225	84.6	1,658
25+	81.6	902	93.1	1,759	88.9	2,661
15-49	77.3	727	90.2	1,690	86.1	2,417
15+	80.1	970	90.7	2,027	87.0	2,997

On Treatment[2] Among Those Diagnosed

Age	Males		Females		Total	
	Percentage with detectable ARVs AND/OR who self-reported being on ART	Number	Percentage with detectable ARVs AND/OR who self-reported being on ART	Number	Percentage with detectable ARVs AND/OR who self-reported being on ART	Number
15-24	(92.2)	44	83.7	204	85.3	248
25-34	84.3	156	85.5	651	85.2	807
35-49	89.9	381	90.4	677	90.2	1,058
15-29	86.7	91	84.9	488	85.2	579
20-39	85.8	324	86.3	1,104	86.2	1,428
25+	90.1	756	88.7	1,647	89.2	2,403
15-49	88.4	581	87.5	1,532	87.8	2,113
15+	90.2	800	88.1	1,851	88.8	2,651

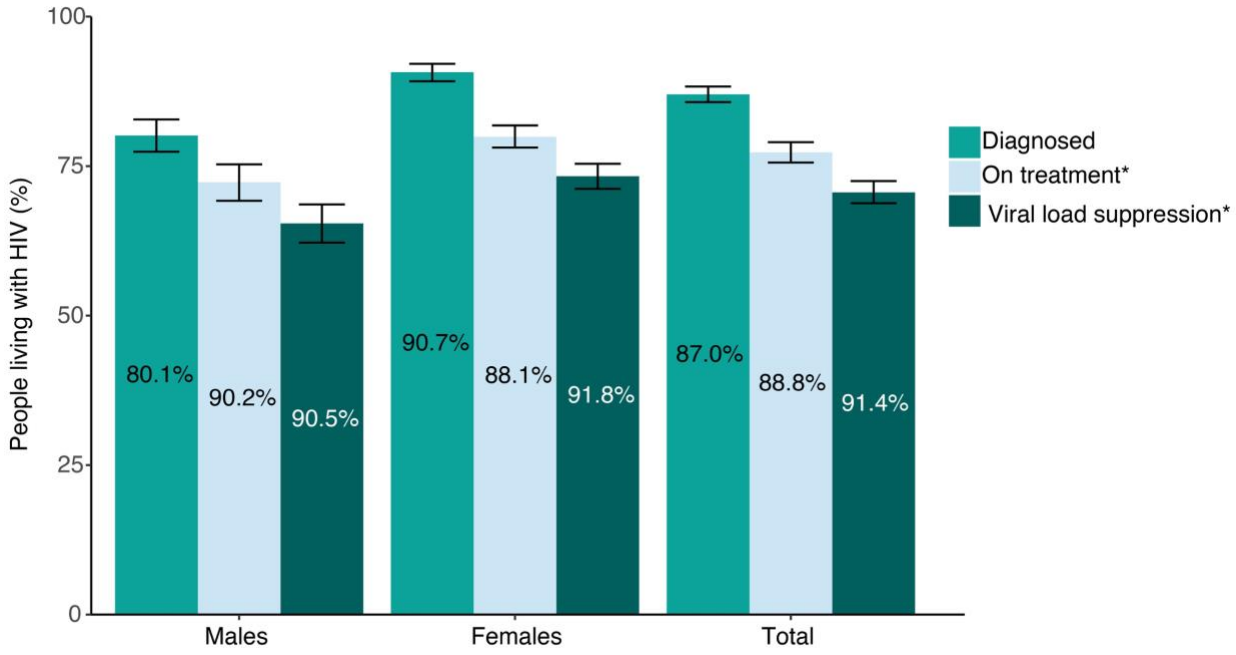
Viral Load Suppression (VLS), Among Those on Treatment

Age	Males		Females		Total	
	Percentage with VLS	Number	Percentage with VLS	Number	Percentage with VLS	Number
15-24	(57.6)	41	81.2	173	76.5	214
25-34	85.0	133	91.2	557	89.9	690
35-49	92.4	342	94.1	612	93.5	954
15-29	76.3	81	86.3	413	84.5	494
20-39	85.6	279	90.5	956	89.3	1,235
25+	92.5	687	93.0	1,468	92.8	2,155
15-49	87.6	516	91.4	1,342	90.3	1,858
15+	90.5	728	91.8	1,641	91.4	2,369

[1]Relates to Global AIDS Monitoring indicator (GAM) 1.1: People living with HIV who know their HIV status and PEPFAR indicator DIAGNOSED_NAT; [2]Relates to GAM 1.2: People living with HIV on antiretroviral therapy and PEPFAR indicator TX_CURR_NAT; [3]Relates to GAM 1.4: People living with HIV who have suppressed viral loads and PEPFAR indicator VL_SUPPRESSION_NAT.

Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.

Figure 10.3.A Adults aged 15 years and older 90-90-90, adjusted for laboratory antiretroviral data,[1] SHIMS2 2016-2017



[1]In the antiretroviral (ARV)-adjusted 90-90-90, participants are classified as 'Aware' or 'Diagnosed' if they reported being aware of their HIV-positive status before testing positive in SHIMS2 and/or had detectable ARVs in their blood. Participants are classified as 'On Treatment' if they reported that they were on treatment and/or if they had detectable ARVs in their blood.
*Inset numbers are conditional proportions.

10.4 Gaps and Unmet Needs

- Among HIV-positive adults, the percentage of males with a prior HIV diagnosis is notably lower than females, yet no comparable gap is shown in current ART use or in VLS. Efforts to target HIV testing toward men who are at risk of HIV infection are warranted.
- Young people aged 15-24 years who are living with HIV have notably lower percentages of prior HIV diagnosis and VLS. It is key for efforts to target HIV testing toward young people and to support ART retention among them.

10.5 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. http://www.unaids.org/sites/default/files/media_asset/90-90-90_en_0.pdf. Accessed December 20, 2018.

11 Clinical Characteristics of People Living with HIV

11.1 Key Findings

- Less than half (44.7%) of HIV-positive adults aged 15 years and older were immunosuppressed with a CD4+ T-cell (CD4) count of less than 500 cells/microliter (µL). Severe immunosuppression with a CD4 count of less than 100 cells/µL was uncommon (2.2%).
- About two-fifths (38.9%) of adults living with HIV aged 15 years and older who reported as unaware of their HIV-positive status had a late HIV diagnosis with CD4 count less than 350 cells/µL (42.4% males, 35.0% females).
- All HIV-positive adults aged 15 years and older who initiated ART within 12 months of the survey and virtually all people living with HIV who ever initiated ART reported currently being on ART at the time of the survey (100% and 99.1%, respectively).
- Five of 28 samples (17.9%) from recently infected HIV-positive adults aged 15 years and older in the survey had mutations associated with resistance to only one class of ARVs, non-nucleoside reverse transcriptase inhibitors.

11.2 Background

The quality of HIV care and treatment is based on key principles of accessibility, efficiency, and safety. As countries implement treatment for all HIV-positive people, ensuring a sustainable health system that is people-centered and innovative requires diligent monitoring and responsiveness.[1] 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 among people living with HIV also reflects population health, and the potential impact of HIV on mortality. Finally, the measurement of transmitted drug resistance informs optimization of national ART guidelines, including second- and third-line therapies. These measures provide a unique opportunity to gauge progress in the expansion of HIV clinical services in Eswatini, as well as identify gaps and future challenges.

11.3 CD4 Counts and Immunosuppression

Among HIV-positive adults (defined in this survey as those aged 15 years and older, unless otherwise noted), 44.7% were immunosuppressed with a CD4 count of less than 500 cells/µL. Immunosuppression was higher in males (59.2%) than in females (37.1%). The median CD4 count was 534 cells/µL in adults living with HIV (438 cells/µL in males and 587 cells/µL in females). The percentage of HIV-positive adults with CD4 counts less than 100 cells/µL did not meaningfully vary by demographic characteristics (Tables 11.3.A and 11.3.B).

Among adults living with HIV who reported a prior HIV diagnosis and ART use, 40.2% had a CD4 count of less than 500 cells/µL (56.4% in males and 32.6% in females). The median CD4 count was 560 cells/µL (456 cells/µL in males and 616 cells/µL in females). Among HIV-positive adults who reported a prior HIV diagnosis and no ART use, 55.8% had a CD4 count of less than 500 cells/µL (67.7% in males and 51.1% in

females). The median CD4 count was 452 cells/µL (373 cells/µL in males and 488 cells/µL in females; Tables 11.3.A and 11.3.B, Figure 11.3.A).

Among adults living with HIV, 2.2% were severely immunosuppressed with a CD4 count of less than 100 cells/µL (3.2% in males and 1.7% in females). Severe immunosuppression was highest in adults who reported a prior HIV diagnosis and no ART use (5.0%) and lowest in adults who reported a prior HIV diagnosis and ART use (1.8%). Among adults who reported a prior HIV diagnosis and no ART use, severe immunosuppression was over five times higher in males (11.8%) than in females (2.3%; Table 11.3.A).

Among HIV-positive adults aged 15-24 years, 40.2% were immunosuppressed with a CD4 count of less than 500 cells/µL and 2.4% were severely immunosuppressed with a CD4 count of less than 100 cells/µL. The median CD4 count was 576 cells/µL (Tables 11.3.A and 11.3.B).

Figure 11.3.A CD4 count distribution among HIV-positive adults aged 15 years and older, by antiretroviral treatment (ART) status, SHIMS2 2016-2017

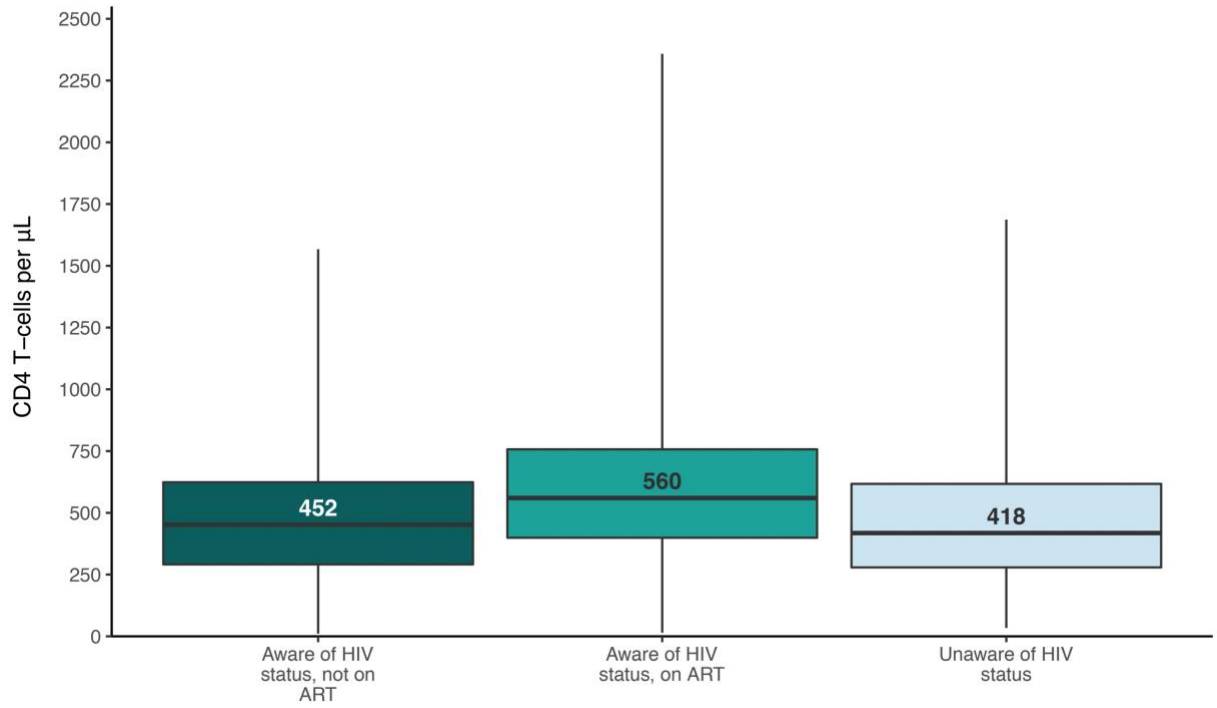


Table 11.3.A Prevalence of immunosuppression

Among HIV-positive adults aged 15 years and older, percentage with immunosuppression (< 100 cells/μL[1]; <200 cells/μL; <500 cells/μL), by sex, self-reported diagnosis and antiretroviral therapy (ART) status, and selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Males				Females				Total			
	Percentage < 100 cells/μL	Percentage < 200 cells/μL	Percentage < 500 cells/μL	Number	Percentage < 100 cells/μL	Percentage < 200 cells/μL	Percentage < 500 cells/μL	Number	Percentage < 100 cells/μL	Percentage < 200 cells/μL	Percentage < 500 cells/μL	Number
Self-reported diagnosis and treatment status												
Not previously diagnosed	1.7	14.1	64.6	192	2.4	12.3	53.2	212	2.1	13.2	59.0	404
Previously diagnosed, not on ART	11.8	18.9	67.7	82	2.3	10.9	51.1	224	5.0	13.2	55.8	306
Previously diagnosed, on ART	2.5	9.4	56.4	694	1.4	3.8	32.6	1,586	1.8	5.6	40.2	2,280
Missing	*	*	*	4	*	*	*	6	*	*	*	10
Residence												
Urban	2.1	12.0	58.0	257	2.4	6.5	35.2	467	2.3	8.5	43.3	724
Rural	3.7	11.1	59.7	715	1.3	5.2	37.8	1,561	2.1	7.2	45.3	2,276
Region												
Hhohho	2.9	10.0	60.2	295	1.4	5.8	36.4	577	1.9	7.3	45.0	872
Lubombo	3.2	16.3	61.3	240	1.8	4.9	33.4	431	2.4	9.3	44.0	671
Manzini	3.0	8.9	55.6	292	2.1	5.9	39.3	639	2.4	6.9	44.8	931
Shiselweni	4.5	12.4	62.3	145	1.0	5.3	37.8	381	2.0	7.3	44.9	526
Marital status												
Never married	3.7	12.1	60.3	282	2.5	7.2	38.5	728	2.9	8.6	44.9	1,010
Married	2.7	10.2	58.9	508	1.2	4.1	37.0	748	1.8	6.7	46.3	1,256
Living together	4.8	12.6	54.6	69	1.5	5.9	30.5	125	2.8	8.5	39.9	194
Divorced/separated	1.7	10.2	56.5	77	1.6	3.2	29.5	124	1.6	5.8	39.7	201
Widowed	(4.2)	(20.5)	(69.8)	34	0.6	6.2	40.4	287	1.0	7.9	43.9	321
Type of union												
In polygynous union	(0.0)	(8.4)	(69.0)	42	0.8	2.3	35.2	82	0.5	4.4	46.9	124
Not in polygynous union	3.1	10.6	57.3	522	1.1	4.5	36.2	735	2.0	7.2	45.5	1,257
Not currently in union	3.3	12.4	60.3	393	2.0	6.5	37.8	1,139	2.4	8.1	44.0	1,532
Don't know/missing	*	*	*	15	2.7	5.4	36.9	72	4.4	7.6	42.7	87
Education												
No education	2.8	11.3	61.5	74	0.0	2.8	32.1	151	1.0	5.9	42.6	225
Primary	2.6	9.7	60.0	379	1.1	5.2	35.9	692	1.6	6.9	45.1	1,071
Secondary	5.1	14.9	60.4	247	2.1	5.7	38.2	658	3.0	8.3	44.6	905
High school	3.1	11.6	58.2	221	1.9	6.5	38.9	414	2.3	8.3	45.9	635
Tertiary	(0.0)	(5.0)	(49.6)	46	3.0	6.6	34.1	109	2.0	6.1	39.3	155

Table 11.3.A Prevalence of immunosuppression (continued)

Among HIV-positive adults aged 15 years and older, percentage with immunosuppression (< 100 cells/μL[1]; <200 cells/μL; <500 cells/μL), by sex, self-reported diagnosis and antiretroviral therapy (ART) status, and selected demographic characteristics, SHIMS2 2016-2017

	Males				Females				Total			
Characteristic	Percentage < 100 cells/μL	Percentage < 200 cells/μL	Percentage < 500 cells/μL	Number	Percentage < 100 cells/μL	Percentage < 200 cells/μL	Percentage < 500 cells/μL	Number	Percentage < 100 cells/μL	Percentage < 200 cells/μL	Percentage < 500 cells/μL	Number
Wealth quintile												
Lowest	3.4	10.9	62.5	235	1.3	6.0	38.2	515	2.0	7.7	46.5	750
Second	4.0	11.3	60.9	214	1.8	5.2	32.3	437	2.6	7.3	42.3	651
Middle	2.1	12.5	54.1	205	1.7	5.8	41.6	455	1.8	8.1	45.8	660
Fourth	4.3	13.0	64.2	169	1.2	5.6	35.6	355	2.2	8.1	45.2	524
Highest	1.8	8.5	53.0	148	2.4	4.9	37.4	264	2.2	6.2	43.2	412
Age												
15-19	(1.6)	(8.2)	(61.1)	40	2.5	11.4	32.2	72	2.2	10.3	42.3	112
20-24	(6.3)	(14.9)	(58.6)	29	1.8	7.7	35.5	197	2.5	8.9	39.2	226
25-29	2.2	6.9	46.6	81	2.4	5.9	37.1	319	2.4	6.2	39.4	400
30-34	4.6	13.1	64.9	139	1.5	4.6	38.2	392	2.5	7.2	46.3	531
35-39	5.5	17.8	62.1	184	1.4	4.5	36.9	319	2.9	9.2	45.8	503
40-44	2.5	9.2	59.6	133	1.4	6.0	34.4	224	1.8	7.2	43.5	357
45-49	3.1	8.2	56.1	123	1.0	5.6	42.3	169	2.0	6.8	48.3	292
50-54	0.7	9.2	63.3	84	2.0	2.8	42.3	135	1.4	5.7	51.8	219
55-59	1.8	10.8	49.7	58	0.0	3.1	33.2	90	0.8	6.6	40.6	148
60-64	0.0	11.2	60.6	53	3.9	7.4	38.7	67	1.7	9.5	51.0	120
65+	(1.6)	(7.8)	(62.2)	48	(0.0)	(8.6)	(26.7)	44	1.0	8.1	49.4	92
15-29	3.0	8.9	52.3	150	2.2	7.2	36.0	588	2.4	7.6	39.8	738
20-39	4.6	13.8	59.6	433	1.8	5.4	37.1	1,227	2.6	7.8	43.5	1,660
25+	3.2	11.3	59.1	903	1.6	5.1	37.5	1,759	2.2	7.3	45.3	2,662
Total 15-24	4.0	11.6	59.9	69	2.0	8.7	34.7	269	2.4	9.3	40.2	338
Total 15-49	3.9	11.8	59.1	729	1.7	5.8	37.0	1,692	2.4	7.7	44.0	2,421
Total 15+	3.2	11.4	59.2	972	1.7	5.6	37.1	2,028	2.2	7.6	44.7	3,000

[1] μL: microliter

Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.

Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed.

The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

The interquartile range (IQR) is a measure of variability, based on dividing a data set into quartiles. Quartiles divide a rank-ordered data set into four equal parts. The values that divide each part are called the first, second, and third quartiles; and they are denoted by Q1, Q2, and Q3, respectively.

Table 11.3.B Median CD4 count and prevalence of immunosuppression

Among HIV-positive adults aged 15 years and older, median (Q1, Q3) CD4 count and percentage with immunosuppression (< 100 cells/μL[1]), by sex, self-reported diagnosis and ART status, and selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Males			Females			Total		
	Median (Q1, Q3)	Percentage < 100 cells/μL	Number	Median (Q1, Q3)	Percentage < 100 cells/μL	Number	Median (Q1, Q3)	Percentage < 100 cells/μL	Number
Self-reported diagnosis and treatment status									
Not previously diagnosed	409 (266, 586)	1.7	192	438 (295, 697)	2.4	212	418 (279, 617)	2.1	404
Previously diagnosed, not on ART	373 (240, 523)	11.8	82	488 (309, 663)	2.3	224	452 (291, 624)	5.0	306
Previously diagnosed, on ART	456 (324, 630)	2.5	694	616 (447, 804)	1.4	1,586	560 (399, 757)	1.8	2,280
Missing	*	*	4	*	*	6	*	*	10
Residence									
Urban	440 (308, 621)	2.1	257	604 (397, 791)	2.4	467	557 (358, 731)	2.3	724
Rural	437 (308, 596)	3.7	715	576 (414, 780)	1.3	1,561	525 (362, 729)	2.1	2,276
Region									
Hhohho	438 (306, 611)	2.9	295	578 (409, 777)	1.4	577	533 (351, 737)	1.9	872
Lubombo	409 (287, 567)	3.2	240	592 (440, 768)	1.8	431	524 (357, 711)	2.4	671
Manzini	457 (326, 632)	3.0	292	590 (385, 790)	2.1	639	539 (362, 729)	2.4	931
Shiselweni	435 (291, 570)	4.5	145	589 (423, 786)	1.0	381	541 (384, 740)	2.0	526
Marital status									
Never married	422 (281, 578)	3.7	282	586 (387, 782)	2.5	728	539 (351, 716)	2.9	1,010
Married	448 (319, 627)	2.7	508	590 (412, 776)	1.2	748	520 (358, 722)	1.8	1,256
Living together	485 (306, 655)	4.8	69	604 (437, 768)	1.5	125	565 (364, 742)	2.8	194
Divorced/separated	459 (321, 581)	1.7	77	656 (475, 861)	1.6	124	553 (395, 794)	1.6	201
Widowed	366 (229, 518)	(4.2)	34	544 (417, 745)	0.6	287	531 (382, 731)	1.0	321
Type of union									
In polygynous union	376 (306, 575)	(0.0)	42	623 (361, 802)	0.8	82	532 (323, 726)	0.5	124
Not in polygynous union	457 (319, 634)	3.1	522	589 (417, 764)	1.1	735	524 (359, 729)	2.0	1,257
Not currently in union	425 (284, 576)	3.3	393	580 (410, 790)	2.0	1,139	541 (360, 730)	2.4	1,532
Don't know/missing	*	*	15	577 (435, 780)	2.7	72	547 (396, 728)	4.4	87
Education									
No education	427 (315, 584)	2.8	74	604 (452, 755)	0.0	151	549 (367, 711)	1.0	225
Primary	436 (320, 579)	2.6	379	585 (424, 790)	1.1	692	527 (361, 728)	1.6	1,071
Secondary	435 (254, 601)	5.1	247	589 (411, 784)	2.1	658	540 (362, 734)	3.0	905
High school	451 (327, 605)	3.1	221	572 (390, 766)	1.9	414	522 (352, 723)	2.3	635
Tertiary	484 (311, 716)	(0.0)	46	621 (412, 810)	3.0	109	579 (380, 763)	2.0	155
Wealth quintile									
Lowest	444 (326, 559)	3.4	235	573 (423, 782)	1.3	515	519 (371, 712)	2.0	750
Second	420 (307, 597)	4.0	214	625 (438, 825)	1.8	437	553 (361, 758)	2.6	651
Middle	464 (287, 660)	2.1	205	558 (377, 742)	1.7	455	527 (357, 722)	1.8	660
Fourth	413 (297, 563)	4.3	169	606 (412, 787)	1.2	355	534 (354, 728)	2.2	524
Highest	478 (308, 703)	1.8	148	560 (414, 739)	2.4	264	541 (358, 713)	2.2	412

Table 11.3.B Median CD4 count and prevalence of immunosuppression (continued)

Among HIV-positive adults aged 15 years and older, median (Q1, Q3) CD4 count and percentage with immunosuppression (< 100 cells/μL[1]), by sex, self-reported diagnosis and ART status, and selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Males			Females			Total		
	Median (Q1, Q3)	Percentage < 100 cells/μL	Number	Median (Q1, Q3)	Percentage < 100 cells/μL	Number	Median (Q1, Q3)	Percentage < 100 cells/μL	Number
Age									
15-19	399 (279, 588)	(1.6)	40	671 (372, 923)	2.5	72	574 (345, 853)	2.2	112
20-24	434 (304, 543)	(6.3)	29	606 (402, 790)	1.8	197	577 (373, 744)	2.5	226
25-29	502 (345, 636)	2.2	81	597 (406, 801)	2.4	319	574 (389, 757)	2.4	400
30-34	405 (297, 564)	4.6	139	582 (400, 753)	1.5	392	533 (360, 716)	2.5	531
35-39	428 (257, 618)	5.5	184	569 (438, 742)	1.4	319	519 (353, 702)	2.9	503
40-44	465 (340, 600)	2.5	133	595 (435, 798)	1.4	224	528 (392, 718)	1.8	357
45-49	452 (331, 579)	3.1	123	552 (352, 758)	1.0	169	507 (344, 698)	2.0	292
50-54	425 (276, 613)	0.7	84	569 (365, 779)	2.0	135	489 (330, 731)	1.4	219
55-59	496 (307, 603)	1.8	58	658 (439, 876)	0.0	90	548 (369, 775)	0.8	148
60-64	398 (284, 660)	0.0	53	546 (368, 759)	3.9	67	493 (312, 683)	1.7	120
65+	388 (303, 566)	(1.6)	48	561 (484, 688)	(0.0)	44	500 (331, 622)	1.0	92
15-29	455 (330, 610)	3.0	150	602 (404, 816)	2.2	588	575 (374, 765)	2.4	738
20-39	430 (292, 607)	4.6	433	585 (413, 768)	1.8	1,227	543 (366, 732)	2.6	1,660
25+	439 (310, 608)	3.2	903	579 (412, 776)	1.6	1,759	527 (360, 722)	2.2	2,662
Total 15-24	424 (301, 577)	4.0	69	610 (399, 851)	2.0	269	576 (360, 781)	2.4	338
Total 15-49	437 (314, 600)	3.9	729	585 (412, 781)	1.7	1,692	536 (365, 731)	2.4	2,421
Total 15+	438 (309, 603)	3.2	972	587 (412, 782)	1.7	2,028	534 (360, 730)	2.2	3,000

[1] μL: microliter

The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.

Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed.

11.4 Late HIV Diagnosis

Late HIV diagnosis is defined as having a CD4 count less than 350 cells/µL, tested HIV positive in SHIMS2, and self-reported as HIV negative. Among adults who tested HIV positive in SHIMS2 but reported being HIV negative, nearly two-fifths (38.9%) had a CD4 count less than 350 cells/µL (42.4% in males and 35.0% in females) and 13.4% had a CD4 count less than 200 cells/µL (14.0% in males and 12.8% in females).

Among adults living with HIV, who reported not being aware of their HIV-positive status, immunosuppression with CD4 count less than 350 cells/µL was higher in rural areas (43.3%) than in urban areas (31.9%) and immunosuppression with CD4 count less than 200 cells/µL was more comparable between rural (12.8%) and urban (14.5%) areas.

Among young people aged 15-24 years who tested HIV positive in SHIMS2 but reported being HIV negative, 39.0% had a CD4 count less than 350 cells/µL and 11.9% had a CD4 count less than 200 cells/µL (Table 11.4.A).

Table 11.4.A Late HIV diagnosis

Among adults aged 15 years and older, who tested HIV positive in the PHIA survey but reported HIV negative, percentage who had a CD4 cell count < 200 cells/μL[1] and < 350 cells/μL, by sex and selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Males			Females			Total		
	Percentage < 200 cells/μL[2]	Percentage < 350 cells/μL[2]	Number	Percentage < 200 cells/μL[2]	Percentage < 350 cells/μL[2]	Number	Percentage < 200 cells/μL[2]	Percentage < 350 cells/μL[2]	Number
Residence									
Urban	14.8	33.9	59	14.0	29.3	52	14.5	31.9	111
Rural	13.4	48.2	111	12.1	38.1	123	12.8	43.3	234
Region									
Hhohho	14.8	45.6	64	14.0	33.5	66	14.4	39.8	130
Lubombo	(27.4)	(54.7)	28	(5.3)	(30.4)	32	16.5	42.7	60
Manzini	6.0	30.7	62	15.6	38.9	52	10.1	34.1	114
Shiselweni	*	*	16	(11.5)	(34.7)	25	(17.7)	(47.9)	41
Marital status									
Never married	11.6	40.8	82	13.9	29.8	95	12.7	35.3	177
Married	18.7	46.3	59	(6.7)	(43.4)	43	13.9	45.2	102
Living together	*	*	14	*	*	14	(3.4)	(29.9)	28
Divorced/separated	*	*	12	*	*	16	(18.5)	(46.6)	28
Widowed	*	*	3	*	*	6	*	*	9
Type of union									
In polygynous union	*	*	6	*	*	8	*	*	14
Not in polygynous union	14.8	37.8	62	(9.1)	(41.3)	44	12.6	39.1	106
Not currently in union	14.0	44.1	97	14.9	30.5	117	14.5	37.2	214
Don't know/missing	*	*	5	*	*	6	*	*	11
Education									
No education	*	*	9	*	*	7	*	*	16
Primary	12.2	44.0	58	(15.5)	(36.6)	45	13.4	41.3	103
Secondary	(16.5)	(42.8)	48	13.4	38.8	56	15.0	40.8	104
High school	(12.1)	(40.4)	48	15.6	42.2	53	13.8	41.3	101
Tertiary	*	*	7	*	*	13	*	*	20
Wealth quintile									
Lowest	(22.3)	(46.1)	37	(11.2)	(24.9)	31	18.0	37.8	68
Second	(18.1)	(53.3)	37	(12.5)	(40.5)	35	15.6	47.5	72
Middle	(10.8)	(32.7)	39	12.5	32.9	50	11.7	32.8	89
Fourth	(5.8)	(36.0)	31	(17.5)	(42.5)	30	11.1	39.0	61
Highest	(13.1)	(44.6)	26	(9.7)	(32.1)	29	11.4	38.1	55
Age									
15-19	*	*	9	*	*	21	(12.4)	(35.8)	30
20-24	*	*	15	(12.4)	(39.0)	43	11.7	40.4	58
25-29	(4.8)	(27.9)	34	(3.8)	(20.0)	35	4.3	24.2	69
30-34	(15.5)	(38.7)	30	*	*	23	9.5	31.2	53
35-39	(26.3)	(50.7)	30	*	*	19	(22.3)	(48.3)	49
40-44	*	*	18	*	*	11	(19.8)	(52.1)	29
45-49	*	*	10	*	*	5	*	*	15
50-54	*	*	9	*	*	7	*	*	16
55-59	*	*	6	*	*	3	*	*	9
60-64	*	*	4	*	*	5	*	*	9
65+	*	*	5	*	*	3	*	*	8
15-29	5.7	35.1	58	10.3	30.2	99	8.4	32.2	157
20-39	13.9	38.9	109	8.2	30.7	120	11.1	34.9	229
25+	15.2	41.8	146	12.0	34.4	111	13.9	38.9	257
Total 15-24	*	*	24	14.0	36.1	64	11.9	39.0	88
Total 15-49	13.9	41.1	146	12.2	34.8	157	13.1	38.1	303
Total 15+	14.0	42.4	170	12.8	35.0	175	13.4	38.9	345

[1] μL: microliter

[2]Relates to Global AIDS Monitoring indicator 1.5: Late HIV diagnosis.

The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.
Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.

11.5 Retention on Antiretroviral Therapy

Among HIV-positive adults who initiated ART less than 12 months prior to the survey, 100% reported continued ART use at the time of the survey. All (100.0%) people living with HIV with detectable ARVs reported they were still on ART (Table 11.5.A).

Among HIV-positive adults who initiated ART 12 months or more prior to the survey, 99.1% reported continued ART at the time of the survey. Nearly all (99.8%) people living with HIV with detectable ARVs reported they were still on ART compared to 81.5% of people with no detectable ARVs (Table 11.5.B).

Table 11.5.A Retention on antiretroviral therapy (ART): HIV-positive adults who reported being on ART less than 12 months prior to the survey

Among HIV-positive adults aged 15 years and older who reported initiating ART less than 12 months prior to the survey, percentage who reported still receiving ART, by sex and selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Males		Females		Total	
	Percentage still receiving ART[1]	Number	Percentage still receiving ART[1]	Number	Percentage still receiving ART[1]	Number
Presence of detectable ARVs						
Detectable	100.0	109	100.0	246	100.0	355
Not detectable	*	7	*	19	(100.0)	26
Residence						
Urban	(100.0)	27	100.0	61	100.0	88
Rural	100.0	89	100.0	204	100.0	293
Region						
Hhohho	(100.0)	33	100.0	73	100.0	106
Lubombo	(100.0)	29	100.0	70	100.0	99
Manzini	(100.0)	40	100.0	78	100.0	118
Shiselweni	*	14	(100.0)	44	100.0	58
Marital status						
Never married	(100.0)	38	100.0	102	100.0	140
Married	100.0	55	100.0	100	100.0	155
Living together	*	6	*	12	*	18
Divorced/separated	*	9	*	20	(100.0)	29
Widowed	*	6	(100.0)	28	(100.0)	34
Type of union						
In polygynous union	*	4	*	7	*	11
Not in polygynous union	100.0	56	100.0	99	100.0	155
Not currently in union	100.0	53	100.0	150	100.0	203
Don't know/missing	*	3	*	9	*	12
Education						
No education	*	6	*	18	*	24
Primary	(100.0)	46	100.0	81	100.0	127
Secondary	(100.0)	34	100.0	109	100.0	143
High school	*	24	(100.0)	46	100.0	70
Tertiary	*	5	*	10	*	15
Wealth quintile						
Lowest	(100.0)	34	100.0	71	100.0	105
Second	*	15	100.0	63	100.0	78
Middle	*	20	100.0	63	100.0	83
Fourth	(100.0)	32	(100.0)	40	100.0	72
Highest	*	15	(100.0)	26	(100.0)	41
Age						
15-19	*	2	*	14	*	16
20-24	*	3	(100.0)	38	(100.0)	41
25-29	*	12	100.0	50	100.0	62
30-34	*	22	100.0	55	100.0	77
35-39	(100.0)	25	(100.0)	37	100.0	62
40-44	*	17	(100.0)	27	(100.0)	44
45-49	*	16	*	15	(100.0)	31
50-54	*	7	*	11	*	18
55-59	*	7	*	10	*	17
60-64	*	4	*	3	*	7
65+	*	1	*	5	*	6
15-29	*	17	100.0	102	100.0	119
20-39	100.0	62	100.0	180	100.0	242
25+	100.0	111	100.0	213	100.0	324
Total 15-24	*	5	100.0	52	100.0	57
Total 15-49	100.0	97	100.0	236	100.0	333
Total 15+	100.0	116	100.0	265	100.0	381

[1] Relates to Global AIDS Monitoring indicator 1.3: Retention on antiretroviral therapy at 12 months.

Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.

Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed. The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

Table 11.5.B Retention on antiretroviral therapy (ART): HIV-positive adults who reported being on ART 12 months or more prior to the survey

Among HIV-positive adults aged 15 years and older who reported initiating ART 12 months or more prior to the survey, percentage who reported still receiving ART, by sex and selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Males		Females		Total	
	Percentage still receiving ART[1]	Number	Percentage still receiving ART[1]	Number	Percentage still receiving ART[1]	Number
Presence of detectable ARVs						
Detectable	99.8	553	99.9	1,251	99.8	1,804
Not detectable	*	17	80.2	55	81.5	72
Residence						
Urban	97.2	134	98.3	276	98.0	410
Rural	100.0	436	99.3	1,033	99.5	1,469
Region						
Hhohho	99.3	175	99.3	362	99.3	537
Lubombo	98.3	140	98.8	269	98.6	409
Manzini	100.0	157	99.1	410	99.3	567
Shiselweni	99.2	98	98.7	268	98.8	366
Marital status						
Never married	99.0	123	99.3	408	99.2	531
Married	99.7	337	99.0	510	99.3	847
Living together	(100.0)	38	100.0	84	100.0	122
Divorced/separated	96.4	52	97.5	70	97.0	122
Widowed	*	20	99.1	228	99.2	248
Type of union						
In polygynous union	(100.0)	26	98.2	58	98.7	84
Not in polygynous union	99.7	343	99.1	499	99.4	842
Not currently in union	98.4	195	99.0	706	98.9	901
Don't know/missing	*	6	(98.2)	46	98.4	52
Education						
No education	100.0	52	99.5	111	99.7	163
Primary	99.0	241	99.6	478	99.4	719
Secondary	100.0	123	98.5	407	98.8	530
High school	98.5	122	98.4	248	98.4	370
Tertiary	(100.0)	28	100.0	64	100.0	92
Wealth quintile						
Lowest	100.0	147	98.8	350	99.2	497
Second	99.4	135	98.7	295	98.9	430
Middle	100.0	119	99.4	277	99.6	396
Fourth	98.7	85	99.2	222	99.1	307
Highest	97.6	83	99.0	165	98.5	248
Age						
15-19	*	21	*	23	(100.0)	44
20-24	*	8	97.4	80	97.7	88
25-29	*	23	98.6	177	98.8	200
30-34	98.4	67	98.4	257	98.4	324
35-39	99.2	98	100.0	223	99.8	321
40-44	98.8	85	98.9	166	98.9	251
45-49	98.5	82	100.0	123	99.4	205
50-54	100.0	60	98.0	107	98.8	167
55-59	(100.0)	43	100.0	66	100.0	109
60-64	(100.0)	45	98.4	55	99.3	100
65+	(100.0)	38	(100.0)	32	100.0	70
15-29	100.0	52	98.4	280	98.7	332
20-39	99.1	196	98.9	737	98.9	933
25+	99.2	541	99.1	1,206	99.1	1,747
Total 15-24	(100.0)	29	98.0	103	98.5	132
Total 15-49	99.0	384	99.0	1,049	99.0	1,433
Total 15+	99.3	570	99.0	1,309	99.1	1,879

[1]Relates to Global AIDS Monitoring indicator 1.3: Retention on antiretroviral therapy at 12 months.

Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution. Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed. The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

11.6 Transmitted Resistance to Antiretrovirals

Among 28 samples from recently infected HIV-positive adults, 80.8% were successfully amplified. Among the amplified samples, five had evidence of resistance to ARVs. All had mutations associated with resistance to non-nucleoside reverse transcriptase inhibitors. None had mutations associated with resistance to nucleoside reverse transcriptase inhibitors or to protease inhibitors (Table 11.6.A). Among the subset of samples that underwent genotyping, 98.9% were Subtype C. One sample was a recombinant genotype (Table 11.6.B).

Table 11.6.A Resistance to antiretrovirals

Among persons aged 15 years and older who were recently infected with HIV, percentage with resistance to antiretrovirals (ARVs), by class of ARV, SHIMS2 2016-2017

	Percent	Number	DR Mutations Detected[1]
Successfully amplified[2]	(80.8)	28	
Any	*	5	G190A, K101KE, K103N, V106M, Y188L
NRTI	*	0	
NNRTI	*	5	G190A, K101KE, K103N, V106M, Y188L
PI	*	0	
NRTI & NNRTI	*	0	
NRTI, NNRTI & PI	*	0	

[1]Based on *Stanford Database for HIV Drug Resistance Mutation. https://hivdb.stanford.edu/assets/media/resistance-mutation-handout-Dec2017.b8f72e32.pdf*.
[2]Unweighted figures, from a total of 22 cases.
NRTI: Nucleoside Reverse Transcriptase Inhibitors
NNRTI: Non-Nucleoside Reverse Transcriptase Inhibitors
PI: Protease inhibitor
Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.
Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed.

Table 11.6.B HIV subtype

Percent distribution of HIV-positive persons aged 15 years and older who underwent genotyping, by HIV Subtype, SHIMS2 2016-2017

	Total	
	Percent	Number
Subtype A	*	0
Subtype B	*	0
Subtype C	98.9	92
Subtype D	*	0
Subtype G	*	0
Recombinant	*	1
Total	100.0	93

Unweighted figures; estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed.

11.7 Gaps and Unmet Needs

- Late HIV diagnosis continues despite achievements in HIV diagnosis among adults living with HIV. Strengthening HIV diagnosis and treatment among men who are likely to present late is needed.
- Prevalence of drug resistance to non-nucleoside reverse transcriptase inhibitors may exceed the WHO recommended threshold of 10% for removing a first-line regimen from the national formulary. Further information is needed to determine whether a shift is warranted.

11.8 References

1. World Health Organization. *Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection.* Geneva: World Health Organization; 2016. http://www.who.int/hiv/pub/arv/arv-2016/en/. Accessed December 20, 2018.

12 Prevention of Mother-to-Child Transmission

12.1 Key Findings

- Nearly all (99.4%) mothers aged 15-49 years, who delivered in the three years prior to the survey, attended at least one antenatal care (ANC) visit during their pregnancy.
- Among mothers aged 15-49 years who gave birth within the prior three years, the percentage of mothers who never breastfed and tested HIV positive (11.5%) was almost three times higher than in mothers who never breastfed and tested HIV negative (4.3%).
- Among mothers aged 15-49 years who gave birth during the 12 months prior to the survey, 98.4% reported knowing their HIV status before delivery: 30.2% were diagnosed as HIV positive before ANC, 6.4% were newly diagnosed as HIV positive in ANC, and 61.8% tested HIV negative in ANC.
- Among HIV-positive mothers aged 15-49 years who gave birth during the 12 months prior to the survey, 56.1% were on ARVs prior to pregnancy, and 34.0% were newly initiated onto ARVs during pregnancy, labor, or delivery.
- More than a tenth (12.8%) of infants aged 0-17 months, born to HIV-positive mothers aged 15-49 years in the 17 months prior to the survey, were confirmed HIV positive by virologic testing.

12.2 Background

Pregnant women living with HIV are at high risk of transmitting HIV to their infants during pregnancy, during birth, and through breastfeeding. Over 90% of new infections among infants and young children occur through mother-to-child transmission of HIV (MTCT). Without any interventions, between 20% and 45% of infants may become infected, with an estimated risk of 5-10% during pregnancy, 10-20% during labor and delivery, and 5-20% 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 MTCT.[2]

To prevent MTCT, the United Nations recommends a comprehensive four-pronged approach including: (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.[2]

This chapter describes ANC attendance, breastfeeding practices, awareness of a woman's HIV status prior to or during pregnancy, use of ART during pregnancy in women who were aware of their HIV-positive status during pregnancy, and infant HIV testing conducted during the survey.

12.3 Antenatal Care Attendance

Among mothers aged 15-49 years who delivered in the three years preceding the survey, nearly all (99.4%) attended at least one ANC visit during their pregnancy. ANC attendance was comparable across regions, marital status, wealth quintile, and age. Among mothers aged 15-49 years who delivered in the

prior three years, ANC attendance was lowest in polygynous unions (95.9%) and in those with no education (95.7%; Table 12.3.A).

Table 12.3.A Antenatal care

Among women aged 15-49 years who delivered in the three years preceding the survey, percentage who attended at least one antenatal care visit for her most recent birth, by selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Percentage who attended at least one antenatal care visit	Number
Residence		
Urban	99.8	246
Rural	99.2	921
Region		
Hhohho	99.4	313
Lubombo	99.3	258
Manzini	99.5	385
Shiselweni	99.2	211
Marital status		
Never married	99.0	533
Married	99.8	465
Living together	100.0	100
Divorced/separated	(98.0)	48
Widowed	*	17
Type of union		
In polygynous union	(95.9)	26
Not in polygynous union	100.0	489
Not currently in union	98.9	598
Don't know/missing	100.0	54
Education		
No education	(95.7)	25
Primary	99.4	279
Secondary	100.0	404
High school	99.0	358
Tertiary	99.1	98
Wealth quintile		
Lowest	99.6	279
Second	99.4	281
Middle	99.6	276
Fourth	99.6	176
Highest	98.3	154
Age		
15-19	99.1	106
20-24	99.4	348
25-29	99.7	310
30-34	98.8	241
35-39	100.0	116
40-44	(100.0)	41
45-49	*	5
Total 15-24	99.4	454
Total 15-29	99.5	764
Total 15-49	99.4	1,167

The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable. Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution. Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed.

12.4 Breastfeeding

Among mothers aged 15-49 years who gave birth within the prior three years, current breastfeeding was higher in mothers testing HIV negative in the survey (36.4%) compared to mothers testing HIV positive (28.5%). Having never breastfed was higher in mothers testing HIV positive (11.5%) than in mothers testing HIV negative (4.3%; Table 12.4.A).

Table 12.4.A 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 preceding the survey by breastfeeding status, by child's age and mother's HIV status, SHIMS2 2016-2017

Characteristic	Never breastfed	Ever breastfed, but not currently breastfeeding	Currently breastfeeding	Total	Number
Child's age (months)					
0-1	3.1	29.0	67.9	100.0	71
2-3	7.9	26.0	66.1	100.0	90
4-5	8.0	27.4	64.6	100.0	65
6-8	6.9	28.0	65.1	100.0	102
9-11	9.5	29.8	60.7	100.0	115
12-17	4.3	57.8	38.0	100.0	186
18-23	8.5	81.1	10.4	100.0	191
24-36	6.7	92.5	0.8	100.0	323
Result of mother's PHIA survey HIV test					
HIV positive	11.5	60.0	28.5	100.0	416
HIV negative	4.3	59.2	36.4	100.0	682
Not tested	(5.3)	(72.1)	(22.6)	100.0	49
Total	6.9	60.1	33.0	100.0	1,147

The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.
Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.

12.5 Awareness of Mother's HIV Status

Among mothers aged 15-49 years who gave birth during the 12 months prior to the survey, 98.4% reported knowing their HIV status before delivery: 30.2% were diagnosed as HIV positive before ANC, 6.4% were newly diagnosed as HIV positive in ANC, and 61.8% tested HIV negative in ANC (Table 12.5.A).

Among mothers aged 15-49 years who gave birth during the 12 months prior to the survey, prior HIV diagnosis was higher in urban areas (33.8%) than in rural areas (28.9%) and was highest in Lubombo region (36.5%). Prior HIV diagnosis among mothers aged 15-49 years who gave birth in the prior 12 months was lowest in ages 15-19 years (9.6%) and increased with age to a peak of 55.4% in ages 35-39 years. Among mothers aged 15-49 years who gave birth during the prior 12 months, receiving a new HIV diagnosis in ANC was highest in those aged 30-34 years (16.0%; Table 12.5.A).

Among mothers aged 15-24 years who gave birth during the 12 months prior to the survey, 97.5% reported knowing their HIV status before delivery: 16.9% were diagnosed as HIV positive before ANC, 4.0% were newly diagnosed as HIV positive in ANC, and 76.5% were diagnosed as HIV negative in ANC. Prior HIV diagnosis among mothers aged 15-49 years who gave birth in the previous 12 months was over twice as high in ages 20-24 years (19.4%) than in ages 15-19 years (9.6%). New HIV diagnosis among mothers aged 15-49 years, who gave birth in the prior 12 months, was relatively comparable in ages 15-19 years (4.9%) and in ages 20-24 years (3.7%; Table 12.5.A).

Table 12.5.A Prevention of mother-to-child transmission, known HIV status

Among women aged 15-49 years who gave birth within the past 12 months, percentage who were tested for HIV during antenatal care and received their results or who already knew they were HIV positive, by selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Tested for HIV and received result[1]				Number of women who delivered within the past 12 months
	Percentage who tested HIV positive	Percentage who tested HIV negative	Percentage who already knew they were HIV positive	Total percentage with known HIV status[1]	
Residence					
Urban	7.2	56.9	33.8	98.0	94
Rural	6.2	63.5	28.9	98.6	354
Region					
Hhohho	7.0	66.0	26.2	99.3	112
Lubombo	9.0	51.7	36.5	97.2	108
Manzini	4.9	60.0	33.0	97.9	141
Shiselweni	5.5	72.3	22.2	100.0	87
Marital status					
Never married	4.6	72.5	20.1	97.2	222
Married	8.1	49.6	41.8	99.5	155
Living together	(6.5)	(59.8)	(33.7)	(100.0)	48
Divorced/separated	*	*	*	*	16
Widowed	*	*	*	*	5
Type of union					
In polygynous union	*	*	*	*	9
Not in polygynous union	7.1	54.2	38.7	100.0	176
Not currently in union	5.5	69.5	22.5	97.5	243
Don't know/missing	*	*	*	*	20
Education					
No education	*	*	*	*	9
Primary	8.8	50.7	39.7	99.2	114
Secondary	5.1	58.1	36.8	100.0	165
High school	5.8	74.8	14.8	95.4	130
Tertiary	(7.3)	(74.0)	(18.7)	(100.0)	28
Wealth quintile					
Lowest	5.9	62.3	31.9	100.0	115
Second	8.5	61.3	29.4	99.2	119
Middle	6.2	65.8	23.6	95.6	101
Fourth	7.4	51.8	38.6	97.8	67
Highest	(2.3)	(70.5)	(27.3)	(100.0)	45
Age					
15-19	4.9	85.5	9.6	100.0	56
20-24	3.7	73.5	19.4	96.6	148
25-29	4.1	58.7	36.2	99.1	117
30-34	16.0	42.0	41.0	99.0	78
35-39	(3.2)	(41.4)	(55.4)	(100.0)	36
40-44	*	*	*	*	13
45-49	*	*	*	*	0
15-29	4.1	69.9	24.1	98.1	321
25-49	8.4	49.8	41.0	99.2	244
Total 15-24	4.0	76.5	16.9	97.5	204
Total 15-49	6.4	61.8	30.2	98.4	448

[1]Relates to PEPFAR indicator PMTCT_STAT_NAT.

Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.

Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed.

The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

12.6 Antiretroviral Therapy Among HIV-Positive Pregnant Women

Among HIV-positive mothers aged 15-49 years who gave birth during the 12 months prior to the survey, over half (56.1%) were on ARVs prior to pregnancy, and more than a third (34.0%) were newly initiated onto ARVs during pregnancy, labor, or delivery (Table 12.6.A).

Among HIV-positive mothers aged 15-24 years who gave birth during the 12 months prior to the survey, 48.0% were on ARVs prior to pregnancy and 40.3% were newly initiated onto ARVs during pregnancy, labor, or delivery (Table 12.6.A).

Table 12.6.A Prevention of mother-to-child transmission, HIV-positive pregnant women who received antiretrovirals (ARVs)

Among self-reported HIV-positive women aged 15-49 years who gave birth within the past 12 months, percentage who received ARVs during pregnancy to reduce the risk of mother-to-child-transmission, by selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Percentage who were already on ARVs prior to pregnancy	Percentage who were newly initiated on ARVs during pregnancy or labor and delivery	Total percentage who received ARVs[1]	Number of HIV-positive women who gave birth within the past 12 months
Residence				
Urban	(59.2)	(29.1)	(88.3)	36
Rural	54.8	36.0	90.7	125
Region				
Hhohho	(62.4)	(32.4)	(94.9)	35
Lubombo	(53.7)	(35.6)	(89.3)	48
Manzini	50.9	34.7	85.6	53
Shiselweni	(64.6)	(31.0)	(95.6)	25
Marital status				
Never married	49.3	37.7	87.0	54
Married	56.7	35.1	91.8	76
Living together	*	*	*	18
Divorced/separated	*	*	*	10
Widowed	*	*	*	3
Type of union				
In polygynous union	*	*	*	6
Not in polygynous union	63.1	29.5	92.5	79
Not currently in union	47.9	40.0	88.0	67
Don't know/missing	*	*	*	9
Education				
No education	*	*	*	6
Primary	51.8	39.6	91.4	52
Secondary	63.1	28.0	91.1	67
High school	(39.7)	(40.2)	(79.9)	28
Tertiary	*	*	*	7
Wealth quintile				
Lowest	(51.6)	(36.7)	(88.3)	43
Second	(58.3)	(35.7)	(94.0)	44
Middle	(55.6)	(41.2)	(96.8)	30
Fourth	(54.9)	(27.7)	(82.5)	29
Highest	*	*	*	14
Age				
15-19	*	*	*	8
20-24	(55.1)	(35.4)	(90.4)	36
25-29	(55.1)	(31.2)	(86.3)	44
30-34	(55.5)	(40.3)	(95.7)	45
35-39	*	*	*	21
40-44	*	*	*	7
45-49	*	*	*	0
15-29	51.7	35.6	87.2	88
25-49	58.9	31.7	90.7	117
Total 15-24	(48.0)	(40.3)	(88.3)	44
Total 15-49	56.1	34.0	90.0	161

[1]Relates to Global AIDS Monitoring indicator 2.3: Preventing the mother-to- child transmission of HIV and PEPFAR indicator PMTCT_ARV_NAT.
Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.
Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed.
The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

12.7 Mother-to-Child Transmission

Among infants under the age of 18 months born to HIV-positive mothers aged 15-49 years, 12.8% were confirmed HIV positive by virologic testing. Among infants between the ages of 0-11 months, 14.7% were confirmed HIV positive by virologic testing (Table 12.7.A). (Note: Virological testing was conducted only among those infants with a reactive rapid test at screening during the survey.)

Among HIV-positive mothers aged 15-49 years with infants under 18 months of age, 14.5% reported ever breastfeeding their infant and 2.4% reported ARV use at the first ANC visit (Table 12.7.A).

Table 12.7.A Mother-to-child transmission of HIV

Among infants born in the last 17 months to HIV-positive women aged 15-49 years, percentage confirmed positive for HIV infection, by mother's self-reported antiretroviral therapy (ART) and breastfeeding status, SHIMS2 2016-2017

Characteristic	Percentage of infants confirmed HIV positive[1,2]	Number of infants born to HIV-positive women[3,4]
Mother's self-reported ARV status		
Mother unaware of HIV status during pregnancy	*	7
Already on ARVs at first antenatal visit	(2.4)	36
Newly initiated on ARVs during pregnancy or labor and delivery	*	20
Did not receive ARVs during pregnancy	*	4
Missing self-reported ARV status	*	22
Mother's self-reported breastfeeding status		
Ever breastfed the infant	14.5	60
Never breastfed the infant	*	7
Missing self-reported breastfeeding status	*	22
Total 0-11 months	14.7	62
Total 0-17 months	12.8	89

[1]Relates to Global AIDS Monitoring indicator 2.2: Mother-to-child transmission of HIV.
[2]Infants confirmed as HIV positive by virological testing (virological testing was only conducted among infants who had a reactive screening test).
[3]Includes only infants who were tested for HIV during the PHIA survey.
[4]Women who tested HIV positive during the PHIA survey.
Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.
Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed.
The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

12.8 Gaps and Unmet Needs

- Exclusive breastfeeding in infants aged 0-6 months is standard of care, regardless of the mother's HIV status. Yet, over a tenth of HIV-positive mothers never breastfed their infants. Interventions encouraging age-appropriate exclusive breastfeeding and complementary feeding regardless of the mother's HIV status are essential to promote infant health, particularly when combined with effective ART in HIV-positive mothers.
- One in ten previously diagnosed HIV-positive mothers self-reported as no ARV use during pregnancy, labor, or delivery. Closing this gap in treatment delivery is key to assure reduced MTCT and morbidity and mortality among HIV-positive mothers.
- A proportion of infants aged 0-17 months were diagnosed with HIV by virologic testing. Yet effective ART provision to HIV-positive mothers can virtually eliminate HIV MTCT. Better strategies are critical to assure provision of preventive ARV regimens to all HIV-exposed infants, including ART to pregnant and breastfeeding HIV-positive mothers.

12.9 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, 283:1175–1182. doi:10.1001/jama.283.9.1175.

2. World Health Organization. *Towards the elimination of mother-to-child transmission of HIV: Report of a WHO technical consultation.* Geneva: World Health Organization; 2011. http://apps.who.int/iris/bitstream/handle/10665/44638/9789241501910_eng.pdf;jsessionid=CD35DAE3C3D00349A9B149BCFF9262C4?sequence=1. Accessed December 17, 2018.

13 YOUNG PEOPLE

13.1 Key Findings

- Among young people aged 15-24 years, 3.5% had sex before the age of 15 years (4.5% males, 2.5% females).
- Using an ARV-adjusted LAg avidity testing algorithm, estimated annual incidence was 1.07% (95% confidence interval (CI): 0.46%-1.69%) among young people aged 15-24 years: 0.52% (95% CI: 0.00%-1.14%) males, 1.67% (95% CI: 0.62%-2.71%) females.
- HIV prevalence in young people aged 15-24 years was higher in ages 20-24 years (4.2% males, 20.9% females) than in ages 15-19 years (3.9% males, 7.2% females).
- Testing in the prior 12 months was significantly higher in ages 15-19 years in females than in males (47.9% and 33.0%, respectively) and significantly higher in ages 20-24 years in females than in males (74.2% and 51.1%, respectively).
- Among HIV-positive young people aged 15-24 years, about one-third (33.9%) were unaware of their HIV-positive status (48.5% males, 29.8% females).
- Among young people aged 15-24 years who are living with HIV, over half (54.1%) were aware of their HIV-positive status and on ART (46.8% males, 56.1% females).
- Among HIV-positive young people aged 15-24 years, half (50.6%) had suppressed viral loads (32.9% males, 55.5% females).
- Based on self-reported prior HIV diagnosis, self-reported ART use, and ARV biomarker detection in HIV-positive young people aged 15-24 years, 72.1% were classified as ARV-adjusted diagnosed; among them, 85.3% were classified as ARV-adjusted on treatment, of which 76.5% had VLS.

13.2 Background

One-third of the population of sub-Saharan Africa is between the ages of 10-24 years, a phenomenon often referred to as the "youth bulge."[1] Young people (defined as older adolescents aged 15-19 years and young adults aged 20-24 years) are more likely to engage in risky sexual behaviors than older adults and have less frequent contact with the healthcare system. Control of HIV in this demographic is critical for long-term epidemic control but is also particularly challenging. This chapter presents the prevalence of early sexual debut before the age of 15 years among young people, and also describes HIV incidence, prevalence, and the 90-90-90 targets for this age group.

13.3 Sexual Intercourse Before the Age of 15 Years

Among young people aged 15-24 years, 3.5% had sex before the age of 15 years (4.5% in males and 2.5% in females). Early sexual debut among young people was higher in urban areas (4.9%) than in rural areas (3.1%) and was highest in Manzini region (4.2%). Sexual debut before the age of 15 years was lowest in those never married (3.1%). Early sexual debut was most common in the highest wealth quintile (4.6%) and progressively decreased to the lowest wealth quintile (2.2%) (Table 13.3.A).

Among young people, early sexual debut was higher in ages 20-24 years (5.9% in males and 3.6% in females) than in ages 15-19 years (3.2% in males and 1.6% in females). Early sexual debut among young females was highest in those who attended primary education (4.3%) and lowest in those who attended tertiary (0%). In contrast, early sexual debut among young males was lowest in those who attended

primary education (3.9%) and increased to those who attended tertiary (10.8%). Early sexual debut was lowest among females who had never married (1.9%), but in contrast was highest among males who had never married (4.3%) (Table 13.3.A).

Table 13.3.A Sexual intercourse before 15 years of age

Percentage of young people aged 15–24 years who had sexual intercourse before 15 years of age; by sex and selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Males		Females		Total	
	Percentage who had sex before 15 years of age	Number	Percentage who had sex before 15 years of age	Number	Percentage who had sex before 15 years of age	Number
Residence						
Urban	6.9	285	3.4	391	4.9	676
Rural	3.8	1,460	2.3	1,585	3.1	3,045
Region						
Hhohho	4.5	524	2.1	584	3.3	1,108
Lubombo	2.2	354	3.0	398	2.6	752
Manzini	5.5	507	3.1	629	4.2	1,136
Shiselweni	4.9	360	1.6	365	3.3	725
Marital status						
Never married	4.3	1,694	1.9	1,716	3.1	3,410
Married	*	15	6.8	149	6.5	164
Living together	*	12	5.1	70	7.8	82
Divorced/separated	*	12	(8.5)	29	(7.8)	41
Widowed	*	0	*	1	*	1
Type of union						
In polygynous union	*	0	*	14	*	14
Not in polygynous union	(11.7)	27	5.4	181	6.4	208
Not currently in union	4.3	1,706	2.0	1,746	3.2	3,452
Don't know/missing	*	12	(12.3)	35	(10.7)	47
Education						
No education	*	12	*	13	(10.7)	25
Primary	3.9	486	4.3	399	4.1	885
Secondary	4.1	627	2.6	822	3.3	1,449
High school	4.4	550	1.4	639	2.9	1,189
Tertiary	10.8	70	0.0	103	4.9	173
Wealth quintile						
Lowest	2.7	435	1.8	510	2.2	945
Second	5.3	410	1.5	436	3.4	846
Middle	4.6	441	2.9	467	3.8	908
Fourth	5.6	235	2.7	287	4.0	522
Highest	4.8	223	4.4	275	4.6	498
Age						
15-19	3.2	1,060	1.6	1,055	2.4	2,115
20-24	5.9	685	3.6	921	4.7	1,606
Total 15-24	4.5	1,745	2.5	1,976	3.5	3,721

Estimate in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.
Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed.
The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

13.4 HIV Incidence and Prevalence

HIV incidence estimates using LAg avidity and HIV viral load

Using the VL-adjusted LAg avidity testing algorithm, estimated incidence was 1.31% (95% CI: 0.66%-1.96%) among young people: 0.79% (95% CI: 0.07%-1.50%) in males and 1.87% (95% CI: 0.76%-2.98%) in females. Interpretation of estimates is limited since SHIMS2 was designed to estimate incidence in ages 15-49 years (Table 5.3.A).

HIV incidence estimates using LAg avidity, HIV viral load, and ARV detection

Using the ARV-adjusted LAg avidity testing algorithm, estimated incidence was 1.07% (95% CI: 0.46%-1.69%) among young people: 0.52% (95% CI: 0.00%-1.14%) in males and 1.67% (95% CI: 0.62%-2.71%) in females. Interpretation of estimates is limited since SHIMS2 was designed to estimate incidence in ages 15-49 years (Table 5.3.B).

HIV prevalence

Nearly one-tenth (9.1%) of young people was HIV positive. HIV prevalence in females was more than triple the HIV prevalence in males (13.9% and 4.1%, respectively). HIV prevalence was higher in ages 20-24 years (4.2% in males and 20.9% females) than in ages 15-19 years (3.9% in males and 7.2% in females; Table 6.4.A).

13.5 HIV Testing, Treatment, and Viral Load Suppression

HIV testing among young people

Among young people, three-quarters (75.4%) had ever tested for HIV and received their test results (i.e., lifetime testing). Lifetime testing was lower in ages 15-19 years (65.2%) than in ages 20-24 years (86.1%). Half (51.6%) had received HIV testing and their test results in the 12 months prior to the survey. Testing in the prior 12 months was lower in ages 15-19 years (40.6%) than in ages 20-24 years (63.1%) (Table 7.3.C).

Among young people, lifetime testing and testing in the prior 12 months were higher in females (81.0% and 61.0%, respectively) than in males (69.5% and 41.8%, respectively). Lifetime testing was lower in ages 15-19 years (61.9% in males and 68.3% females) than in ages 20-24 years (77.7% in males and 93.9% in females). Similarly, testing in the prior 12 months was lower in ages 15-19 years (33.0% in males and 47.9% in females) than in ages 20-24 years (51.1% in males and 74.2% in females). Testing in the prior 12 months was significantly higher in ages 15-19 years in females (47.9%) than males (33.0%) and significantly higher in ages 20-24 years in females (74.2%) than males (51.1%) (Tables 7.3.A and 7.3.B, Figure 7.3.A).

Self-reported diagnosis and treatment status among HIV-positive young people

Among young people living with HIV, one-third (33.9%) were unaware of their HIV status: 48.5% in males and 29.8% in females. Being unaware of their HIV-positive status was higher in females ages 15-19 years (35.9%) than those aged 20-24 years (27.6%). In contrast, being unaware of their HIV-positive status was less common in males aged 15-19 years (35.0%) than in those aged 20-24 years (61.5%; Tables 8.3.A, 8.3.B, and 8.3.C).

Over half (54.1%) of young people living with HIV were aware of their HIV status and on ART: 46.8% in males and 56.1% in females. Awareness of one's HIV-positive status and ART use was lower in females aged 15-19 years (52.6%) than in those aged 20-24 years (57.3%). In contrast, awareness of one's HIV-

positive status and ART use was higher in males aged 15-19 years (59.5%) than in those aged 20-24 years (34.6%; Tables 8.3.A, 8.3.B, and 8.3.C).

Half (50.6%) of young people living with HIV had a suppressed viral load: 32.9% in males and 55.5% in females. Viral suppression was comparable between females aged 15-19 years (55.0%) and those aged 20-24 years (55.7%). In contrast, viral suppression was higher in males aged 15-19 years (40.2%) than in those aged 20-24 years (25.8%; Table 9.4.A).

13.6 Status of the 90-90-90 Targets

90-90-90 targets per self-reported HIV diagnosis and self-reported ART use

In HIV-positive young people, 66.1% reported as diagnosed. Among them, 81.7% reported current treatment. In those reporting current treatment, 76.4% had VLS. (Table 10.3.A).

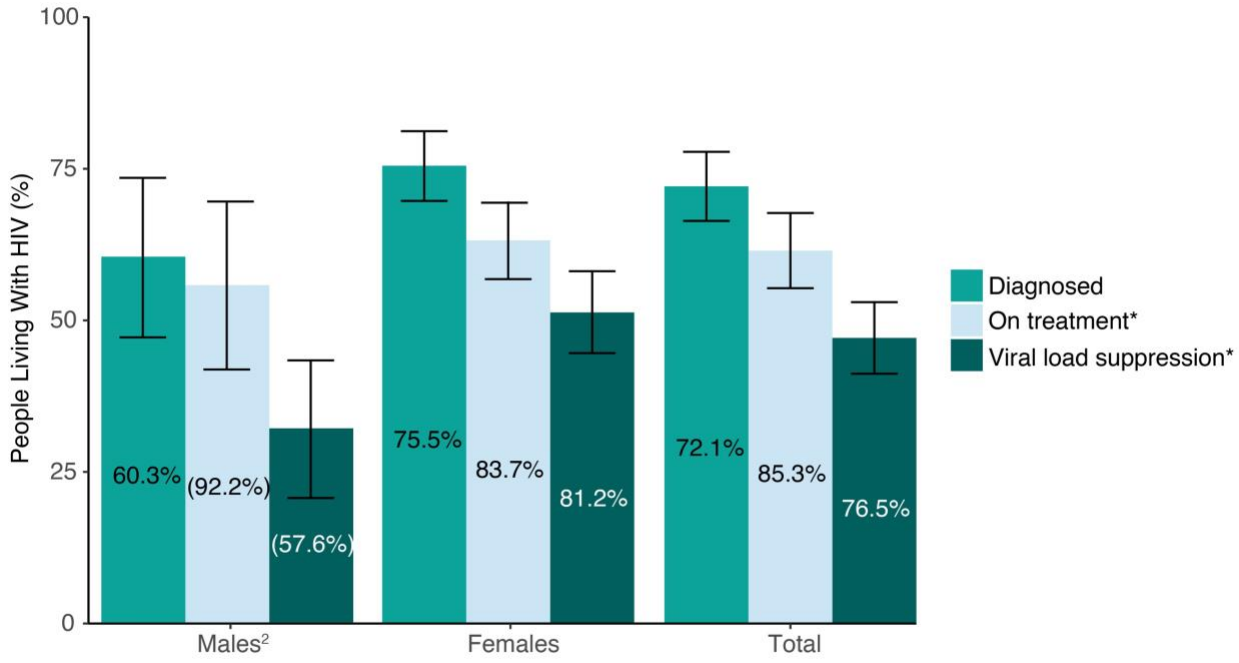
In HIV-positive young females, 70.2% reported as diagnosed; among them, 79.9% reported current treatment, of whom 79.9% had suppressed viral loads. In HIV-positive young males, 51.5% reported as diagnosed; among them, 90.9% reported current treatment, 61.3% of whom had suppressed viral loads (Table 10.3.A).

90-90-90 targets per self-reported HIV diagnosis, self-reported ART use, and ARV biomarker data

In HIV-positive young people, 72.1% were classified as ARV-adjusted diagnosed. Among those who were ARV-adjusted diagnosed, 85.3% were classed as ARV-adjusted on treatment. In young people classified as ARV-adjusted on treatment, 76.5% had suppressed viral loads (Table 10.3.B, Figure 13.6.A).

In HIV-positive young females, 75.5% were classified as ARV-adjusted diagnosed. Among them, 83.7% were classed as ARV-adjusted on treatment and of these, 81.2% had suppressed viral loads. In HIV-positive young males, 60.3% were classified as ARV-adjusted diagnosed. Among them, 92.2% were classed as ARV-adjusted on treatment and of these, 57.6% had suppressed viral loads (Table 10.3.B; Figure 13.6.A)

Figure 13.6.A Young people, aged 15-24 years, 90-90-90 antiretroviral-adjusted data,[1] SHIMS2 2016-2017



[1]In the antiretroviral (ARV)-adjusted 90-90-90, participants are classified as 'Aware' or 'Diagnosed' if they reported knowing their HIV-positive status before testing HIV positive in SHIMS2 and/or had detectable ARVs in their blood. Participants are classified as 'On Treatment' if they reported that they were on treatment and/or if they had detectable ARVs in their blood.
[2]Estimates in parentheses are based on a small number (25-49) of unweighted cases and should be interpreted with caution.
*Inset numbers are conditional proportions.

13.7 Gaps and Unmet Needs

- Well over a third of HIV-positive young people were not diagnosed. Among those previously diagnosed with HIV, nearly a sixth were not on ART. Among those on ART, nearly a quarter did not have suppressed viral loads. Tailored targeting of programs towards the specific needs of older adolescents and young adults may enhance the effectiveness of HIV services.
- Only half of young people living with HIV had viral load suppression—underscoring the need for strategic targeting and strong treatment adherence support.

13.8 References

1. Hervish A, Clifton D. *The Status Report on Adolescents and Young People in Sub-Saharan Africa: Opportunities and Challenges*. Johannesburg and Washington, DC: Population Reference Bureau; 2012.

14 CHILDREN

14.1 Key Findings

- HIV prevalence among children aged 0-14 years was 2.8% and peaked in ages 10-14 years at 4.1%.
- Based on parent/guardian-report and presence of detectable ARVs in blood samples, 77.5% of HIV-positive children aged 0-14 years had a known HIV-positive status.
- Based on parent/guardian-report and presence of detectable ARVs in blood samples, 100.0% of HIV-positive children aged 0-14 years were on ART.
- Based on parent/guardian-report and presence of detectable ARVs in blood samples, 73.9% of HIV-positive children aged 0-14 years had VLS.

14.2 Background

Estimates of HIV prevalence, number living with HIV, and viral suppression among children are commonly derived indirectly from clinic-based data or epidemiologic models. SHIMS2 provides direct measurements of these estimates among children (defined in this survey as those aged 0-14 years, unless otherwise noted), which are critical for meeting the needs of planning for HIV prevention, care, and treatment services for children, evaluating PMTCT programs, and addressing specific needs of children.

This chapter presents results on the 90-90-90 targets in children, using parent/guardian-reported data (i.e., prior diagnosis of child's HIV status and ART use) and data on detectable ARVs in the blood. Analyses are presented similarly to Chapter 10 UNAIDS 90-90-90 targets on adults aged 15 years and older. For this chapter, parents or guardians were asked about a child's HIV status and ART use. Data on detectable ARVs were used in combination with parent/guardian-reported ART use to define the ART status of a child. Presence of detectable ARVs in children with parent/guardian-reported undiagnosed HIV-positive status were reclassified as diagnosed. Children with viral suppression, but whose parents reported them as undiagnosed or not on ART, were excluded from the numerator of the 90% target on VLS.

14.3 HIV Prevalence

Among children, HIV prevalence was 2.8%. The prevalence of HIV in children increases across five-year age groups: 1.7% in ages 0-4 years, 2.9% in ages 5-9 years, and 4.1% in ages 10-14 years (Table 6.4.A).

HIV prevalence in children is higher in males (3.0%) than in females (2.6%). Among ages 0-4 years, HIV prevalence is higher in females (1.8%) than in males (1.6%). However, HIV prevalence is higher in males (3.1%) compared with females (2.7%) in ages 5-9 years and in ages 10-14 years, 4.7% and 3.4% among males and females, respectively (Table 6.4.A).

14.4 Status of the 90-90-90 Targets

90-90-90 targets per parent/guardian-reported HIV diagnosis and parent/guardian-reported ART use

Among children living with HIV, 71.2% were parent/guardian-reported as diagnosed. Among children whose parent/guardian-reported them as diagnosed with HIV, 100.0% were reported being on treatment. Among those reported as on treatment, 74.0% had suppressed viral loads (Table 14.4.A).

90-90-90 targets per parent/guardian-reported HIV diagnosis, parent/guardian-reported ART use, and ARV biomarker data

Among children living with HIV, 77.5% were parent/guardian-reported as diagnosed or had detectable ARVs in their blood (i.e., ARV-adjusted diagnosed). Among children classified as ARV-adjusted diagnosed, 100.0% were reported on treatment or had detectable ARVs in their blood (i.e., ARV-adjusted on treatment). In HIV-positive children classified as ARV-adjusted on treatment, 73.9% had suppressed viral loads (Table 14.4.B, Figure 14.4.A).

Table 14.4.A Pediatric 90-90-90 (parent-reported antiretroviral therapy [ART] data, conditional percentages)

90-90-90 targets among children living with HIV aged 0-14 years, by age SHIMS2 2016-2017

	Diagnosed		On Treatment		Viral Load Suppression (VLS)	
	Total		Among children whose parent reported that the child is HIV positive		Among children whose parent reported that the child is on ART	
Age	Percentage whose parent reported that the child is HIV positive	Number	Percentage whose parent reported that the child is on ART	Number	Percentage with VLS	Number
0-17 months	*	10	*	3	*	3
18-59 months	*	5	*	4	*	4
0-4 years	*	15	*	7	*	7
5-9 years	(81.0)	31	(100.0)	26	(75.2)	26
10-14 years	(78.0)	41	(100.0)	33	(77.7)	33
0-14 years	71.2	87	100.0	66	74.0	66

Estimate in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.

Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed.

Table 14.4.B Pediatric 90-90-90 (parent-reported antiretroviral therapy [ART] data and laboratory antiretroviral [ARV] data; conditional percentages)

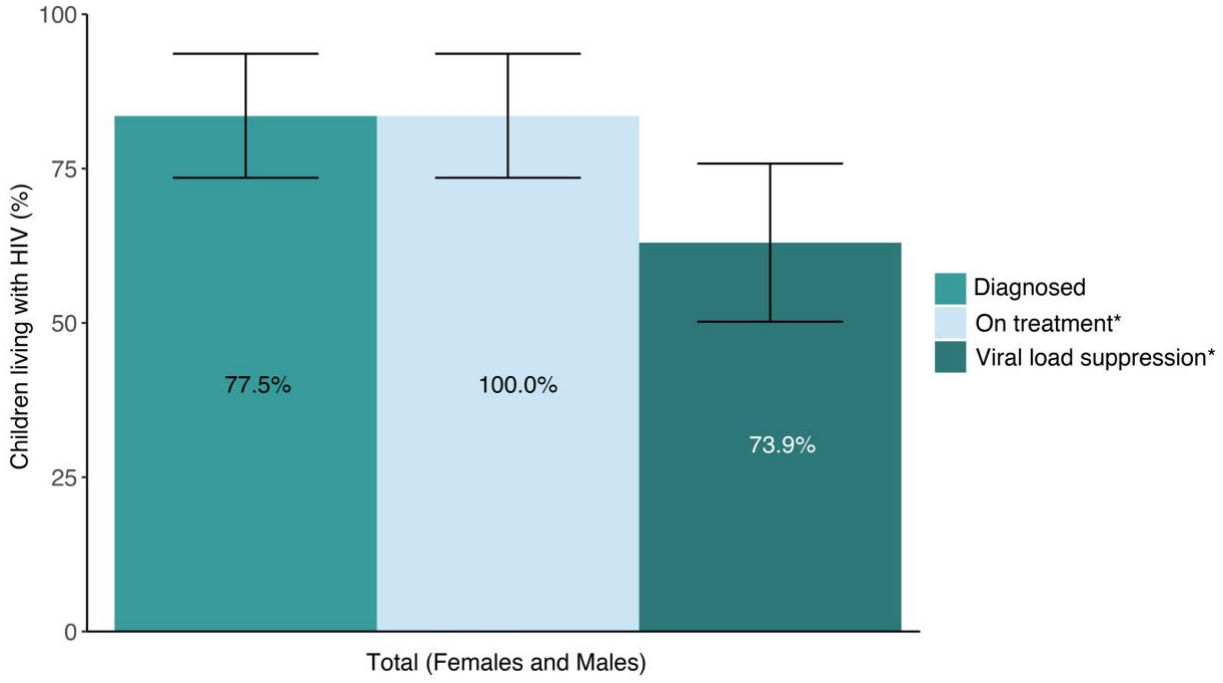
90-90-90 targets among children living with HIV aged 0-14 years, by age SHIMS2 2016-2017

	Diagnosed		On Treatment		Viral Load Suppression (VLS)	
	Total		Among children whose parent reported that the child is HIV positive AND/OR with detectable ARVs		Among children whose parent reported the child was on ART AND/OR with detectable ARVs	
Age	Percentage whose parent reported that the child is HIV positive AND/OR with detectable ARVs	Number	Percentage whose parent reported the child was on ART AND/OR with detectable ARVs	Number	Percentage with VLS	Number
0-17 months	*	10	*	3	*	3
18-59 months	*	6	*	6	*	6
0-4 years	*	16	*	9	*	9
5-9 years	(86.3)	33	(100.0)	29	(75.1)	29
10-14 years	(84.0)	43	(100.0)	37	(75.3)	37
0-14 years	77.5	92	100.0	75	73.9	75

Estimate in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.

Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed.

Figure 14.4.A Children, aged 0-14 years, 90-90-90, laboratory antiretroviral-adjusted data,[1] SHIMS2 2016-2017



[1]In the antiretroviral (ARV)-adjusted 90-90-90, participants are classified as 'Aware' or 'Diagnosed' if they reported being aware of their HIV-positive status before testing HIV positive in SHIMS2 and/or had detectable ARVs in their blood. Participants are classified as 'On Treatment' if they reported that they were on treatment and/or if they had detectable ARVs in their blood.

*Inset numbers are conditional proportions.

14.5 Gaps and Unmet Needs

- At least one in five HIV-positive children had not been diagnosed with HIV. Identification of these children is necessary to assure lower morbidity and mortality in this age group.
- More than one in four HIV-positive children on treatment had uncontrolled HIV VL. It is critical to ensure children are on the optimal regimen for their age and weight and that they (or their caregivers) receive tailored adherence support.
- With 4.1% of children aged 10-14 years living with HIV, programs to support HIV knowledge, including safer sex practices, and HIV treatment to prevent transmission, are key for these early adolescents approaching sexual debut.

15 HIV Risk Behaviors

15.1 Key Findings

- Among adults aged 15 years and older who had sexual debut before the age of 15 years, less than a fifth (18.7%) of males were HIV positive, compared to about half (50.6%) of females.
- Among adults aged 15 years and older with two or more sexual partners in the prior 12 months, HIV prevalence was nearly double in females (45.3%) than in males (22.8%).
- Among adults aged 15 years and older who did not use a condom at last sexual intercourse in the prior 12 months, about a fifth (20.9%) were HIV positive (16.8% males, 24.1% females).
- Among adults aged 15 years and older who were living with their sexual partner and who had sex with a non-marital, non-cohabitating partner in the prior 12 months, more than half (54.5%) used a condom at last sexual intercourse. Condom use at last sexual intercourse with a non-marital, non-cohabitating partner was comparatively higher in married adults (63.7%).
- Among adult males aged 15 years and older, 70.7% reported as uncircumcised and 26.7% had received medical male circumcision. One-third (34.8%) of adult males aged 15-24 years self-reported as medically circumcised.

15.2 Background

This chapter describes the prevalence of sexual behaviors that elevate risk of HIV infection. SHIMS2 asked questions about high-risk behaviors, including early sexual debut (sexual intercourse before the age of 15), recent engagement in multiple sexual partnerships, condom use at last sexual intercourse, recent engagement in paid sexual intercourse, and condom use at last sexual intercourse with a non-marital, non-cohabitating partner. With this information, programs can target those individuals most in need of information and most at risk for HIV infection.

The MOH of Eswatini recommends voluntary medical male circumcision (VMMC) as a cost-effective strategy to reduce female-to-male sexual transmission of HIV. To inform VMMC programs, men aged 15 years and older were asked if they had been medically or traditionally circumcised.

15.3 HIV Prevalence by Sexual Behavior

Among adults (defined in this survey as those aged 15 years and older), HIV prevalence was higher in those with early sexual debut (37.2%) compared to those with sexual debut at ages 25 years and older (23.7%). Among those who reported early sexual debut, 18.7% of males and 50.6% of females were HIV-positive. Among adults with two or more sexual partners in the past 12 months, 28.7% were HIV-positive. HIV prevalence was nearly twice as high in females than in males among adults with two or more sexual partners in the prior 12 months (45.3% and 22.8%, respectively; Table 15.3.A).

A fifth (20.9%) of adults who did not use a condom at last sexual intercourse in the prior 12 months were HIV positive (16.8% of males and 24.1% of females). However, two-fifths (40.0%) of adults who used a condom at last sexual intercourse in the prior 12 months were HIV positive (30.6% of males and 48.4% of females). Nearly a third (32.4%) of adults who abstained from sexual intercourse in the prior 12 months were HIV positive (22.6% in males and 36.1% in females; Table 15.3.A).

HIV prevalence was comparable between adults who did and did not report paid sexual intercourse in the 12 months prior to the survey (29.7% and 31.5%, respectively) (Table 15.3.A).

Table 15.3.A HIV prevalence by sexual behavior

Prevalence of HIV among adults aged 15 years and older, by sex and sexual behavior characteristics, SHIMS2 2016-2017

Characteristic	Males		Females		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
Age at first sexual intercourse						
<15	18.7	158	50.6	284	37.2	442
15-19	23.3	1,624	38.5	3,482	32.9	5,106
20-24	27.0	1,063	32.3	1,310	29.7	2,373
≥25	23.3	377	24.5	235	23.7	612
Number of sexual partners in the past 12 months						
0	22.6	368	36.1	1,355	32.4	1,723
1	25.5	2,316	36.7	3,848	32.1	6,164
≥2	22.8	651	45.3	263	28.7	914
Condom use at last sexual intercourse in the past 12 months						
Used condom	30.6	1,687	48.4	2,143	40.0	3,830
Did not use condom	16.8	1,209	24.1	1,889	20.9	3,098
No sexual intercourse in the past 12 months	22.6	368	36.1	1,355	32.4	1,723
Paid sexual intercourse in the past 12 months						
Yes[1]	(27.6)	28	*	5	(29.7)	33
Used condom at last paid sexual intercourse	*	24	*	4	(28.7)	28
Did not use condom at last paid sexual intercourse	*	4	*	1	*	5
No[2]	24.8	2,928	37.1	4,102	31.5	7,030
Total 15-24	4.1	1,675	13.9	1,926	9.1	3,601
Total 15-49	18.9	3,655	34.3	4,878	27.2	8,533
Total 15+	20.4	4,506	32.5	6,428	27.0	10,934

[1]Includes persons who paid or received money for sexual intercourse.
[2]No paid sexual intercourse or no sexual intercourse in the past 12 months.
The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.
Estimate in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.
Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed.

15.4 Condom Use at Last Sex with a Non-Marital, Non-Cohabitating Partner

Among adults who were sexually active in the 12 months prior to the survey, 48.3% had sex with a non-marital, non-cohabitating partner (53.6% in males and 43.9% in females). Among sexually active adults, sex with a non-marital, non-cohabitating partner was less than half the percentage in those with no education (27.1%) than in those completing high school (58.2%). A fifth (20.7%) of sexually active adults living with their sexual partner had sex with a non-marital, non-cohabitating partner in the prior 12 months, in contrast to 5.7% of sexually active married adults. Among sexually active adults in polygynous unions, 14.3% had sex with a non-marital, non-cohabitating partner in the prior 12 months. Sex with a non-marital, non-cohabitating partner among sexually active adults in polygynous unions was higher in males (28.6%) than in females (8.0%; Tables 15.4.A, 15.4.B, and 15.4.C).

Among sexually active adults, sex with a non-marital, non-cohabitating partner was higher at ages 15-24 years (83.4%) than at ages 25 years and older (37.4%). This disparity was greater in males (95.0% in ages 15-24 years and 42.1% in ages 25 years and older) than in females (75.1% in ages 15-24 years and 33.1% in ages 25 years and older). The percentage of sexually active adults who had sex with a non-marital,

non-cohabitating partner was highest in ages 15-19 years (92.5%) and next highest in ages 20-24 years (80.4%) and in ages 25-29 years (60.2%). Among sexually active adults aged 30-44 years, the percentage who had sex with a non-marital, non-cohabitating partner ranged from 30.2% to 45.6%. The percentage of sexually active adults aged 45 years and older who had sex with a non-marital, non-cohabitating partner ranged from 8.5% to 18.7% (Tables 15.4.A, 15.4.B, and 15.4.C).

Among adults who had sex with a non-marital, non-cohabitating partner in the 12 months prior to the survey, 69.3% used a condom at last sexual intercourse (73.3% in males and 65.1% in females). In adults who had sex with a non-marital, non-cohabitating partner in the 12 months prior, three-quarters attended tertiary education (74.1%) and three-quarters of the highest wealth quintile (74.7%) used a condom at last sexual intercourse. More than half (54.5%) of adults living with their sexual partner, who had sex with a non-marital, non-cohabitating partner in the prior 12 months, used a condom at last sexual intercourse. Condom use at last sexual intercourse was comparatively higher in married adults who had sex with a non-marital, non-cohabitating partner (63.7%). A condom was used at last sexual intercourse in 60.6% of adults in polygynous unions, who had sex with a non-marital, non-cohabitating partner in the prior 12 months (Tables 15.4.A, 15.4.B, and 15.4.C).

Among adults who had sex with a non-marital, non-cohabitating partner, condom use at last sexual intercourse was 71.4% in ages 15-24 years and 67.7% in ages 25 years and older. The percentage of condom use at last sexual intercourse among adults who had sex with a non-marital, non-cohabitating partner was highest in ages 15-19 years (76.2%) and lowest in ages 65 years and older (52.5%; Table 15.4.C).

Table 15.4.A Condom use at last sex with a non-marital, non-cohabitating partner: Males

Among males aged 15 years and older who reported having sex in the past 12 months, percentage who reported having a non-marital, non-cohabitating partner in the past 12 months; among those who reported having sex with a non-marital, non-cohabitating partner in the past 12 months, percentage who reported using a condom the last time they had sex with a non-marital, non-cohabitating partner, by selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Among males who reported having sex in the past 12 months		Among males who reported having sex with a non-marital, non-cohabiting partner in the past 12 months	
	Percentage who reported having sex with a non-marital, non-cohabitating partner in the past 12 months	Number	Percentage who reported using a condom the last time they had sex with a non-marital, non-cohabitating partner[1]	Number
Residence				
Urban	53.8	858	74.0	442
Rural	53.5	2,420	72.9	1,189
Region				
Hhohho	51.4	1,035	74.7	499
Lubombo	52.8	684	69.1	338
Manzini	55.1	1,025	75.0	529
Shiselweni	55.7	534	71.6	265
Marital status				
Never married	94.8	1,403	75.0	1,294
Married	9.1	1,479	66.1	127
Living together	25.6	222	60.3	55
Divorced/separated	91.6	126	67.6	110
Widowed	(97.1)	35	(71.2)	33
Type of union				
In polygynous union	28.6	101	(63.8)	25
Not in polygynous union	10.5	1,563	63.9	151
Not currently in union	94.6	1,564	74.4	1,437
Don't know/missing	34.5	50	*	18
Education				
No education	27.3	193	(76.8)	47
Primary	43.2	971	68.9	375
Secondary	57.5	757	71.3	412
High school	64.6	957	74.2	597
Tertiary	53.2	395	80.5	199
Wealth quintile				
Lowest	49.8	642	71.7	293
Second	55.8	671	73.1	335
Middle	55.7	763	68.2	394
Fourth	55.1	574	73.6	303
Highest	51.2	628	80.4	306
Age				
15-19	97.5	190	86.7	179
20-24	94.2	457	76.1	420
25-29	75.3	545	74.0	407
30-34	55.8	481	66.6	264
35-39	36.3	392	65.7	143
40-44	28.3	297	65.6	83
45-49	16.9	216	(82.1)	33
50-54	19.4	177	(74.4)	34
55-59	19.1	157	(53.2)	27
60-64	14.0	149	*	20
65+	9.5	217	*	21
15-29	85.9	1,192	76.7	1,006
20-39	68.5	1,875	72.5	1,234
25+	42.1	2,631	69.9	1,032
Total 15-24	95.0	647	78.6	599
Total 15-49	61.8	2,578	73.7	1,529
Total 15+	53.6	3,278	73.3	1,631

[1]Relates to Global AIDS Monitoring indicator 3.18: Condom use at last high-risk sex.

Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.

Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed.

The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

Table 15.4.B Condom use at last sex with a non-marital, non-cohabitating partner: Females

Among females aged 15 years and older who reported having sex in the past 12 months, percentage who reported having a non-marital, non-cohabitating partner in the past 12 months; among those who reported having sex with a non-marital, non-cohabitating partner in the past 12 months, percentage who reported using a condom the last time they had sex with a non-marital, non-cohabitating partner, by selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Among females who reported having sex in the past 12 months		Among females who reported having sex with a non-marital, non-cohabitating partner in the past 12 months	
	Percentage who reported having sex with a non-marital, non-cohabitating partner in the past 12 months	Number	Percentage who reported using a condom the last time they had sex with a non-marital, non-cohabitating partner[1]	Number
Residence				
Urban	51.5	985	67.0	496
Rural	40.8	3,358	64.1	1,292
Region				
Hhohho	42.4	1,303	66.8	521
Lubombo	43.0	862	59.5	353
Manzini	45.3	1,379	66.9	591
Shiselweni	44.3	799	64.4	323
Marital status				
Never married	90.4	1,608	66.3	1,437
Married	3.1	2,134	58.1	55
Living together	16.4	285	(46.7)	42
Divorced/separated	92.9	153	61.8	135
Widowed	76.8	141	71.2	99
Type of union				
In polygynous union	8.0	244	*	15
Not in polygynous union	3.8	2,024	49.4	63
Not currently in union	89.8	1,902	66.2	1,671
Don't know/missing	24.3	173	(51.1)	39
Education				
No education	26.9	214	(56.3)	44
Primary	33.8	1,193	63.2	367
Secondary	45.6	1,308	63.2	578
High school	52.4	1,166	67.9	592
Tertiary	46.9	454	66.9	206
Wealth quintile				
Lowest	42.3	954	59.7	376
Second	43.7	937	68.6	379
Middle	44.7	1,004	61.6	410
Fourth	44.0	706	67.5	305
Highest	44.7	740	68.6	318
Age				
15-19	89.4	306	69.0	268
20-24	69.9	766	63.1	529
25-29	47.8	794	63.9	373
30-34	37.5	727	62.1	259
35-39	27.9	533	74.1	138
40-44	31.7	362	65.3	107
45-49	18.6	283	57.9	52
50-54	18.0	205	(77.0)	33
55-59	10.1	149	*	13
60-64	13.1	99	*	12
65+	5.6	119	*	4
15-29	63.3	1,866	64.6	1,170
20-39	47.5	2,820	64.4	1,299
25+	33.1	3,271	65.2	991
Total 15-24	75.1	1,072	65.0	797
Total 15-49	47.0	3,771	64.9	1,726
Total 15+	43.9	4,343	65.1	1,788

[1]Relates to Global AIDS Monitoring indicator 3.18: Condom use at last high-risk sex.

Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.

Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed.

The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

Table 15.4.C Condom use at last sex with a non-marital, non-cohabitating partner: Total

Among persons aged 15 years and older who reported having sex in the past 12 months, percentage who reported having a non-marital, non-cohabitating partner in the past 12 months; among those who reported having sex with a non-marital, non-cohabitating partner in the past 12 months, percentage who reported using a condom the last time they had sex with a non-marital, non-cohabitating partner, by selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Among persons who reported having sex in the past 12 months		Among persons who reported having sex with a non-marital, non-cohabitating partner in the past 12 months	
	Percentage who reported having sex with a non-marital, non-cohabitating partner in the past 12 months	Number	Percentage who reported using a condom the last time they had sex with a non-marital, non-cohabitating partner[1]	Number
Residence				
Urban	52.6	1,843	70.5	938
Rural	46.6	5,778	68.7	2,481
Region				
Hhohho	46.7	2,338	70.9	1,020
Lubombo	47.6	1,546	64.5	691
Manzini	49.8	2,404	70.9	1,120
Shiselweni	49.2	1,333	67.9	588
Marital status				
Never married	92.6	3,011	70.8	2,731
Married	5.7	3,613	63.7	182
Living together	20.7	507	54.5	97
Divorced/separated	92.3	279	64.4	245
Widowed	81.4	176	71.2	132
Type of union				
In polygynous union	14.3	345	(60.6)	40
Not in polygynous union	6.8	3,587	59.6	214
Not currently in union	92.1	3,466	70.3	3,108
Don't know/missing	26.8	223	55.6	57
Education				
No education	27.1	407	66.8	91
Primary	38.4	2,164	66.3	742
Secondary	50.3	2,065	66.9	990
High school	58.2	2,123	71.2	1,189
Tertiary	50.0	849	74.1	405
Wealth quintile				
Lowest	45.5	1,596	65.4	669
Second	49.1	1,608	70.9	714
Middle	49.9	1,767	65.1	804
Fourth	49.2	1,280	70.7	608
Highest	47.8	1,368	74.7	624
Age				
15-19	92.5	496	76.2	447
20-24	80.4	1,223	69.7	949
25-29	60.2	1,339	69.6	780
30-34	45.6	1,208	64.5	523
35-39	31.4	925	70.0	281
40-44	30.2	659	65.4	190
45-49	17.8	499	68.4	85
50-54	18.7	382	75.5	67
55-59	15.3	306	(57.8)	40
60-64	13.7	248	(71.3)	32
65+	8.5	336	(52.5)	25
15-29	73.1	3,058	70.8	2,176
20-39	56.7	4,695	68.7	2,533
25+	37.4	5,902	67.7	2,023
Total 15-24	83.4	1,719	71.4	1,396
Total 15-49	53.4	6,349	69.3	3,255
Total 15+	48.3	7,621	69.3	3,419

[1]Relates to Global AIDS Monitoring indicator 3.18: Condom use at last high-risk sex.

Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.

The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

15.5 Male Circumcision

Among adult males, 70.7% self-reported as uncircumcised; 26.7% had received medical circumcision; and few (0.9%) had received nonmedical circumcision. Self-reported medical circumcision was highest in adult males who never married (31.7%) and who were in the highest wealth quintile (33.9%). Self-reported medically circumcised adult males were nearly two times the percentage in those not currently in a union (30.6%) compared to those in polygynous union (15.8%) and three times the percentage of those attended tertiary education (31.7%) versus those with no education (10.4%; Table 15.5.A).

One-third (34.8%) of adult males aged 15-24 years self-reported as medically circumcised. Self-reported medical circumcision among all adult males was highest in ages 15-19 years (38.2%) and decreased by age groups to the lowest percentage in ages 65 years and older (7.5%; Table 15.5.A).

Among adult males who tested HIV positive in the survey, 15.2% reported as medically circumcised. Of adult males who tested HIV negative in the survey, 29.7% reported as medically circumcised (Table 15.5.A).

Table 15.5.A Male circumcision

Percent distribution of males aged 15 years and older by self-reported circumcision status, by result of PHIA survey HIV test and selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Circumcised[1]		Uncircumcised	Unknown	Total	Number
	Medical circumcision	Nonmedical circumcision				
Result of PHIA survey HIV test						
HIV positive	15.2	0.9	82.3	1.7	100.0	972
HIV negative	29.7	0.9	68.0	1.5	100.0	3,534
Not tested	27.1	1.5	67.8	3.6	100.0	398
Residence						
Urban	29.2	1.2	68.1	1.4	100.0	1,100
Rural	25.7	0.8	71.7	1.8	100.0	3,804
Region						
Hhohho	26.6	0.9	70.5	1.9	100.0	1,536
Lubombo	25.7	0.2	72.4	1.7	100.0	1,017
Manzini	29.0	1.3	68.5	1.2	100.0	1,497
Shiselweni	22.9	0.9	73.7	2.5	100.0	854
Marital status						
Never married	31.7	0.5	66.5	1.3	100.0	2,772
Married	19.6	1.2	77.0	2.3	100.0	1,596
Living together	20.8	2.0	75.3	2.0	100.0	228
Divorced/separated	22.3	2.5	73.7	1.5	100.0	181
Widowed	8.0	3.6	83.4	4.9	100.0	99
Type of union						
In polygynous union	15.8	0.9	80.2	3.1	100.0	110
Not in polygynous union	19.9	1.3	76.6	2.2	100.0	1,672
Not currently in union	30.6	0.7	67.3	1.4	100.0	3,052
Don't know/missing	26.0	1.5	69.5	3.0	100.0	70
Education						
No education	10.4	2.3	81.4	5.8	100.0	276
Primary	23.3	1.1	73.5	2.0	100.0	1,496
Secondary	28.2	0.5	70.2	1.0	100.0	1,294
High school	29.4	0.6	68.7	1.3	100.0	1,373
Tertiary	31.7	1.5	65.0	1.8	100.0	458
Wealth quintile						
Lowest	23.7	0.8	72.8	2.8	100.0	1,093
Second	25.4	0.6	72.5	1.5	100.0	1,042
Middle	24.5	0.5	73.5	1.4	100.0	1,153
Fourth	26.8	1.7	70.0	1.5	100.0	797
Highest	33.9	1.2	63.5	1.4	100.0	818
Age						
15-19	38.2	0.1	60.4	1.3	100.0	1,074
20-24	31.2	0.4	67.4	1.0	100.0	709
25-29	27.9	1.1	69.8	1.2	100.0	642
30-34	25.1	0.7	72.2	1.9	100.0	541
35-39	27.4	0.5	70.8	1.4	100.0	453
40-44	21.6	1.4	75.0	1.9	100.0	323
45-49	16.9	1.5	79.2	2.5	100.0	246
50-54	15.5	1.6	80.6	2.3	100.0	214
55-59	14.1	0.5	83.5	1.9	100.0	188
60-64	15.1	4.8	78.1	2.0	100.0	176
65+	7.5	2.7	84.2	5.6	100.0	338
20-39	28.3	0.7	69.7	1.3	100.0	2,345
25+	21.9	1.3	74.7	2.1	100.0	3,121
Total 15-24	34.8	0.2	63.8	1.1	100.0	1,783
Total 15-49	29.3	0.7	68.6	1.4	100.0	3,988
Total 15+	26.7	0.9	70.7	1.7	100.0	4,904

[1]Relates to Global AIDS Monitoring indicator 3.16: Prevalence of male circumcision and PEPFAR VMMC_TOTALCIRC NAT / SUBNAT.
The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

15.6 Gaps and Unmet Needs

- Although early sexual debut was uncommon among adults, half of women who had first sexual intercourse before 15 years of age were HIV positive. Sexual health programs among early adolescents can continue to reinforce the importance of delayed sexual debut, notably among females but also males, to maintain adolescent health and well-being.
- Sexual activity with non-marital, non-cohabitating partners is frequent, especially among adults who are married or living with a partner and is accompanied by insufficient condom use at last sex. Condom promotion among adults practicing high risk behaviors remains an area in need of more effective strategies.
- Medical circumcision uptake is substantially below the national target of 70% and risks new infections that are preventable among men aged 15 years and older. There is a critical need for culturally informed MC mobilization efforts.

16 INTIMATE PARTNER VIOLENCE

16.1 Key Findings

- Among ever married or partnered (i.e. having a cohabitating partner) females aged 15 years and older, 3.6% reported intimate partner violence (IPV) in the 12 months prior to the survey. IPV peaked at 9.8% among those aged 20-24 years.
- Among ever married or partnered females aged 15-24 years, over a tenth (11.2%) experienced IPV in the 12 months prior to the survey.
- IPV was higher among ever married or partnered females aged 15 years and older testing HIV positive in the survey (5.9%) compared to those testing HIV negative in the survey (2.3%).
- Among females aged 15 years and older, 5.2% had experienced physical violence in their lifetime. Lifetime physical violence was highest among those aged 20-24 years (9.2%).

16.2 Background

Intimate partner violence (IPV) includes physical violence, sexual violence, stalking and psychological aggression (including coercive tactics) by a current or former intimate partner, such as a spouse, boyfriend, dating partner, or ongoing sexual partner.[1] Exposure to IPV has been implicated in an increased risk of a woman contracting HIV, through mechanisms such as forced sex with an infected partner, an increase in risky sexual behaviors, and reduced ability to negotiate safe sex.[2]

IPV is defined in this survey as physical or sexual violence by a current or former male intimate partner (i.e., a cohabitating partner, regardless of marital status). Violence questionnaires were administered to one randomly selected adult female (defined in this survey as those aged 15 years and older, unless otherwise noted) in each household. Physical violence was classified as being punched, kicked, whipped, beaten, slapped, pushed, shoved, choked, smothered, drowned or burned. It also included having an object thrown at oneself or being hurt or threatened with a knife, gun or other weapon. Sexual violence was specified as being physically forced to have sex.

This chapter describes the occurrence of physical and sexual violence among adult females generally and among those who report having had a male intimate partner in their lifetime. Women reporting violence were offered referral to social services (Appendix I).

16.3 Intimate Partner Violence in the Prior 12 Months

Among ever married or partnered (i.e. having a cohabitating partner) adult females, 3.6% experienced IPV in the 12 months prior to the survey. Reported intimate partner violence mainly comprised physical violence (3.6%) compared with 0% sexual violence (Table 16.3.A).

IPV among ever married or partnered adult females was higher in those not in polygynous unions (4.1%) and highest in those not reporting any type of union (9.4%). IPV was highest among ever married or partnered adult females who attended secondary education (5.8%), next highest in those who attended primary education (4%), and lowest in those with no education (0.4%). IPV among ever married or partnered adult females was lowest in Manzini region (2.9%; Table 16.3.A).

IPV was highest among ever married or partnered adult females who tested HIV positive in the survey (5.9%), and next highest in those who did not receive HIV testing in the survey (4.2%; Table 16.3.A).

Among ever married or partnered adult females aged 15-24 years, over a tenth (11.2%) reported IPV in the 12 months prior to the survey, all of whom (11.2%) reported intimate partner physical violence while none (0%) reported intimate partner sexual violence. Reported IPV was highest in ages 20-24 years (9.8%), followed by ages 25-29 years (6.9%) and ages 30-34 years (4.1%). Few reports of IPV occurred in adult females aged 50 years and older (Table 16.3.A).

The estimates of IPV are lower than findings from other nationally-representative surveys in Eswatini. IPV is likely under-reported in SHIMS2, and results should be interpreted with caution.

Table 16.3.A Intimate partner violence

Among ever married or partnered women aged 15 years and older, percentage who experienced physical or sexual violence from a male partner in the past 12 months, by woman's HIV status and selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Physical violence[1]	Sexual violence[2]	Physical and sexual violence	Physical or sexual violence[3]	Number of ever-married or partnered women
Result of PHIA survey HIV test					
HIV positive	5.9	0.0	0.0	5.9	481
HIV negative	2.3	0.1	0.1	2.3	895
Not tested	4.2	0.0	0.0	4.2	58
Residence					
Urban	3.7	0.0	0.0	3.7	317
Rural	3.6	0.1	0.1	3.6	1,117
Region					
Hhohho	4.2	0.0	0.0	4.2	430
Lubombo	4.5	0.0	0.0	4.5	274
Manzini	2.9	0.0	0.0	2.9	439
Shiselweni	3.2	0.3	0.3	3.2	291
Marital status					
Never married	*	*	*	*	0
Married	3.4	0.0	0.0	3.4	861
Living together	8.3	0.4	0.4	8.3	152
Divorced/separated	2.2	0.0	0.0	2.2	94
Widowed	1.4	0.0	0.0	1.4	320
Type of union					
In polygynous union	2.2	0.0	0.0	2.2	87
Not in polygynous union	4.1	0.1	0.1	4.1	865
Not currently in union	1.6	0.0	0.0	1.6	414
Don't know/missing	9.4	0.0	0.0	9.4	68
Education					
No education	0.4	0.0	0.0	0.4	181
Primary	4.0	0.0	0.0	4.0	500
Secondary	5.8	0.0	0.0	5.8	347
High school	2.7	0.0	0.0	2.7	255
Tertiary	2.3	0.4	0.4	2.3	146
Wealth quintile					
Lowest	3.6	0.0	0.0	3.6	356
Second	3.4	0.0	0.0	3.4	308
Middle	5.1	0.2	0.2	5.1	304
Fourth	2.7	0.0	0.0	2.7	247
Highest	3.2	0.0	0.0	3.2	219
Age					
15-19	*	*	*	*	7
20-24	9.8	0.0	0.0	9.8	76
25-29	6.9	0.0	0.0	6.9	174
30-34	4.1	0.3	0.3	4.1	227
35-39	2.3	0.0	0.0	2.3	175
40-44	2.4	0.0	0.0	2.4	127
45-49	2.7	0.0	0.0	2.7	124
50-54	2.1	0.0	0.0	2.1	110
55-59	0.0	0.0	0.0	0.0	81
60-64	0.9	0.0	0.0	0.9	114
65+	0.5	0.0	0.0	0.5	219
15-29	8.5	0.0	0.0	8.5	257
25+	3.0	0.1	0.1	3.0	1,351
Total 15-24	11.2	0.0	0.0	11.2	83
Total 15-49	4.6	0.1	0.1	4.6	910
Total 15+	3.6	0.0	0.0	3.6	1,434

[1] Physical violence was defined as being punched, kicked, whipped, beaten, slapped, pushed, shoved, choked, smothered, drowned or burned. It also included having an object thrown at oneself or being hurt or threatened with a knife, gun or other weapon; [2] Sexual violence was defined as being physically forced to have sex; [3] Relates to Global AIDS Monitoring indicator 4.3: Prevalence of recent intimate partner violence.

The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

Estimates with an asterisk are based on a very small number (less than 25) of unweighted cases and have been suppressed.

16.4 Physical and Sexual Violence in the Prior 12 Months

Among adult females, 5.2% had experienced physical violence in the 12 months prior to the survey. Physical violence in adult females was higher in rural areas (5.6%) than in urban areas (4.1%). It was highest among adult females who lived with their partner (10.7%), completed primary education (6.0%), and lived in Shiselweni region (7.2%; Table 16.4.A).

Among adult females aged 15-24 years, 5.8% had experienced physical violence in the 12 months prior to the survey. Among adult females aged 15-29 years, 6.4% had experienced physical violence: 2.1% in ages 15-19 years, 9.2% in ages 20-24 years, and 7.8% in ages 25-29 years. Physical violence among adult females peaked in ages 20-24 years at 9.2% (Table 16.4.A).

Among adult females, 0.2% had experienced sexual violence in the 12 months prior to the survey. Among adult females aged 15-24 years, 0.1% had experienced sexual violence in the 12 months prior to the survey. There were no meaningful differences in reported sexual violence in the prior 12 months within demographic groups (Table 16.4.A).

The estimates of physical and sexual violence are lower than results from other nationally-representative surveys in Eswatini. Violence is likely under-reported in SHIMS2, and results should be interpreted with caution.

Table 16.4.A Physical and sexual violence

Among women aged 15 years and older, percentage who experienced physical violence or sexual violence in the past 12 months by selected demographic characteristics, SHIMS2 2016-2017

Characteristic	Physical violence [1]		Sexual violence [2]	
	Percentage	Number	Percentage	Number
Residence				
Urban	4.1	584	0.1	797
Rural	5.6	1,835	0.2	2,596
Region				
Hhohho	6.0	711	0.1	994
Lubombo	4.5	453	0.1	671
Manzini	3.7	788	0.1	1,092
Shiselweni	7.2	467	0.3	636
Marital status				
Never married	4.5	838	0.2	1,152
Married	5.3	952	0.0	1,378
Living together	10.7	161	0.3	195
Divorced/separated	6.3	103	0.0	147
Widowed	3.1	356	0.1	509
Type of union				
In polygynous union	4.1	98	0.0	143
Not in polygynous union	5.8	948	0.0	1,337
Not currently in union	4.4	1,297	0.2	1,808
Don't know/missing	12.8	76	1.5	105
Education				
No education	3.1	223	0.1	317
Primary	6.0	709	0.2	1,019
Secondary	4.9	686	0.0	941
High school	5.9	557	0.3	782
Tertiary	3.3	239	0.2	327
Age				
15-19	2.1	215	0.0	293
20-24	9.2	300	0.3	399
25-29	7.8	317	0.1	450
30-34	6.0	343	0.4	474
35-39	3.3	249	0.0	349
40-44	3.8	167	0.0	254
45-49	5.4	167	0.5	231
50-54	5.0	139	0.0	188
55-59	1.5	104	0.0	153
60-64	2.2	153	0.0	209
65+	1.4	265	0.1	393
15-29	6.4	832	0.1	1,142
25+	4.9	1,904	0.2	2,701
Total 15-24	5.8	515	0.1	692
Total 15-49	5.6	1,758	0.2	2,450
Total 15+	5.2	2,419	0.2	3,393

[1] Physical violence was defined as being punched, kicked, whipped, beaten, slapped, pushed, shoved, choked, smothered, drowned or burned. It also included having an object thrown at oneself or being hurt or threatened with a knife, gun or other weapon; [2] Sexual violence was defined as being physically forced to have sex.

16.5 Gaps and Unmet Needs

- Violence prevention interventions may benefit from more tailored strategies for the protection of young women, particularly among ages 20-24 years.
- The prevalence of violence experienced by men is unknown and demonstrates a need for future violence assessments to be conducted among both women and men.

16.6 References

1. U.S. Centers for Disease Control (CDC). *Intersection of Intimate Partner Violence and HIV in Women*. Atlanta: CDC; 2014. https://www.cdc.gov/violenceprevention/pdf/ipv/13_243567_green_aag-a.pdf. Accessed October 3, 2018.

2. Maman S, Campbell J, Sweat MD, Gielen AC. The intersections of HIV and violence: directions for future research and interventions. *Soc Sci Med.* 2000 Feb;50(4):459-78.

17 TUBERCULOSIS

17.1 Key Findings

- One-third (34.8%) of self-reported adults living with HIV aged 15 years and older attended a health facility for tuberculosis (TB) services.
- A large majority (97.9%) of self-reported HIV-positive adults aged 15 years and older, who report attending TB services and a TB diagnosis, reported receipt of TB treatment.

17.2 Background

TB remains the leading cause of HIV-associated morbidity and mortality, despite being preventable and curable. To reduce the burden of TB among people living with HIV, integration of HIV and TB services is emphasized in all MOH facilities in Eswatini. TB screening is routinely conducted among HIV-positive patients according to national health guidelines. TB diagnostic investigations are performed among those who present with TB signs or symptoms. This chapter describes the self-reported TB clinical care cascade for HIV-positive individuals: received care at a TB clinic, TB diagnosis among those receiving care, and treatment among those diagnosed with TB.

17.3 Tuberculosis

Among self-reported HIV-positive adults (defined in this survey as those aged 15 years and older, unless otherwise noted), one-third (34.8%) reported ever having visited a health facility for TB services: 41.1% of males and 32.0% of females. Among self-reported adults living with HIV who visited a facility for TB services, 60.1% were diagnosed with TB. TB diagnosis was higher in males (69.7%) than in females (54.6%). Among self-reported HIV-positive adults who were diagnosed with TB, a large majority (97.9%) received TB treatment (98.1% in males and 97.8% in females; Table 17.3.A).

Table 17.3.A Tuberculosis clinic attendance and services among HIV-positive adults

Among self-reported HIV-positive persons aged 15 years and older, percentage who ever visited a tuberculosis (TB) clinic; among those who had ever visited a TB clinic, percentage who were diagnosed for TB; and among those diagnosed with TB, percentage who were treated for TB, by sex, SHIMS2 2016-2017

	Among HIV-positive persons		Among HIV-positive persons who ever visited a TB clinic		Among HIV-positive persons who were diagnosed with TB	
Characteristic	Percentage who ever visited a TB clinic	Number	Percentage who were diagnosed with TB	Number	Percentage who were treated for TB	Number
Sex						
Male	41.1	809	69.7	337	98.1	237
Female	32.0	1,885	54.6	604	97.8	327
Total 15+	34.8	2,694	60.1	941	97.9	564

17.4 Gaps and Unmet Needs

- One-third of self-reported HIV-positive adults reported attending a clinic for TB services. Continued efforts to increase TB screening among all people living with HIV is necessary to ensure prevention and management of HIV/TB co-infection.

18 FOOD AND WATER SECURITY

18.1 Key Findings

- Across the four regions, food insecurity in the four weeks prior to the survey was higher in Shiselweni region (39.6%) and Lubombo region (35.5%).
- The percentage of households experiencing water insecurity for hygiene was more than twice as high in rural areas (15.5%) than in urban areas (6.1%).
- Food shortages occurred in more than a third (34.7%) of female-headed households compared with 26.2% of male-headed households.

18.2 Background

Food and water insecurity have increased in severity and frequency in southern Africa and is associated with increased high-risk sexual behavior among women and increased HIV acquisition risk in rural areas.[1, 2] Recent episodes of recurrent drought in 2015-2016, which caused some of the driest crop seasons in recent history, combined with high unemployment rates, resulted in increased risk for food and water insecurity in Eswatini.[3]

18.3 Food and Water Security

In the four weeks prior to the survey, almost a third (30.8%) of households in Eswatini reported a food shortage. A food shortage occurred at least 10 times in 2.4% of households in four weeks prior to the survey. Food shortages were higher in rural households (37.0%) than in urban households (17.9%) and in Shiselweni (39.6%) and Lubombo (35.5%) regions. Food shortages occurred in a third (34.7%) of female-headed households compared with 26.2% of male-headed households (Table 18.3.A).

In the four weeks prior to the survey, 16.9% of households lacked water for nutritional needs for at least 24 hours. Nutritional water shortages were higher in rural households (19.9%) than in urban households (10.8%) and were slightly higher in female-headed households (18.0%) than in male-headed households (15.6%). More than a tenth (12.4%) of households lacked water for hygiene purposes for at least 24 hours in the four weeks prior to the survey. Hygiene water shortages were more than twice as high in rural households than in urban households (15.5% and 6.1%, respectively; Table 18.3.A).

Table 18.3.A Food and water security among households, SHIMS2 2016-2017

Percent distribution of households by sex of head of household; median size of household and median (Q1, Q3) number of children below 18 years of age, by residence, SHIMS2 2016-2017

	Food insecurity				Water insecurity (for nutrition)				Water insecurity (for hygiene)			
	Household ever without any food in the past 4 weeks		Household often (>10 times) without any food in the past 4 weeks		Household ever without water for nutritional needs for 24 hours in the past 4 weeks		Household often (>10 times) without water for nutritional needs for 24 hours in the past 4 weeks		Household ever without water for hygiene needs for 24 hours in the past 4 weeks		Household often (>10 times) without water for hygiene needs for 24 hours in the past 4 weeks	
Characteristic	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number
Residence												
Urban	17.9	1,406	1.0	1,406	10.8	1,405	1.0	1,405	6.1	1,405	0.8	1,405
Rural	37.0	3,773	3.1	3,773	19.9	3,775	2.5	3,775	15.5	3,774	2.1	3,774
Region												
Hhohho	29.2	1,473	1.8	1,473	17.3	1,472	1.2	1,472	12.2	1,474	0.9	1,474
Lubombo	35.5	1,063	3.3	1,063	21.2	1,064	3.9	1,064	16.9	1,063	3.4	1,063
Manzini	25.6	1,702	1.8	1,702	12.4	1,702	1.5	1,702	8.4	1,701	1.2	1,701
Shiselweni	39.6	941	3.9	941	21.5	942	2.5	942	16.6	941	2.1	941
Household headship												
Male	26.2	2,353	2.2	2,353	15.6	2,354	2.1	2,354	10.9	2,355	1.7	2,355
Female	34.7	2,826	2.6	2,826	18.0	2,826	2.0	2,826	13.7	2,824	1.7	2,824
Total	30.8	5,179	2.4	5,179	16.9	5,180	2.0	5,180	12.4	5,179	1.7	5,179

	Food insecurity				Water insecurity (for nutrition)				Water insecurity (for hygiene)			
	Household ever without any food in the past 4 weeks		Household often (>10 times) without any food in the past 4 weeks		Household ever without water for nutritional needs for 24 hours in the past 4 weeks		Household often (>10 times) without water for nutritional needs for 24 hours in the past 4 weeks		Household ever without water for hygiene needs for 24 hours in the past 4 weeks		Household often (>10 times) without water for hygiene needs for 24 hours in the past 4 weeks	
Characteristic	Median	Q1, Q3	Median	Q1, Q3	Median	Q1, Q3	Median	Q1, Q3	Median	Q1, Q3	Median	Q1, Q3
Size of households	4	2, 6	5	3, 6	4	2, 6	5	3, 7	4	2, 6	5	2, 7
Number of children under 18 years of age	2	0, 4	2	0, 4	2	0, 3	2	0, 4	2	0, 3	2	0, 4

18.4 Gaps and Unmet Needs

- HIV prevention efforts may benefit from targeting rural households and female-headed households with food and water supply interventions during drought, since food and water insecurity may be associated with increases in HIV risk behaviors in vulnerable households.

18.5 References

1. Weiser SD, Leiter K, Bangsberg DR, et al. Food insufficiency is associated with high-risk sexual behavior among women in Botswana and Swaziland. *PLoS Med*. 2007 Oct;4(10):1589-97; discussion 1598. https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.0040260.

2. Burke M, Gong E, Jones K. Income shocks and HIV in Africa. *The Economic Journal* 2015 July;125(585):1157-1189. https://doi.org/10.1111/ecoj.12149.

3. Food Security Information Network. *Global report on food crises. 2017*. Accessed on May 30, 2018 at: https://documents.wfp.org/stellent/groups/public/documents/ena/wfp291271.pdf?_ga=2.50469545.165312196.1527301807-1248861603.1527301807.

CONCLUSION AND RECOMMENDATIONS

SHIMS2 2016-2017 provided critical data on the primary outcomes of HIV incidence among adults, defined as those aged 15 years and older, and HIV prevalence among children, defined as those aged 0-14 years. It allowed for measurement of progress since SHIMS 2011, demonstrating program impact and characterizing the current HIV epidemic in Eswatini. The SHIMS2 team encourages public health staff, programmers, epidemiologists and policy makers to examine the SHIMS2 data for their respective program areas and utilize the data to inform program planning. Overarching recommendations based on SHIMS2 findings are:

HIV incidence: Approximately 6,000 new cases of HIV occurred annually among adults, with HIV incidence highest among women aged 35-49 years and men aged 25-34 years. These high incidence levels demonstrate the need for sustained HIV prevention efforts.

Recommendations:

- Continue to scale-up HIV prevention services, including pre-exposure prophylaxis (PrEP) for not only young but also older women and MC for men above 25 years of age.
- Identify HIV-positive men and young people who are not aware of their status, initiate them on ART, and ensure a sustained high level of VLS among all people living with HIV to interrupt the transmission cycle.

HIV prevalence: Close to half of households in Eswatini had at least one HIV-positive member. Approximately 197,000 adults are living with HIV, where nearly 1 in 2 women aged 30-44 years and men aged 45-49 years are HIV positive. HIV prevalence was significantly higher among adult women, with female youth aged 15-24 years having triple the HIV prevalence of their male peers.

Recommendations:

- HIV programs would benefit from continued scale-up to reach all people living with HIV in Eswatini.
- Program design can better address an aging HIV population, addressing challenges of chronic HIV infection and ART use, as well as comorbidities associated with aging.
- For the high proportion of young females living with HIV, services for prevention of sexual and vertical transmission would benefit from continued scale-up and strengthening of existing services, as well as cervical cancer screening and other reproductive health services.

HIV testing: While the majority of the population had ever tested for HIV, testing in the prior 12 months was very low among older adolescents, aged 15-19 years. Lifetime testing was low among adult males.

Recommendation:

- Strengthen existing services to address the unique needs of youth and men and identify innovations to more effectively target these sub-populations.

90-90-90 target: At population level, Eswatini had achieved the third 90, and was close to achieving the first and second 90's. However, there were significant age and gender disparities, with youth 15-24 years, particularly males in this age group, significantly lagging behind in the first and third 90's.

Recommendations:

- Different HIV testing modalities, such as index testing, community-based testing, self-testing, and couples testing, warrant expansion and strengthening. Innovations targeting youth are urgently needed.
- ART retention programs that tailor to the unique circumstances of youth is key for continued progress toward epidemic control.
- Continue ART adherence counseling and stigma reduction initiatives to maximize ART uptake.
- Expedited scale-up of VL services is critical to support continuous monitoring of VLS by clinicians and their HIV-positive clients.

Clinical characteristics and ARV resistance: Approximately 39% of adults unaware of their HIV status had significant immunosuppression. Among a small sample of recently infected HIV-positive adults, evidence of mutations associated with resistance to non-nucleoside reverse transcriptase inhibitors may exceed the recommended WHO threshold of 10% for replacing a first-line regimen.

Recommendations:

- Efforts are needed to ensure earlier HIV diagnosis before significant immunosuppression occurs.
- Exploring the value of revisions to national first-line regimens is warranted.
- Implement continuous drug resistance surveillance, namely among those with new infections.
- Regularly review the national treatment recommendations to make applicable adjustments.

PMTCT: There was high maternal HIV testing and ART uptake, yet a number of infants aged 18 months and younger acquired HIV. About a tenth of HIV-positive women reported as not breastfeeding, in contrast to national guidelines.

Recommendations:

- The apparent gap between maternal ART uptake and infant HIV acquisition requires further investigation, followed by targeted action to fully realize the highly effective preventive benefits of maternal ART.

Children: About a third of infants aged 0-5 months were not currently breastfed. HIV prevalence was highest among infants 0-17 months of age and young adolescents aged 10-14 years, both at more than 4%. Children living with HIV had not met the first 90 target (with less than three-quarters [71.2%] of children living with HIV diagnosed, based on parental/guardian report) or the third 90 target (with less than three-quarters [73.9%] of children on ART having suppressed viral loads, based on presence of detectable ARVs).

Recommendations:

- Interventions encouraging age-appropriate exclusive breastfeeding and complementary feeding are essential to promote infant health, regardless of infant HIV status.
- Greater efforts to address barriers to HIV testing among children and effective ART and adherence among children who are living with HIV is needed to remedy the low VLS prevalence.

Intimate partner violence: IPV in the prior year occurred in close to 4 out of 100 ever married or partnered adult females. IPV was higher in HIV-positive women. IPV, lifetime physical violence, and lifetime sexual violence peaked among ages 20-24 years, with nearly 1 out of 10 reported as having experienced these forms of violence.

Recommendations:

- Greater understanding of the vulnerabilities to experiencing violence is warranted. Additional information on perpetrators of IPV and gender-based violence in general will be instructive.
- The dearth of evidence on the extent of violence experienced by men limits a gendered approach to violence prevention programs. Opportunities to collect this information is needed.
- Scale-up of interventions mitigating gender-based violence and IPV, particularly among young women, remains imperative.

Food and water security: During times of drought, food and water insecurity is experienced more disproportionately by rural households and female-headed households.

Recommendations:

- Considerations for rural areas and female-headed households may enhance national emergency management plans to mitigate the impact of food and water insecurity on the risk of HIV and other health conditions.

APPENDIX A SAMPLE DESIGN AND WEIGHTING

Appendix A provides a high-level overview of sampling and weighting procedures for SHIMS2 2016-2017. In-depth details are provided in the SHIMS2 2016-2017 Sampling and Weighting Technical Report, which may be found online at the PHIA Project website.

A.1 Sample Design

Overview

The sample design for SHIMS2 is a stratified multistage probability sample design, with strata defined by region and urban/rural status, first-stage sampling units defined by enumeration areas (EAs) within strata, second-stage sampling units defined by households within EAs, and eligible persons within households. The first-stage sampling units (also referred to as "primary sampling units" or PSUs) were stratified by urban/rural status within each of the four regions of the country, and then within each stratum were selected with probabilities proportionate to the number of households in the PSU based on the 2007 census. The allocation of the sample PSUs to the eight sampling strata was made in a manner designed to achieve specified precision levels for a national estimate of HIV incidence rate, and four regional estimates of viral load suppression (VLS) rates.

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 at rates designed to yield a self-weighting (i.e., equal probability) sample within each stratum to the extent feasible.

Within the sampled households, all eligible adults (defined in this survey as those aged 15 years and older) were included in the study sample for data collection. All eligible children (defined in this survey as those aged 0-14 years) in a randomly designated subset of one-half of the selected households were included in the study for data collection.

Population of Inference

The population of inference for SHIMS2 is comprised of individuals who were present in households (i.e., "slept in the household") on the night prior to the date of interview. This population is referred to as the *de facto* population. In contrast, those individuals who are usual residents of the household regardless of whether they were present in the household during the previous night comprise the *de jure* population. All individuals belonging to either the *de facto* or *de jure* populations were included for data collection; however, only members of the *de facto* population are included in the study population.

Precision Specifications and Assumptions

The following specifications were used to develop the sample design for SHIMS2.

- The relative standard error of the national estimate of annual HIV incidence among persons aged 15-49 years should be 20% or less.
- 95% confidence bounds around the estimated VLS rate among HIV-positive persons aged 15-49 years for each of the four regions of the country should be 10% or less.

The following assumptions were used to develop the sample design for SHIMS2:

- An overall HIV prevalence rate of 0.2770 (27.7%) that varies by region and urban/rural status. Source: 2011 Swaziland HIV Incidence Measurement Survey (SHIMS1) conducted from December 2010 to June 2011.1
- An annual HIV incidence rate for adults aged 15-49 years of $P_a = 0.0189$ (1.89%). Source: UNAIDS estimate for 2014.
- A mean duration of recent infections (MDRI) of 130 days, yielding an annualization rate of 365/130= 2.8077. Hence, the estimated incidence rate for MDRI = 130 days is $P_m = 0.0189/2.8077 = 0.0067$ (0.67%).
- A VLS rate among HIV-positive adults aged 15-49 years in each region h of $P_{vh} = 50\%$. $P_{vh} = 50\%$. This is a conservative assumption, because it will overstate the actual variance of the VLS rate.
- An average of 20 occupied sampled households per sampled cluster (PSU).
- An intra-cluster correlation (ICC) of = 0.05 for prevalence and VLS rates. An intraclass of = 0.022 was used for estimates of incidence. The ICC provides an average measure of the homogeneity of responses within the first-stage sampling units.
- An occupancy rate of 89.4% for sampled dwellings. Note that this is not included in the calculation of the overall survey response rate but does determine the initial numbers of dwelling units to be sampled. Source: 2011 Swaziland HIV Incidence Measurement Survey (SHIMS1).
- An overall household response rate of 94.4% among the occupied dwelling units. Source: 2011 Swaziland HIV Incidence Measurement Survey (SHIMS1).
- The average number of persons aged 15-49 years in a household is 2.33. Source: 2011 Swaziland HIV Incidence Measurement Survey (SHIMS1) and 2016 national population projections produced by the Eswatini Central Statistical Office (CSO).
- The percentage of children in households is 37.9%. Source: 2016 national population projections for Swaziland.
- The percentage of persons in households who are 18-49 years of age is 42.6%. Source: 2016 national population projections for Swaziland.
- The percentage of persons in households who are ages 50 years and older is 12.4%. Source: 2016 national population projections for Swaziland.
- Among all adults, an overall biomarker response rate of 77.1% reflecting sample loss due to any of the following reasons: nonparticipation (refusal) of some sample households, nonresponse to the individual interview, refusal to provide a blood sample, or providing a unanalyzable blood sample.
- Among children in the eligible responding households, an overall biomarker response rate of 72.1%. This value is the comparable response rate for adults minus 5.0%.

Selection of the Primary Sampling Units

The first-stage or PSUs for SHIMS2 are defined to be the EAs created for the 2007 Swaziland Census of Population and Housing. The 2007 sampling frame consisted of 2,064 EAs containing an estimated 212,000 households and 1,005,000 persons, with an average number of households and persons per EA of 103 and 487, respectively. A stratified sample of 287 EAs was selected from the final EA sampling frame in accordance with the sample allocation. The eight strata specified for sampling were defined by crossing the four regions Hhohho, Manzini, Shiselweni, and Lubombo by urban/rural status. The EA samples were selected systematically and with probabilities proportionate to a measure of size (MOS)

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[1] SHIMS report: https://www.k4health.org/sites/default/files/SHIMS_Report.pdf

[2] This estimate was derived from tabulations of the 2011 SHIMS data files.

within each stratum. The MOS used for sampling was equal to the number of households in the EA based on the 2007 Census of Population and Housing.

The first step of the sampling process was to divide the sampling frame of EAs into the eight strata. Next, within each stratum, the EAs were sorted by the unique 5-digit EA identification code. The sorting of the EAs prior to sample selection induces an implicit stratification of the sampling frame designed to ensure that a representative mix of EAs with respect to geography are included in the sample. To select the sample from a particular stratum, the cumulative MOS was determined for each EA in the ordered list of EAs, and the sample selections were designated using a sampling interval equal to the total MOS of the EAs in the stratum divided by the number of EAs to be selected and a random starting point. The resulting sample has the property that the probability of selecting an EA within a particular stratum is proportional to the MOS of the EA in the stratum.

Details regarding EA substitution and segmentation may be found in the SHIMS2 2016-2017 Sampling and Weighting Technical Report.

Selection of Households

For both sampling and analysis purposes, a household is defined to be 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 is referred to as the "dwelling unit" which may contain more than one household meeting the above definition. Households are eligible for participation in the study if they are located within the sampled EA.

The selection of households for SHIMS2 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) selecting the samples of dwelling units/households, and (4) designating a subsample of households for child data collection.

A description of the household listing process as well as a summary of household eligibility may be found in the SHIMS2 2016-2017 Sampling and Weighting Technical Report.

Selection of households utilized an equal probability design. In order to achieve an equal probability sample of dwelling units within each of the four regions of the country, the sampling rates required to select dwelling units within an EA will depend on the difference between the size measure used in sampling (i.e., the number of households in the EA based on the 2007 census) and the actual number of dwelling units/households found at the time of listing in mid-2016. Thus, application of these within-EA sampling rates can yield more than the desired 20 households in EAs that have experienced growth in population since the 2007 census, and fewer than 20 households in EAs that have declined in population. The SHIMS2 2016-2017 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 SHIMS2 involved the following steps: (1) compiling a list of all individuals known to reside in the household or who slept in the household during the night prior to data collection; (2) identifying those rostered individuals who are eligible for data collection; and (3) selecting for the study those individuals meeting the age and residency requirements of the study. However, only those

individuals who were present in the household the night before the interview (i.e., the *de facto* population) are retained for subsequent weighting and analysis.

The SHIMS2 2016-2017 Sampling and Weighting Technical Report provides a brief description of the process for listing and selecting individuals for participation in SHIMS2, and also 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 (e.g., 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 to be 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 SHIMS2, nonresponse can occur 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 usable 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, the post stratification procedures are used to calibrate the weighted sample counts to available population projections.

Methods

The overall weighting approach for SHIMS2 includes several steps. Methods and results for each of the steps below are detailed in the SHIMS2 2016-2017 Sampling and Weighting Technical Report.

- Initial checks: Checks of the data files are carried out as part of the survey and data quality control, and the probabilities of selection for PSUs and households are calculated and checked.

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

- Calculation of PSU base weights: The weighting process begins with the calculation and checking of the sample PSU (EA) base weights, which are computed as the reciprocals of the overall PSU probabilities of selection.

- Calculation of household weights: The next step is to calculate household weights. The household base weights are calculated as the nonresponse adjusted EA weights times the reciprocal of the within-EA household selection probabilities. The household base weights are adjusted first to account for dwelling units for which it could not be determined whether the dwelling unit contained an eligible household (this only happened for 1.0% of the listings) and then the responding households have their weights adjusted to account for nonresponding eligible households. This adjustment is made based on the EA the households are in, and the resulting weight is the final household weight.

- Calculation of person-level interview weights: Once the household weights are determined, they are used to calculate the individual base weights. The individual base weights are 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 weighting up to 2017 population projections produced by the Eswatini CSO.

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

- Application of weighting adjustments to jackknife replicates: All of the adjustment processes are applied to the full sample and the replicate samples so that the final set of full sample and replicate weights can be used for variance estimation that takes into account the complex sample design and every step of the weighting process.

APPENDIX B HIV TESTING METHODOLOGY

B.1 Specimen Collection and Handling

Blood was collected by qualified survey staff from consenting participants. Fourteen milliliters (mL) of venous blood was collected from adults (defined as persons aged 15 years and older), while six mL was collected from persons aged 2-14 years. One mL of capillary blood was collected from children aged 0-2 years using finger-stick for children aged 6-24 months and heel-stick for children aged less than 6 months.

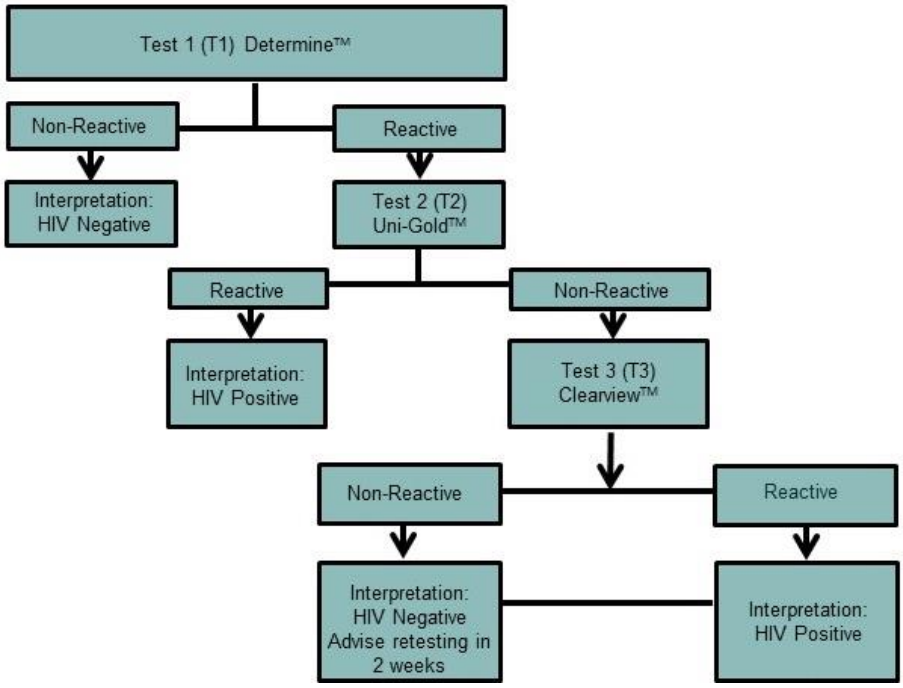
Blood samples were labeled with a unique barcoded participant ID and stored in temperature-controlled cooler boxes. Samples were transported to the national laboratory, the Eswatini Health Laboratory Services (EHLS), for registration in a laboratory data information system, processing into plasma and dried blood spots (DBS), and storage at -20°C within 24 hours of blood collection. Samples for additional testing and long-term storage were stored at -80°C.

B.2 Household-Based Procedures

HIV Rapid Testing

HIV rapid testing was conducted in each household based on Eswatini's national guidelines (Figure B.2.A). Specimens discordant between screening and confirmatory rapid testing underwent additional testing at EHLS, as described in section B.3. For participants who reported being HIV positive but tested HIV negative during the survey, additional testing was conducted at EHLS, as described in section B.3. For children aged less than 18 months, only the initial rapid test was performed. If the test was reactive, the sample underwent additional testing at EHLS, as described in section B.3.

Figure B.2.A Household-based HIV testing algorithm, aged 18 months and older, SHIMS2 2016-2017



CD4 Testing

All participants who tested HIV positive and a random sample of 2.0% of participants who tested HIV negative received a CD4 T-cell count measurement in the field by qualified survey staff. The measurement was performed using a Pima™ Analyzer and Pima™ CD4 Cartridge (Abbott Molecular Inc., Chicago, Illinois, United States, formerly Alere).

Counseling, Referral to Care, and Active Linkage to Care

Pre- and post-test counseling were conducted in each household in accordance with Eswatini's national guidelines. For adults, results were communicated directly to the participant, while for children, aged 0-14 years, results were communicated to the child's parent or guardian. All participants who consented to HIV testing were asked to share contact information and to select a referral health facility. Participants with an HIV-positive test result were referred to HIV care and treatment at the health facility of their choice, while participants with HIV-negative test result by Clearview were advised to seek repeated testing at the health facility of their choice in two weeks. Further, HIV-positive participants were asked to consent to be contacted by qualified healthcare personnel, in order to facilitate active linkage to HIV care and treatment in Eswatini's healthcare system.

In rare cases where participants were provided an incorrect HIV test result, reported an HIV-positive status but tested HIV negative during the survey, 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 staff conducted testing of a panel of HIV-positive and HIV-negative dried tube specimens on a weekly basis. To assure the quality of the performance of field staff conducting HIV testing, proficiency testing using a panel of blinded HIV-positive and HIV-negative dried tube specimens was evaluated twice during the course of fieldwork.

Additionally, sample re-testing was conducted at a laboratory hub for the first 50 samples tested by each field staff member and a random sample of 5.0% of specimens, regardless of HIV status.

A limitation of the survey is the potential limitation of rapid tests to detect HIV antibodies among people in the serological window of early infection, among persons with HIV infection who are on antiretroviral therapy (ART), and in infants aged 4 months and older. Participants in the first two categories are not expected to be a significant source of bias. The inability of rapid tests to reliably establish HIV-exposure status of an infant by detecting maternal HIV antibodies among infants aged 4 months and older and born to HIV-positive women, is another inherent limitation of the study. WHO currently recommends rapid tests to establish exposure status only in infants aged 4 months and younger.[1] Further analysis will identify how many infants born to HIV-positive women were not identified by a rapid test.

B.3 Laboratory-Based Procedures

Four survey laboratory hubs were established in existing health facility laboratories across the country. One central laboratory was established at EHLS in Mbabane, Eswatini.

Geenius Testing

Samples with discrepant screening and confirmatory rapid test results were tested using the Geenius™ HIV 1/2 Supplemental Assay (Bio-Rad, Hercules, California, United States) (Figure B.3.A). Testing was conducted at EHLS in accordance with the manufacturer-specified protocol.

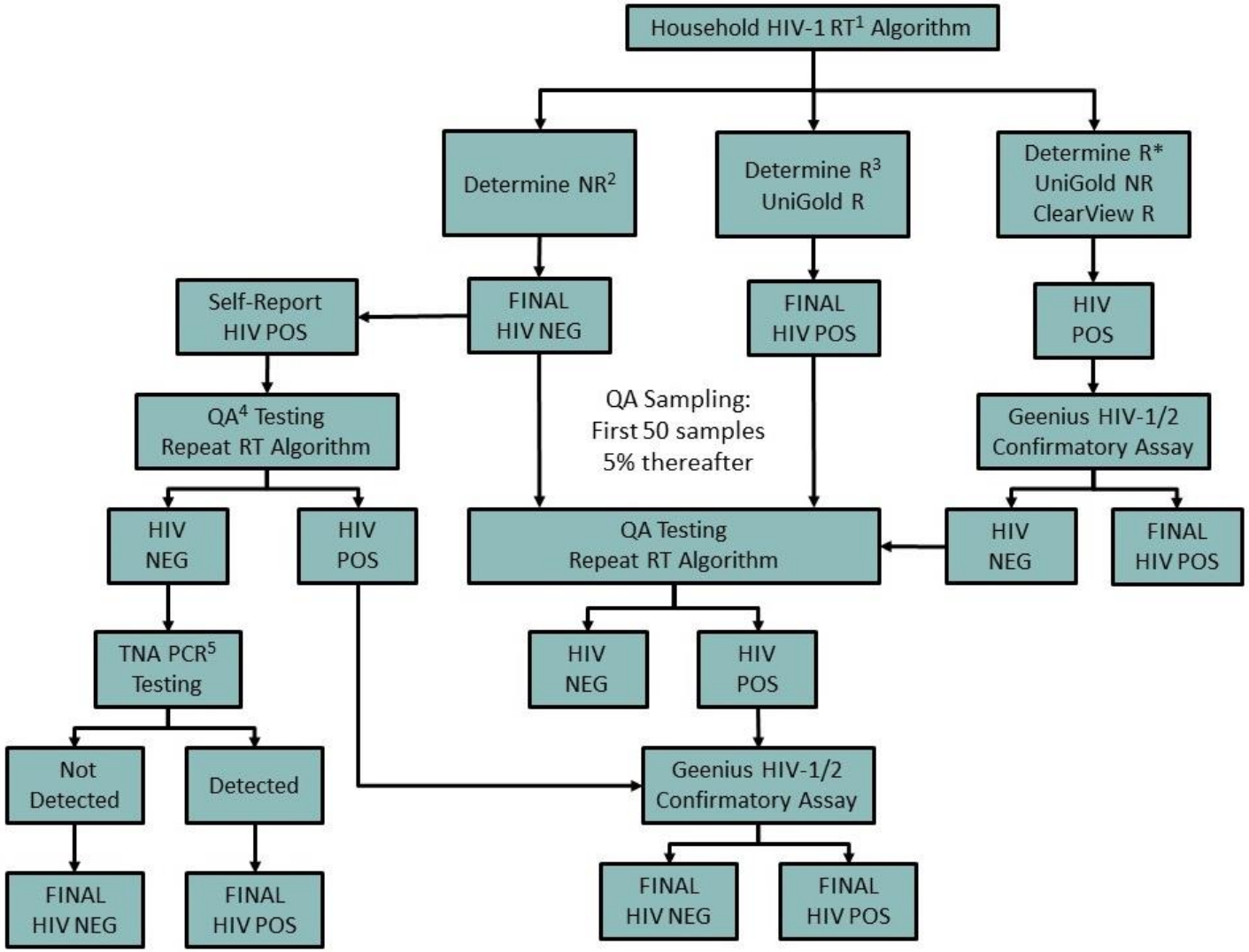
HIV TNA PCR

HIV total nucleic acid (TNA) polymerase chain reaction (PCR) was conducted for children aged less than 18 months who had a reactive HIV test result during household-based testing (Figure B.3.A). Additionally, HIV TNA PCR was evaluated for participants who reported being HIV positive 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 by Geenius testing (Figure B.3.B). HIV TNA PCR was conducted using the Roche COBAS® AmpliPrep/COBAS® TaqMan® HIV-1 Test, version 2.0 (Roche Molecular Diagnostics, Indianapolis, Indiana, United States) at EHLS in accordance with the manufacturer-specified protocol.

Classification of Final HIV Status

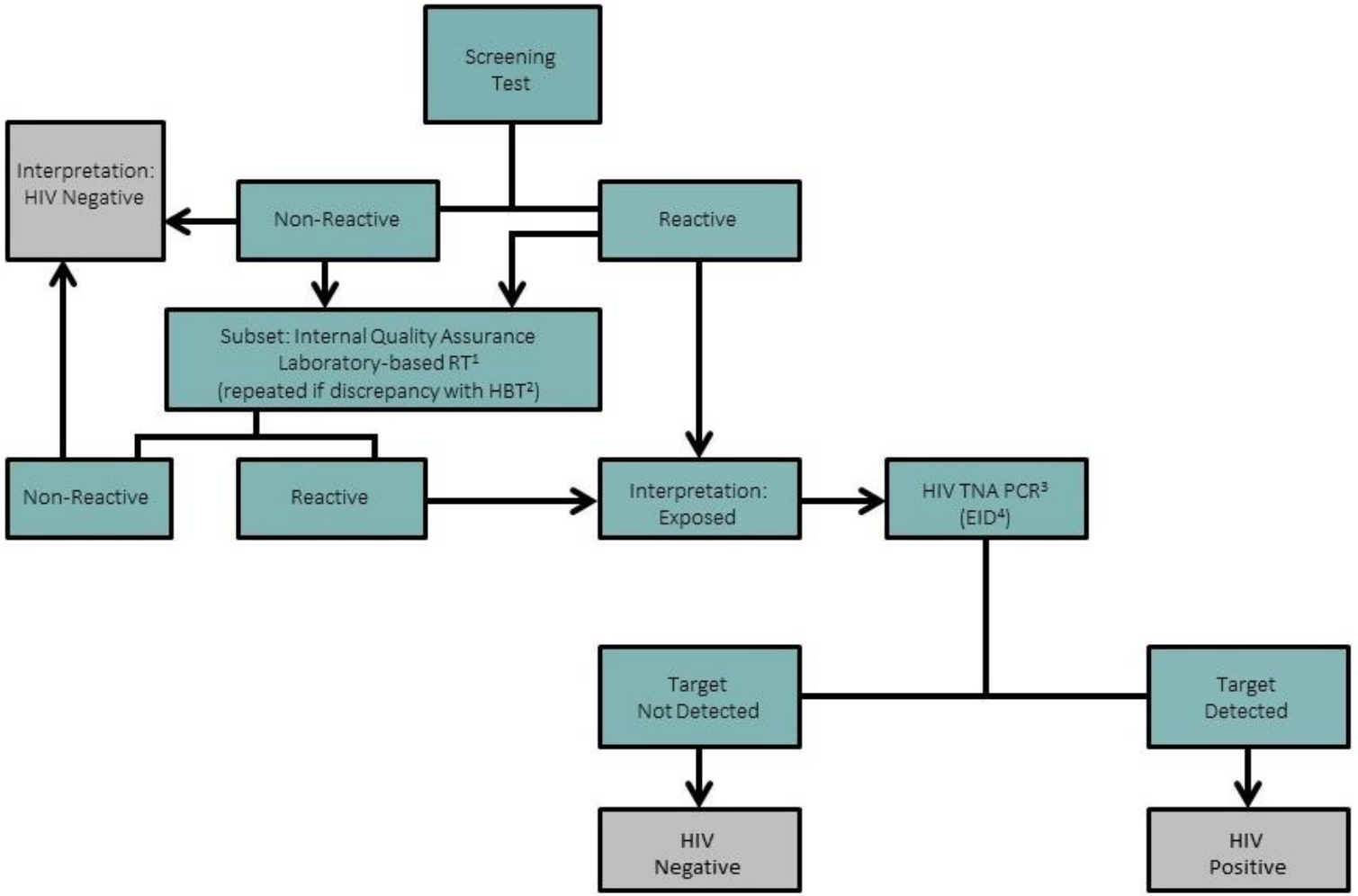
For participants aged 18 months or older, the algorithm for classification of final HIV status included results from HIV rapid testing, Geenius testing, and HIV TNA PCR (Figure B.3.A). For children aged less than 18 months, the algorithm for classification of final HIV status included results from HIV rapid testing and HIV TNA PCR (Figure B.3.B). Classification of final HIV status was used to determine estimates for HIV prevalence and to inform estimates for HIV incidence.

Figure B.3.A Final HIV Status Classification Algorithm (≥18 months), SHIMS2 2016-2017



[1]RT: rapid test; [2]NR: non-reactive; [3]R: reactive; [4]QA: quality assurance; [5]TNA PCR: total nucleic acid polymerase chain reaction

Figure B.3.B Final HIV Status Classification Algorithm (<18 months), SHIMS2 2016-2017



¹RT: rapid testing; ²HBT: home-based testing; ³TNA PCR: total nucleic acid polymerase chain reaction; ⁴EID: early infant diagnosis

Note: Grey boxes indicate a final HIV-status determination

Viral Load Testing

The Roche COBAS Ampliprep/TaqMan HIV-1 Assay (Roche Molecular Diagnostics, Indianapolis, Indiana, United States) was used to prepare plasma samples from confirmed HIV-positive participants for reverse transcription polymerase chain reaction (RT-PCR), using the Roche COBAS Ampliprep. HIV-1 viral load (HIV ribonucleic acid (RNA) copies per mL) was then measured using the Roche TaqMan HIV-1 Assay. The Abbott RealTime HIV-1 Assay (Abbott Molecular Inc., Chicago, Illinois, United States) was used to measure viral load from DBS samples from children and from adults with insufficient volume of plasma.

Viral load results were returned to the health facility chosen by each HIV-positive participant. Participants were provided with a referral form during home-based testing and counseling for subsequent retrieval of their results. Survey staff also contacted participants who provided contact information, informing them that their viral load results were available at the chosen facility and further advising them to seek care and treatment.

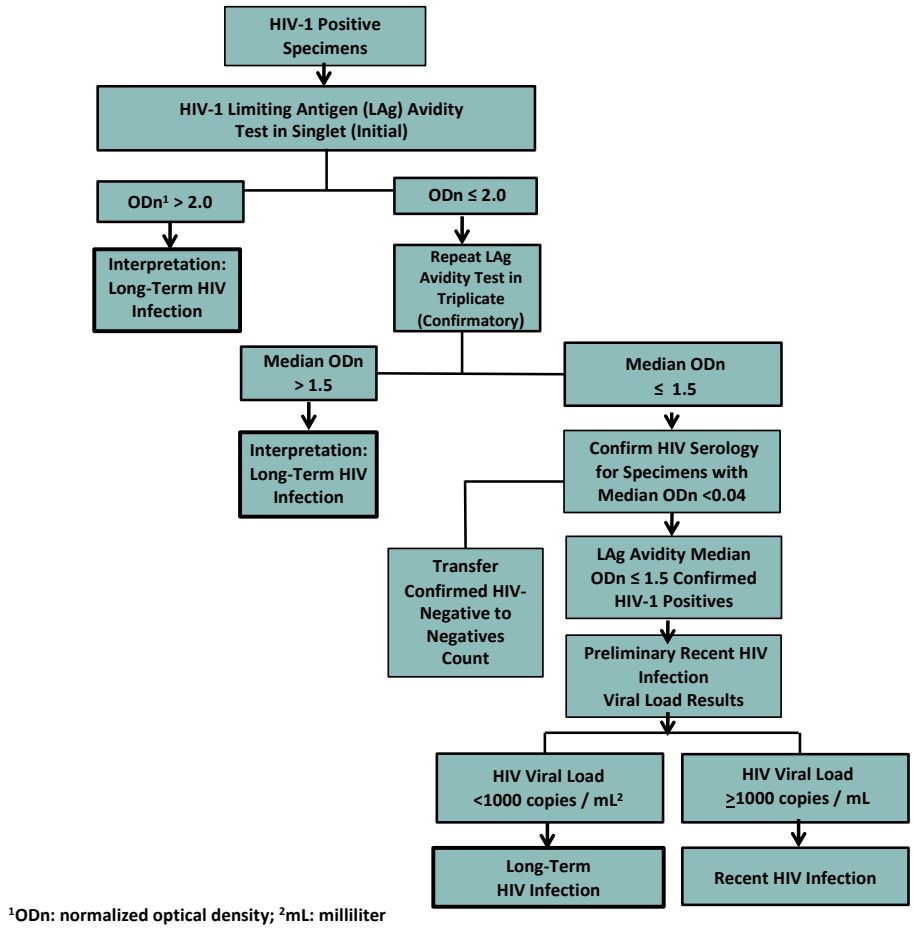
HIV Recency Testing

Estimation of HIV incidence was based on the classification of confirmed HIV-positive cases as recent or long-term infections. The survey used two laboratory-based testing algorithms to estimate incidence. The first estimate used an algorithm that employed a combination of the HIV-1 Limiting Antigen (LAg)-Enzyme Immunoassay (EIA) (Sedia Biosciences Corporation, Portland, Oregon, United States) and viral load results (Figure B.3.C). Antiretroviral (ARV) detection results were added to that algorithm for the second estimate (Figure B.3.D). The HIV recent infection testing algorithms were applied to repository specimens from all confirmed HIV-positive participants 18 months and older.

LAg testing was performed twice, with an initial screening test followed by a confirmatory process. Samples with a normalized optical density (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. Samples with a median $OD_n < 0.4$ were retested using the HIV diagnostic testing algorithm to confirm HIV-1 seropositivity, and samples identified as HIV-1 negative were excluded from the total number of HIV-positives and incorporated into the total number of negative specimens for incidence estimation.

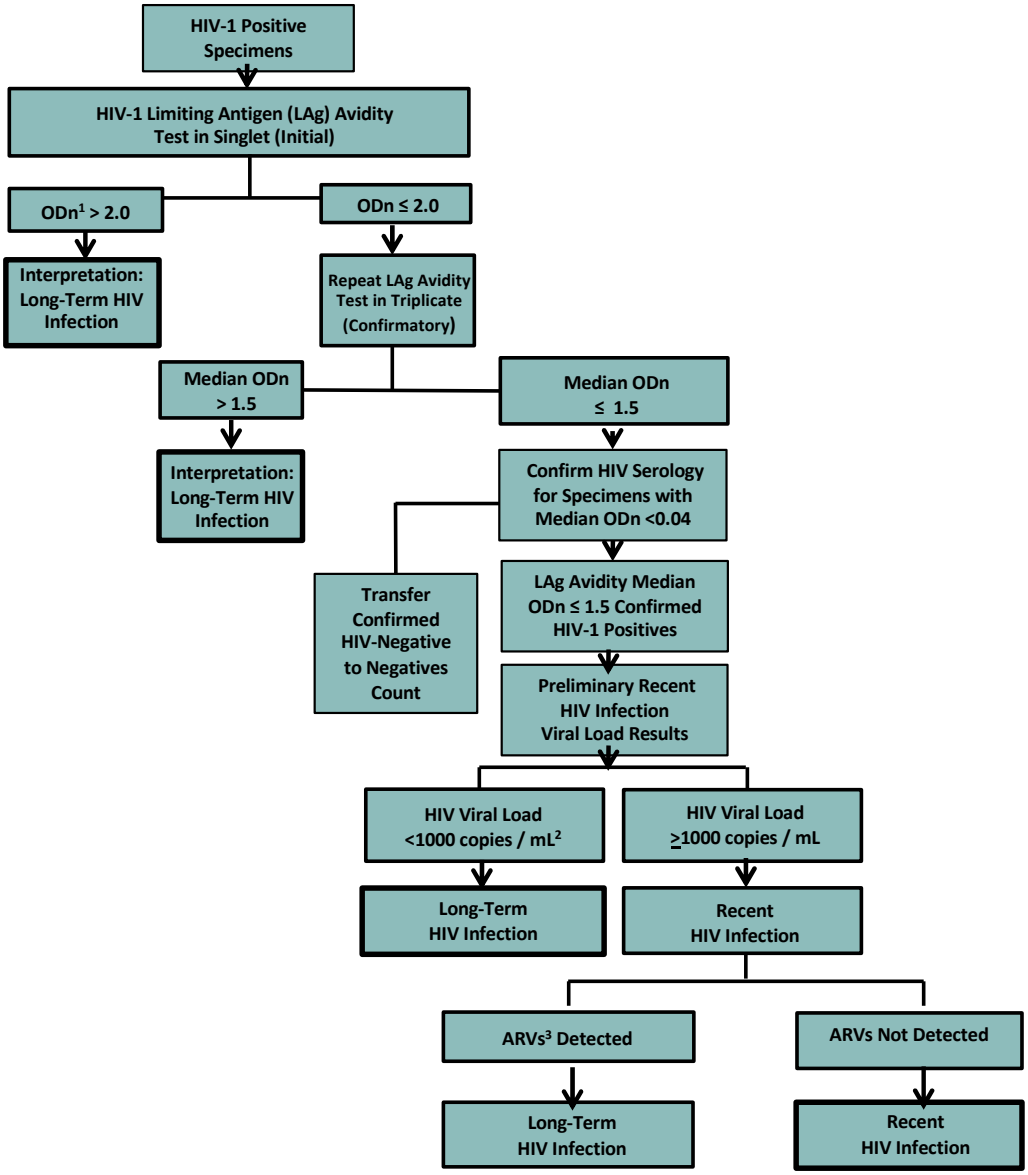
Samples with a median $OD_n \leq 1.5$ were classified as potential HIV-recent infections, and their viral load results were assessed. For the first incidence testing algorithm, specimens with viral load < 1,000 copies/mL were classified as long-term infections, while those with viral load ≥ 1,000 copies/mL were classified as recent infections. For the ARV-adjusted incidence algorithm, those classified as recent infections by the first algorithm were reclassified using ARV detection data. Those samples in which ARVs were detected (i.e., efavirenz, lopinavir, and nevirapine) were classified as long-term infections and those in which no ARVs were detected remained classified as recent infections.

Figure B.3.C HIV-1 Recent Infection Testing Algorithm (LAg/Viral Load), aged 18 months and older, SHIMS2 2016-2017



[1]ODn: normalized optical density; [2]mL: milliliter

Figure B.3.D HIV-1 Recent Infection Testing Algorithm (LAg/viral load/ARV), aged 18 months and older, SHIMS2 2016-2017



[1]ODn: normalized optical density; [2]mL: milliliter; [3]ARVs: antiretrovirals

HIV Incidence Estimation

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. Weighted counts for HIV-negative persons (N); HIV-positive persons (P); numbers tested on the LAg assay (Q); and numbers HIV recent (R) are provided for use in incidence calculations or Joint United Nations Programme on HIV/AIDS Spectrum models (Tables B.3.A, B.3.B). Incidence estimates were calculated using the following parameters: Mean duration recent infection (MDRI) = 130 days (95.0% confidence interval: 118-142 days); proportion false recent (PFR) = 0.00; time cutoff (T) = 1 year. In-depth details are provided in the SHIMS2 2016-2017 Technical Report, which may be found online at the PHIA Project website.

Table B.3.A **Annual HIV incidence auxiliary data: N, P, Q, R, MDRI, PFR, and T**

Annual incidence of HIV among persons aged 15-49, and 15 years and older, by sex and age, SHIMS2 2016-2017

Age	Males				Females				Total			
	Number HIV negative[1] (N)	Number HIV positive[1] (P)	Number tested on LAg assay[1] (Q)	Number HIV recent[1] (R)	Number HIV negative[1] (N)	Number HIV positive[1] (P)	Number tested on LAg assay[1] (Q)	Number HIV recent[1] (R)	Number HIV negative[1] (N)	Number HIV positive[1] (P)	Number tested on LAg assay[1] (Q)	Number HIV recent[1] (R)
15-24	1606.82	68.18	68.18	4.52	1657.53	268.47	268.47	11.17	3273.76	327.24	327.24	15.40
25-34	839.27	206.73	206.73	4.51	876.42	678.58	677.53	5.79	1749.87	851.13	850.17	10.38
35-49	522.31	411.69	411.69	1.27	692.65	704.35	704.35	6.01	1216.18	1114.82	1114.82	7.22
15-49	2965.46	689.54	689.54	10.54	3203.61	1674.39	1673.34	22.87	6208.12	2324.88	2323.88	32.95
15+	3587.28	918.72	918.72	13.13	4338.12	2089.88	2088.72	26.48	7983.51	2950.49	2949.42	39.02

[1]Weighted number

Note: Mean duration recent infection (MDRI) = 130 days (95.0% CI: 118-142 days); proportion false recent (PFR) = 0.00; time cutoff (T) = 1 year

Table B.3.B **Annual HIV incidence auxiliary data incorporating ARV detection into the recent infection algorithm: N, P, Q, R, MDRI, PFR, and T**

Annual incidence of HIV among persons aged 15-49 years and 15 years and older, by sex and age, using LAg/VL/ARVs algorithm, SHIMS2 2016-2017

Age	Males				Females				Total			
	Number HIV negative[1] (N)	Number HIV positive[1] (P)	Number tested on LAg assay[1] (Q)	Number HIV recent[1] (R)	Number HIV negative[1] (N)	Number HIV positive[1] (P)	Number tested on LAg assay[1] (Q)	Number HIV recent[1] (R)	Number HIV negative[1] (N)	Number HIV positive[1] (P)	Number tested on LAg assay[1] (Q)	Number HIV recent[1] (R)
15-24	1606.82	68.18	68.18	2.96	1657.53	268.47	268.47	9.94	3273.76	327.24	327.24	12.58
25-34	839.27	206.73	206.73	4.51	876.42	678.58	677.53	4.85	1749.87	851.13	850.17	9.53
35-49	522.31	411.69	411.69	1.27	692.65	704.35	704.35	5.21	1216.18	1114.82	1114.82	6.44
15-49	2965.46	689.54	689.54	9.05	3203.61	1674.39	1673.34	19.91	6208.12	2324.88	2323.88	28.56
15+	3587.28	918.72	918.72	10.85	4338.12	2089.88	2088.72	21.95	7983.51	2950.49	2949.42	32.31

[1]Weighted number

Note: Mean duration recent infection (MDRI) = 130 days (95.0% CI: 118-142 days); proportion false recent (PFR) = 0.00; time cutoff (T) = 1 year

Detection of Antiretrovirals

To understand recent exposure to ARVs and hence level of ART coverage, samples from all confirmed HIV-positive participants were evaluated for the presence of selected ARVs, using high-resolution liquid chromatography coupled with tandem mass spectrometry to detect ARVs from DBS specimens.[2] Three ARVs, two non-nucleoside reverse transcriptase inhibitors, efavirenz and nevirapine, and one protease inhibitor, lopinavir, were used as markers for both first- and second-line regimens, based on Eswatini's national treatment guidelines. The ARVs were selected based on their long half-lives, allowing for a longer window period from drug exposure to detection.

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) (Phenomonex, 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 quality control cut-off samples including negative controls were utilized in each run. This qualitative method used a limit of detection of 0.02 microgram (µg)/mL for each ARV, with a signal-to-noise ratio of at least 5:1 for all ARVs. Samples with concentrations above 0.02 µg/mL were considered positive for each ARV. Testing was conducted at University of Cape Town in Cape Town, South Africa.

Genotyping for Detection of Antiretroviral Drug Resistance and HIV Subtyping

To determine the extent of transmitted HIV-1 drug resistance mutations among participants, samples from confirmed HIV-positive children aged less than 18 months and HIV-positive participants aged 18 months and older who were classified as recent infections as well as an equal or greater number of who were classified as long-term infections were evaluated using a TaqMan® SNP Genotyping Assay (Applied Biosystems) to identify mutations within the HIV-1 *pol* gene region, which encodes amino acid substitutions known to be responsible for resistance to specific ARVs.

Viral RNA or TNA from plasma or DBS was extracted using the NucliSENS® easyMAG® (bioMérieux, Marcy-L'Etoile, France) platform. The HIV *pol* gene was amplified by one-step RT-PCR, which was followed by nested PCR. Sequencing of the approximately one-kilobase amplicons was performed on the ABI 3730 DNA Analyzer (Applied Biosystems).[3,4,5]

The customized ReCALL software program was used to edit raw sequences and generate consensus sequences.[6] Mutations in the protease and reverse transcriptase genes were classified as potentially associated with drug resistance, according to the Stanford University HIV Drug Resistance Database.[7] Sequences with greater than 98.0% homology were flagged for potential cross-contamination or possible epidemiological links. Internal quality assurance measures and in-house quality control standards were included in each run, to validate results. The assay's sensitivity has been established at 1000 copies/mL for plasma and DBS.[8] Sequences were also analyzed for potential cross-contamination by phylogenetic analysis from code 6 of the protease gene to code 251 of the reverse transcriptase gene.

Subtyping of each sample was performed using the REGA HIV-1 & 2 Automated Subtyping Tool.[9,10] This BioAfrica viral subtyping tool is designed to use phylogenetic methods in order to identify the HIV-1 subtype of a specific sequence. The sequence is analyzed for recombination using boot-scanning methods.

B.4 References

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APPENDIX C ESTIMATES OF SAMPLING ERRORS

Estimates from sample surveys are affected by two types of errors: non-sampling errors and sampling errors. Non-sampling errors result from mistakes made during data collection (e.g., misinterpretation of an HIV test result) and data management (e.g., transcription errors in data entry). While SHIMS2 implemented numerous quality assurance and control measures to minimize non-sampling 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 SHIMS2 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 (e.g., 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.

SHIMS2 utilized a multistage stratified sample design, which requires complex calculations to obtain sampling errors. Specifically, a variant of the jackknife replication method was implemented in SAS to estimate variance for proportions (e.g., HIV prevalence), rates (e.g., annual HIV incidence), and counts (e.g., numbers of people living with HIV). Each replication considers all but one cluster in the calculation of the estimates. Pseudo-independent replications are thus created. In SHIMS2, a jackknife replicate is created by randomly deleting one cluster from each variance-estimation stratum and retaining all of the clusters in the remaining strata. A total of 250 variance-estimation strata were created by pairing (or occasionally tripling) the sample clusters in the systematic order in which they had been selected. Hence, 250 replications were created. The variance of a sample-based statistic, y, is calculated as follows:

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

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

In addition to the standard error, the design effect for each estimate is also calculated. The design effect is defined as the ratio of the standard error using the given sample design to the standard error 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 sampling error due to the use of a more complex and less statistically efficient design. Confidence limits for the estimates, which are calculated as:

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

where $t(0.975; K)$ is the 97.5th percentile of a *t*-distribution with *K* degrees of freedom, are also computed.

Sampling errors for selected variables from SHIMS2 are presented in Tables C.1 through C.8, and sampling errors for all survey estimates may be found online at the PHIA Project 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, among adults 15 years and older, SHIMS2 2016-2017

Age (years)	Weighted estimate (%)	Design effect	Lower confidence limit (%)	Upper confidence limit (%)
		TOTAL		
15-24	1.31	0.97	0.66	1.96
25-34	1.65	1.32	0.65	2.65
35-49	1.65	1.01	0.44	2.85
15-49	1.48	1.12	0.96	1.99
15+	1.36	0.95	0.92	1.80
		MEN		
15-24	0.79	1.04	0.08	1.49
25-34	1.50	1.33	0.12	2.85
35-49	0.68	0.89	0.00	1.85
15-49	0.99	1.25	0.39	1.59
15+	1.02	0.72	0.47	1.57
		WOMEN		
15-24	1.87	1.05	0.79	2.95
25-34	1.84	1.23	0.34	3.32
35-49	2.40	1.04	0.48	4.29
15-49	1.99	1.19	1.16	2.80
15+	1.70	1.27	1.04	2.35

Table C.2	**Sampling errors: HIV prevalence by age, SHIMS2 2016-2017**				
Age	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
			TOTAL		
0-17 months	4.2	266	1.5	1.2	7.2
18-59 months	0.8	765	0.3	0.1	1.4
5-9	2.9	1,187	0.5	1.8	4.0
10-14	4.1	1,154	0.6	2.9	5.2
Total 0-4	1.7	1,031	0.5	0.7	2.7
Total 0-14	2.8	3,372	0.3	2.2	3.4
15-19	5.6	2,059	0.5	4.4	6.7
20-24	12.8	1,542	0.9	11.0	14.6
25-29	26.1	1,383	1.5	23.0	29.1
30-34	40.8	1,218	1.4	37.9	43.6
35-39	49.1	978	2.3	44.4	53.8
40-44	48.4	722	2.6	43.2	53.7
45-49	44.9	631	1.9	41.0	48.9
50-54	38.5	552	2.3	33.7	43.3
55-59	30.5	474	2.2	26.0	35.0
60-64	26.8	457	2.1	22.5	31.1
65+	10.9	918	1.1	8.6	13.3
Total 15-24	9.1	3,601	0.5	8.0	10.2
Total 15-49	27.2	8,533	0.7	25.8	28.7
Total 15+	27.0	10,934	0.6	25.7	28.3
			MEN		
0-17 months	4.3	142	1.8	0.7	8.0
18-59 months	0.5	377	0.4	0.0	1.2
5-9	3.1	587	0.8	1.4	4.8
10-14	4.7	576	0.9	2.8	6.5
Total 0-4	1.6	519	0.6	0.3	2.9
Total 0-14	3.0	1,682	0.5	2.1	4.0
15-19	3.9	1,028	0.7	2.5	5.4
20-24	4.2	647	0.8	2.5	6.0
25-29	13.3	572	1.5	10.2	16.4
30-34	28.1	474	2.3	23.4	32.9
35-39	41.9	410	2.9	35.9	47.9
40-44	43.3	292	3.4	36.4	50.2
45-49	48.8	232	3.5	41.5	56.1
50-54	41.9	192	4.1	33.5	50.3

Table C.2	Sampling errors: HIV prevalence by age, SHIMS2 2016-2017 (continued)				
Age	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
			MEN (continued)		
55-59	31.8	176	3.2	25.2	38.4
60-64	31.9	163	3.7	24.3	39.5
65+	14.9	320	1.9	10.9	19.0
Total 15-24	4.1	1,675	0.5	2.9	5.2
Total 15-49	18.9	3,655	0.8	17.3	20.4
Total 15+	20.4	4,506	0.7	18.9	21.9
			WOMEN		
0-17 months	4.0	124	2.1	0.0	8.3
18-59 months	1.0	388	0.5	0.0	2.1
5-9	2.7	600	0.8	1.1	4.2
10-14	3.4	578	0.8	1.8	5.1
Total 0-4	1.8	512	0.6	0.5	3.1
Total 0-14	2.6	1,690	0.4	1.8	3.4
15-19	7.2	1,031	0.9	5.4	9.0
20-24	20.9	895	1.5	17.8	24.0
25-29	37.5	811	2.0	33.4	41.5
30-34	50.7	744	2.0	46.5	54.9
35-39	54.2	568	2.8	48.5	60.0
40-44	51.9	430	3.2	45.4	58.5
45-49	42.3	399	2.4	37.4	47.2
50-54	36.1	360	2.7	30.6	41.6
55-59	29.5	298	3.0	23.3	35.8
60-64	22.3	294	2.5	17.2	27.3
65+	7.4	598	1.2	5.0	9.8
Total 15-24	13.9	1,926	0.9	12.1	15.8
Total 15-49	34.3	4,878	0.8	32.6	36.0
Total 15+	32.5	6,428	0.7	31.0	34.0

Table C.3	Sampling errors: HIV prevalence by residence and region, among adults aged 15 years and older, SHIMS2 2016-2017				
Characteristic	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
TOTAL					
Residence					
Urban	29.8	2265	2.1	25.5	34.0
Rural	26	8669	0.6	24.8	27.2
Region					
Hhohho	25.7	3,284	1.2	23.2	28.2
Lubombo	29.4	2,253	1.3	26.7	32.1
Manzini	27.3	3,405	1.5	24.3	30.3
Shiselweni	25.9	1,992	1.2	23.6	28.3
MEN					
Residence					
Urban	23.5	970	2.3	18.7	28.2
Rural	19.3	3,536	0.7	17.9	20.7
Region					
Hhohho	19.7	1,402	1.2	17.2	22.2
Lubombo	23.5	971	1.6	20.1	26.8
Manzini	20.7	1,360	1.8	17.0	24.4
Shiselweni	17.1	773	1.0	15.0	19.2
WOMEN					
Residence					
Urban	34.9	1,295	2.2	30.5	39.4
Rural	31.6	5,133	0.7	30.1	33.1
Region					
Hhohho	31.0	1,882	1.6	27.8	34.2
Lubombo	34.9	1,282	1.7	31.4	38.3
Manzini	32.4	2,045	1.4	29.4	35.3
Shiselweni	32.8	1,219	1.6	29.5	36.1

Table C.4	Sampling errors: Viral load suppression by age, SHIMS2 2016-2017				
Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
			TOTAL		
0–14	61.3	96	5.3	50.4	72.2
15–24	50.6	338	2.6	45.2	55.9
25–34	68.4	933	1.9	64.6	72.2
35–44	78.3	860	1.5	75.1	81.5
45–54	80.8	511	1.9	76.8	84.8
55-64	88.3	269	1.9	84.3	92.3
65+	85.5	92	4.4	76.5	94.6
Total 15-24	50.6	338	2.6	45.2	55.9
Total 15-49	70.8	2,423	1.0	68.8	72.9
Total 15+	73.1	3,003	0.9	71.3	75.0
			MEN		
0–14	58.3	52	6.9	44.2	72.4
15–24	32.9	69	5.5	21.5	44.3
25–34	54.8	220	3.5	47.6	62.1
35–44	69.2	317	2.8	63.3	75.0
45–54	80.0	207	3.0	73.9	86.1
55-64	89.3	111	3.2	82.8	95.9
65+	84.9	48	6.1	72.4	97.5
Total 15-24	32.9	69	5.5	21.5	44.3
Total 15-49	62.3	729	1.8	58.7	65.9
Total 15+	67.6	972	1.5	64.5	70.6
			WOMEN		
0–14	64.9	44	8.1	48.2	81.7
15–24	55.5	269	2.9	49.5	61.5
25–34	73.5	713	2.2	69.0	78.1
35–44	83.4	543	1.7	79.9	86.8
45–54	81.5	304	2.4	76.5	86.4
55-64	87.3	158	2.4	82.3	92.3
65+	86.6	44	4.9	76.5	96.8
Total 15-24	55.5	269	2.9	49.5	61.5
Total 15-49	74.8	1,694	1.2	72.3	77.3
Total 15+	76.0	2,031	1.1	73.8	78.2

Table C.5	Sampling errors: Viral load suppression by residence and region, among adults aged 15 years and older, SHIMS2 2016-2017				
Characteristic	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
TOTAL					
Residence					
Urban	70.4	725	1.9	66.6	74.2
Rural	74.3	2,278	1.0	72.2	76.3
Region					
Hhohho	72.1	874	1.7	68.5	75.7
Lubombo	72.6	672	1.9	68.7	76.5
Manzini	71.5	931	1.6	68.2	74.7
Shiselweni	79.1	526	1.6	75.8	82.5
MEN					
Residence					
Urban	62.1	257	2.6	56.8	67.4
Rural	70.0	715	1.8	66.2	73.8
Region					
Hhohho	65.6	295	3.0	59.4	71.9
Lubombo	68.2	240	3.3	61.4	75.0
Manzini	65.7	292	2.4	60.6	70.7
Shiselweni	75.9	145	3.8	68.0	83.9
WOMEN					
Residence					
Urban	75.0	468	2.3	70.3	79.6
Rural	76.5	1,563	1.2	74.0	78.9
Region					
Hhohho	75.8	579	2.1	71.6	80.1
Lubombo	75.4	432	2.3	70.6	80.2
Manzini	74.4	639	2.0	70.3	78.5
Shiselweni	80.4	381	2.0	76.3	84.5

Table C.6 Sampling errors: ARV-adjusted 90-90-90 by age (conditional percentages), among adults aged 15 years and older, SHIMS2 2016-2017

Age (years)	Diagnosed					On Treatment					Viral Load Suppression				
	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
							TOTAL								
15-24	72.1	336	2.8	66.4	77.8	85.3	248	2.4	80.3	90.3	76.5	214	3.0	70.4	82.7
25-34	85.0	930	1.4	82.1	87.9	85.2	807	1.4	82.3	88.2	89.9	690	1.2	87.3	92.4
35-49	90.9	1,151	0.9	89.1	92.7	90.2	1,058	1.0	88.1	92.3	93.5	954	0.7	92.0	95.0
15-49	86.1	2,417	0.7	84.7	87.6	87.8	2,113	0.9	86.0	89.6	90.3	1,858	0.6	89.0	91.6
15+	87.0	2,997	0.6	85.7	88.3	88.8	2,651	0.8	87.2	90.4	91.4	2,369	0.5	90.3	92.5
							MEN								
15-24	60.3	68	6.4	47.2	73.5	92.2	44	5.9	80.1	100.0	57.6	41	7.5	42.0	73.1
25-34	69.2	220	3.5	62.0	76.4	84.3	156	3.3	77.4	91.1	85.0	133	3.4	78.0	92.0
35-49	84.8	439	1.7	81.3	88.3	89.9	381	1.7	86.4	93.4	92.4	342	1.4	89.6	95.2
15-49	77.3	727	1.6	74.0	80.6	88.4	581	1.6	85.2	91.6	87.6	516	1.6	84.4	90.9
15+	80.1	970	1.3	77.4	82.8	90.2	800	1.2	87.8	92.7	90.5	728	1.2	88.1	93.0
							WOMEN								
15-24	75.5	268	2.8	69.7	81.2	83.7	204	2.5	78.6	88.9	81.2	173	3.2	74.6	87.9
25-34	91.1	710	1.2	88.5	93.6	85.5	651	1.6	82.2	88.8	91.2	557	1.4	88.4	94.1
35-49	94.6	712	0.9	92.8	96.4	90.4	677	1.3	87.7	93.1	94.1	612	0.9	92.3	95.9
15-49	90.2	1,690	0.8	88.6	91.8	87.5	1,532	1.0	85.4	89.6	91.4	1,342	0.7	89.9	92.8
15+	90.7	2,027	0.7	89.2	92.1	88.1	1,851	0.9	86.3	90.0	91.8	1,641	0.6	90.4	93.1

ARV: antiretroviral

Table C.7 Sampling errors: ARV-adjusted 90-90-90 by age (unconditional percentages), among adults aged 15 years and older, SHIMS2 2016-2017

Age (years)	Diagnosed					On Treatment					Viral Load Suppression				
	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
								TOTAL							
15-24	72.1	336	2.8	66.4	77.8	61.5	336	3.0	55.3	67.7	47.1	336	2.9	41.2	53.0
25-34	85.0	930	1.4	82.1	87.9	72.5	930	1.8	68.8	76.1	65.1	930	1.9	61.1	69.1
35-49	90.9	1,151	0.9	89.1	92.7	82.0	1,151	1.3	79.3	84.6	76.6	1,151	1.3	73.9	79.4
15-49	86.1	2,417	0.7	84.7	87.6	75.6	2,417	1.0	73.6	77.5	68.2	2,417	1.0	66.1	70.4
15+	87.0	2,997	0.6	85.7	88.3	77.3	2,997	0.8	75.6	79.0	70.6	2,997	0.9	68.8	72.5
								MEN							
15-24	60.3	68	6.4	47.2	73.5	55.6	68	6.7	41.9	69.4	32.0	68	5.5	20.7	43.4
25-34	69.2	220	3.5	62.0	76.4	58.3	220	3.5	51.1	65.5	49.6	220	3.7	42.0	57.2
35-49	84.8	439	1.7	81.3	88.3	76.2	439	2.0	72.0	80.4	70.4	439	2.1	66.0	74.9
15-49	77.3	727	1.6	74.0	80.6	68.3	727	1.8	64.7	72.0	59.9	727	1.9	56.1	63.7
15+	80.1	970	1.3	77.4	82.8	72.3	970	1.5	69.2	75.3	65.4	970	1.6	62.2	68.6
								WOMEN							
15-24	75.5	268	2.8	69.7	81.2	63.2	268	3.1	56.8	69.6	51.3	268	3.3	44.6	58.1
25-34	91.1	710	1.2	88.5	93.6	77.9	710	1.8	74.2	81.5	71.1	710	2.1	66.8	75.3
35-49	94.6	712	0.9	92.8	96.4	85.5	712	1.5	82.4	88.5	80.4	712	1.6	77.1	83.7
15-49	90.2	1,690	0.8	88.6	91.8	78.9	1,690	1.0	76.8	81.1	72.1	1,690	1.2	69.7	74.5
15+	90.7	2,027	0.7	89.2	92.1	79.9	2,027	0.9	78.1	81.8	73.3	2,027	1.0	71.2	75.4

ARV: antiretroviral

Table C.8	Sampling errors: Number of new infections annually and number of people living with HIV, among adults aged 15 years and older, SHIMS2 2016-2017			
	Weighted estimate	Standard error	Lower confidence limit	Upper confidence limit
Number of new infections annually (using LAg/VL algorithm)	7,255	1,150	4,881	9,629
Number of new infections annually (using LAg/VL/ARVs algorithm)	6,015	1,041	3,866	8,163
Number of people living with HIV	196,645	4,621	187,128	206,162

LAg: limiting antigen; VL: viral load; ARV: antiretroviral

APPENDIX D SURVEY PERSONNEL

Ministry of Health
Babazile Shongwe
Bongani Sigudla
Lenhle Dube
Lindiwe Cebe
Maqhawe Magongo
Mfundi Motsa
Nhlanhla Nhlabatsi
Nobuhle Mthethwa
Nokuthula Mahlalela
Nomthandazo Lukhele
Nozipho Motsa
Ntombi Ginindza
Pasipamire Munyaradzi
Phumzile Mndzebele
Rejoice Nkambule
Simangele Masilela
Temahlubi Dlamini
Thembi Dlamini
Trevor Sithole
Velephi Okello
Voyivoyi Lukhele
Vusie Lokotfwako
Xolisile Dlamini
Zandile Mnisi

CSO
Amos Zwane
Choice Ginindza
Fortune Mhlanga
Nelson Isidoro
Robert Fakudze
Ronald Malangwane
Thoko Nhlabatsi

UNICEF
Boniswa Dladla

UNAIDS
Pepukai Chikukwa

NERCHA
Khanya Mabuza
Tengetile Dlamini

ICAP in Swaziland
Clinton Simelane
Dennis Mudoni
Felix Kayigamba
Fortune Ndlovu
Gcinekile Dlamini
Harriet Nuwagaba-Biribonwoha
Mduduzi Hlophe
Mxolisi Dlamini
Nontobeko Gwebu
Nozipho Ndlovu
Pido Bongomin
Qiniso Sibiya
Ruben Sahabo
Sean Burke
Veli Madau
Zanele Vilakati

EGPAF
Caspian Chouraya

URC
Marianne Calnan

MSF
Bernard Kerschberger

CHAI
Khudzie Mlambo

PSI
Phelele Fakudze
Mandhla Mehlo

Pact
Daisy Kesyombe

Baylor
Sarah Perry

CDC Eswatini
Chiara Draghi
Caroline Ryan
Sikhathele Mazibuko
Trong Ao

CDC Atlanta
Bharat Parekh
Carin Molchan
Carole Moore
Daniel Williams
Drew Voetsch
Hetal Patel
Katina Pappas-Deluca
Katrina Sleeman
Kristin Brown
Laura Porter
Linda Fleming
Melissa Cates
Nikhil Kothegal
Paul Stupp
Stephen McCracken
Steven Kinchen
Trudy Dobbs
William Levine
Wolfgang Hladik

ICAP in New York
Andrea Low
Chelsea Solmo
David Hoos
Elizabeth Radin
Hannah Chung
Jessica Justman
Joseph Elias
Katherine Johnson
Kiwon Lee
Melissa Metz

Neena Philip
Sally Findley
Stephen Delgado
Suzue Saito
Theo Smart
Yen Pottinger

ICAP in South Africa
Belete Tegbaru Erkyhun
Blanche Pitt
Bright Phiri
Charles Wentzel
Herbert Longwe
Oliver Murangandi
Pule Mphohle
Takura Kupamupindi
Yvonne Mavengere

EHLS
Gugu Maphalala
Sindisiwe Dlamini
Nomcebo Phungwayo

WHO
Sithembile Ngeketo

SWANEPHA
Gavin Khumalo

Laboratory Team Eswatini
Nothando Nkambule
Samkelisiwe Simelane
Nombulelo Vilakati
Thandeka Tfwala
Nqobile Sikhondze
Namile Ndlovu
Nonsindiso Dlamini
Qiniso Dlamini
Phiwayinkhosi Dlamini
Nkosisikelela Mdluli
Zwelakhe Dlamini
Thabiso Mkhonta
Nokubonga Dlamini
Nondumiso Shongwe
Celani Gwebu
Sabelo Vilakati

Field Teams
Andile Dlamini
Bakhonzile Dludlu
Bongekile Khumalo
Bongiwe Janet Dlamini
Bongiwe Simelane
Buyisile Makhanya
Calile Mamba
Cebile Motsa
Cebsile Mkhonta
Colile Shongwe
Cynthia Msibi
Dudu Shongwe
Dumsile Dube
Dumsile Thwala
Faith Dlamini
Fikile Simelane
Fortunate Magagula
Gcebile Dlamini
Gcinaphi Shabangu
Glen Shoulder
Gugu Ntshangase
Happy Mnisi
Hlengiwe Matsenjwa
Linda Dlamini
Lomagugu Dlamini
Lomakhosi Dlamini
Maphangisa Dlamini
Mayibongwe Nkhoma
Mbali Shingube
Mbali Sifundza
Michael Dlamini
Mpendulo Magongo
Ncamsile Shongwe
Ncobile Mkhatshwa
Ndumiso Simelane
Nelisiwe Msibi
Nkosingiphile Manana
Nokuphila Dlamini
Nokuthula Khumalo
Nokwanda Dube
Nokwanda Lokotfwako
Nomathemba Shongwe
Nomcebo Masimula
Nomcebo Ngwenya
Nomkhosi Magagula
Nomvula Ndzabandzaba
Nondumiso Mngomezulu
Nonhlanhla Cele
Nontstselelo Bhembe
Nothando Hlophe
Nothando Motsa
Ntombenhle Malangwane
Ntombikayise Vilakati
Ntombiyelanga Mthimkhulu
Penelope Banda
Phetsile Motsa
Philile Dlamini
Philile Ndzimandze
Phumelele Nkonyane
Phumlani Gwebu
Phumzile Msibi
Sehlule Moyo
Sekwanele Kunene
Selby Mkhwanazi
Seluliwe Ndlangamandla
Sikhanyiso Masuku
Simanga Magongo
Simangele Methula
Simangele Zwane
Simphiwe Nkonyane
Sindela Dlamini
Sindie Shongwe
Siphesihle Zwane
Sizwe Hlatshwayo
Sphesihle Nxumalo
Tebenguni Nxumalo
Tekugcina Khumalo
Temdzabu Dlamini
Thandeka Mahlalela
Thandeka Thwala
Themba Shabangu
Thembi Simelane
Thokozani Maseko
Tholakele Gamedze
Thulile Makhubu
Victoria Bauleni
Wandile Machado
Wandile Mamba
Welile Gumbi
Welile Langa
Wendy Khumalo
Wendy Mahlalela
Winile Dlamini
Witness Masaiti
Xolile Dlamini

Xolisile Dlamini
Yenziwe Simelane
Zandile Hlophe
Zanele Mahlalela
Zenani Mavuso
Zethu Sithebe
Zodwa Mavuso
Zwakele Dlamini
Zwile Nxumalo

Final Report Workshop Contributors

Altaye Kidane
Anthony Mutiti
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Cebisile Ngcamphalala
Chris Makwindi
Julia Benjamin
Joyce Mphaya
Khanyisile Ntshalintshali
Lucky Mngometulu
Makhosazana Dlamini
Mandzisi Mkhontfo
Muhle Dlamini
Mpumelelo Mavimbela
Mpumelelo Ndlangamandla
Nhlanhla Magagula
Nicholas Kisyeri
Nsindiso Dlamini
Sebentile Myeni
Simangele Mthethwa-Hleta
Tengetile Dlamini
Thulani Maphosa
Zandile Nhleko

APPENDIX E HOUSEHOLD QUESTIONNAIRE

ENGLISH CONFIDENTIAL	MINISTRY OF HEALTH SWAZILAND HIV INCIDENCE MEASUREMENT SURVEY (SHIMS2 2016-2017) HOUSEHOLD QUESTIONNAIRE	TICK IF HOUSEHOLD SELECTED FOR CHILDREN'S SURVEY ☐

HOUSEHOLD IDENTIFICATION

[THIS PAGE AUTOPOPULATED WITH HOUSEHOLD LISTING INFORMATION]

REGION NAME: _____

INKHUNDLA NAME: _____

CHIEFDOM NAME: _____

NAME OF HOUSEHOLD HEAD: _____

REGION CODE ☐☐

IINKUNDLA CODE ☐☐

CHIEFDOM NUMBER ☐☐

HH NUMBER ☐☐

TOTAL PERSONS IN HOUSEHOLD	TOTAL ELIGIBLE WOMEN:	TOTAL ELIGIBLE MEN:	TOTAL ELIGIBLE CHILDREN:	LINE NO. OF RESPONDENT TO HOUSEHOLD QUESTIONNAIRE
☐☐	☐☐	☐☐	☐☐	☐☐

LANGUAGE OF INTERVIEW: ☐☐

NATIVE LANGUAGE OF RESPONDENT: ☐☐

TRANSLATOR USED? (Y/N) ☐

LANGUAGE CODES:
(01) ENGLISH
(02) SISWATI

SUPERVISOR: _____

DATE OF COMPLETING QUESTIONNAIRE: _____

SUPERVISOR CODE: ☐☐☐☐

OFFICE EDITOR: ☐☐

KEYED BY: ☐☐

* RESULTS CODES:
(1) COMPLETED
(2) NO HOUSEHOLD MEMBER AT HOME OR NO COMPETENT RESPONDENT AT HOME AT TIME OF VISIT
(3) ENTIRE HOUSEHOLD ABSENT FOR EXTENDED PERIOD OF TIME
(4) POSTPONED
(5) REFUSED
(6) DWELLING VACANT OR ADDRESS NOT A DWELLING
(7) DWELLING DESTROYED
(8) DWELLING NOT FOUND
(9) PARTLY COMPLETED
(96) OTHER (SPECIFY)

START TIME

START	Look at the time on the tablet in the right top corner and record the start time. USE 24-HOUR TIME. IF START TIME IS 3:12 PM, RECORD 15 HOURS, 12 MINUTES, NOT 03 HOURS, 12 MINUTES.	HOUR: MINUTES: ☐☐	

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 1: HOUSEHOLD ROSTER						
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."						
1		Add a new "HH MEMBER" group?	Do not add	1	if item = 1	item 11
2	personid	Name [INSERT SERIAL NUMBER]		text		
3	relattohh*	What is the relationship of [HHRNAME*] to the head of the household?	HEAD WIFE/HUSBAND / PARTNER BIOLOGICAL SON OR DAUGHTER SON-IN-LAW / DAUGHTER-IN-LAW GRANDCHILD PARENT PARENT-IN-LAW BROTHER/SISTER CO-WIFE OTHER RELATIVE ADOPTED/FOSTER/STEPCHILD NOT RELATED DON'T KNOW	1 2 3 4 5 6 7 8 9 10 11 12 -8		
4	householdhead gender*	Is [HHRNAME*] male or female?	MALE FEMALE	1 2		
5	livehere*	Does [HHRNAME*] usually live here?	YES NO	1 2		
6	sleephere*	Did [HHRNAME*] sleep here last night?	YES NO	1 2		
7	age*	How old is [HHRNAME*] in years? IF [HHRNAME*] IS LESS THAN 1 YEAR OLD, KEY 0 HERE AND KEY AGE IN MONTHS ON NEXT SCREEN.	AGE IN YEARS	integer	if age >=1 & age <=5 if age >5 & age <12 if age >=12 & age <18 if age <1 if age >=18	item 9 HHRSCHLHL* empancipated* agem hhrschlhl*
8	agem*	How old is [HHRNAME*] in months?	AGE IN MONTHS	integer	ALL	hhrschlhl*
9		You said that [HHRNAME*] was [age*]. How many months over [age*] is [HHRNAME*]?	MONTHS OVER	integer	ALL	hhrschlhl*
10	emancipated*	Is [HHRNAME*] a child with special circumstances? A child with special circumstances is a child 12-17 years of age who is married or has a child of their own and is not currently living with parents, or a child who is the decision maker in a household where there is no identified adult head of household.	YES NO	1 2		hhrschlhl*
11	hhrschlhl*	What was the highest level of school completed by [HHRNAME*]?	NEVER COMPLETED ANY KINDERGARTEN/ NURSERY PRIMARY SECONDARY HIGH SCHOOL TERTIARY DON'T KNOW REFUSED	0 1 2 3 4 5 -8 -9		
12	hhr12moaway*	In the last 12 months, was [HHRNAME*] away from home for more than one month at a time?	YES NO DON'T KNOW REFUSED	1 2 -8 -9	if age*>=0 & age*<18 if age*>=18	item 1 sick3mo*

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
13	sick3mo*	Has [HHRNAME*] been very sick for at least 3 months during the past 12 months, that is [HHQNAME*] was too sick to work or do normal activities?	YES	1		
			NO	2		
			DON'T KNOW	-8		
Interviewer says: "Thank you for completing the Household Roster. The next step will be to ask some confirmation questions."						
14		Just to make sure I have complete listing, are there any other persons such as small children or infants that we have not listed? IF NEW PERSONS ARE IDENTIFIED, SWIPE BACK TO THE ROSTER AND ADD THOSE NEW PEOPLE.				
15		Are there any other people who may not be members of your household such as domestic servants, lodgers, or friends who usually live here? IF NEW PERSONS ARE IDENTIFIED, SWIPE BACK TO THE ROSTER AND ADD THOSE NEW PEOPLE.				
16		Are there any guests or temporary visitors staying here, or anyone else who stayed here last night who we have not seen? IF NEW PERSONS ARE IDENTIFIED, SWIPE BACK TO THE ROSTER AND ADD THOSE NEW PEOPLE.				
Interviewer says: "Thank you for confirming the Household Roster is complete. The next step will be to answer some additional questions for the Household Members who are 0-17 years old."						
17		CONTINUE TO THE NEXT ITEM?	YES	1	if item = 2	**HH REFUSAL OR WITHDRAWAL FORM**
		SELECT 'NO' ONLY IF THE PARTICIPANT HAS EXPRESSED HE/SHE DOES NOT WISH TO CONTINUE ON WITH THE SURVEY.	NO	2		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 2: HOUSEHOLD ROSTER (FOR MINORS)					**if emancipated* =1 OR age >= 18**	
		These questions are regarding [HHRNAME*]				
18	momalive*	Is [HHRNAME*]'s natural mother alive?	YES NO DON'T KNOW	1 2 -8	if momalive*=2,-8	FEMGUARDHHM*
19	momhhm*	Does [HHRNAME*] 's natural mother usually live in this household or was a guest last night?	YES NO	1 2	if momhhm*=2	femguardhhm*
20	momfemname*	PLEASE SELECT [HHRNAME*]'S NATURAL MOTHER FROM THE LIST OF HOUSEHOLD MEMBERS BELOW.	[LIST OF ALL FEMALES FROM HOUSEHOLD]	list		
21	femguardhhm*	Does [HHRNAME*] have a female guardian who usually lives in this household or was a guest last night?	YES NO	1 2	if femguardhhm*=2	dadalive*
22	momfemname*	PLEASE SELECT [HHRNAME*]'S FEMALE GUARDIAN FROM THE LIST OF HOUSEHOLD MEMBERS BELOW.	[LIST OF ALL FEMALES FROM HOUSEHOLD]	list		
23	dadalive*	Is [HHRNAME*]'s natural father alive?	YES NO DON'T KNOW	1 2 -8	if dadalive*=2,-8	maleguardhhm*
24	dadhhm*	Does [HHRNAME*] 's natural father usually live in this household or was a guest last night?	YES NO	1 2	if dadhhm*=2	maleguardhhm*
25	dadmalename*	PLEASE SELECT [HHRNAME*]'S NATURAL FATHER FROM THE LIST OF HOUSEHOLD MEMBERS BELOW.	[LIST OF ALL MALES FROM HOUSEHOLD]	list		
26	maleguardhhm*	Does [HHRNAME*] have a male guardian who usually lives in this household or was a guest last night?	YES NO	1 2	if maleguardhhm*=2	item 28
27	dadmalename*	PLEASE SELECT [HHRNAME*]'S MALE GUARDIAN FROM THE LIST OF HOUSEHOLD MEMBERS BELOW.	[LIST OF ALL MALES FROM HOUSEHOLD]	list		
28	parentguardqx	SELECT AN ELIGIBLE ADULT WHO WILL FILL OUT CHILDREN'S MODULE FOR [HHRNAME*]. THE CHILDREN'S MODULE WILL ASK QUESTIONS ABOUT [HHRNAME*] IN THE ADULT QUESTIONNAIRE. THE SELECTED ADULT SHOULD BE SOMEONE WHO KNOWS [HHRNAME*].	[LIST MALES AND FEMALES FROM HOUSEHOLD WITH 18<=HHRAGEY OR (HHRAGEY*<18 AND EMANCIPATED*=1)]	list	SKIP if age*>14	
29		SELECT AN ADULT WHO CAN PROVIDE CONSENT OR GIVE PERMISSION FOR [HHRNAME*] TO PARTICIPATE IN THE SURVEY.	[LIST MALES AND FEMALES FROM HOUSEHOLD WITH (HHRAGEY*>=18) OR (HHRAGEY*<18 AND EMANCIPATED*=1)]	list NONE	SKIP if age*>14 if item 28a ! = NONE if item 28a = NONE	 sick3mo* emancipated*
30		You said that there is no adult in the household who can provide consent or permission for [HHRNAME*]. Is this correct?	YES NO	1 2	if emancipated = 1	**END OF SURVEY FOR [HHRNAME*]**

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
Interviewer says: "Thank you for completing the questions regarding the Household members who are 0-[INSERT AGE OF LEGAL ADULTHOOD] years old. The next step will be to answer some additional questions regarding the men who live in the household."						
31	momsick*	Has [HHRNAME*]'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?	YES	1		
			NO	2		
			DON'T KNOW	-8		
32		Does [HHRNAME*]'s natural mother have HIV/AIDS?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
33	dadsick*	Has [HHRNAME*]'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?	YES	1		
			NO	2		
			DON'T KNOW	-8		
34		Does [HHRNAME*]'s natural father have HIV/AIDS?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
35		*CONTINUE TO THE NEXT ITEM?*	YES	1	if item=2	**HH REFUSAL OR WITHDRAWAL FORM**
		SELECT 'NO' ONLY IF THE PARTICIPANT HAS EXPRESSED HE/SHE DOES NOT WISH TO CONTINUE ON WITH THE SURVEY.	NO	2		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 3: HOUSEHOLD SPOUSES/LIVE-IN PARTNERS						
36		Does [HHRNAME*] have a spouse or co-habitating partner who usually lives in the household or was a guest last night?	YES	1	SKIP IF FEMALE	
			NO	2	if item = 2	item 35
37		How many spouses or co-habitating partners (those who usually live in the household or stayed here last night) does [HHRNAME*] have?	NUMBER OF PARTNERS	integer	SKIP IF FEMALE	
38		*SELECT [HHRNAME*]'S [# SPOUSE] OR PARTNER FROM THE LIST BELOW*	[LIST OF ALL ADULTS AND EMANCIPATED MINORS FROM HOUSEHOLD]	list	SKIP IF FEMALE	
Interviewer says: "Thank you for completing the questions for the household's men. The next step will be to complete some additional questions for the women of the household."						
39		Does [HHRNAME*] have a spouse or co-habitating partner who usually lives in the household or was a guest last night?	YES	1	SKIP IF MALE	
			NO	2	if item = 2	item 38
40		*SELECT [HHRNAME*]'S [# SPOUSE] OR PARTNER FROM THE LIST BELOW*	[LIST OF ALL ADULTS AND EMANCIPATED MINORS FROM HOUSEHOLD]	list	SKIP IF MALE	
Interviewer says: "Thank you for completing the questions for the household's women. The next step will be to complete some additional questions regarding the household itself."						
41		*CONTINUE TO THE NEXT ITEM?*	YES	1	if item = 2	**HH REFUSAL OR WITHDRAWAL FORM**
		SELECT 'NO' ONLY IF THE PARTICIPANT HAS EXPRESSED HE/SHE DOES NOT WISH TO CONTINUE ON WITH THE SURVEY.	NO	2		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 4: ORPHANS AND VULNERABLE CHILDREN						
Interviewer says: "I would now 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. I will ask you about help you have received for each child."					if momsick*!=2,-8 OR dadsick*!=2,-8 OR momalive*!=1 OR dadalive*!=1 OR age*>=18	[NEXT MODULE]
42	supportmed12	Now I would like to ask you about the support your household received for [HHRNAME*]. In the last 12 months, has your household received any medical support for [HHRNAME*], such as medical care, supplies or medicine, for which you did not have to pay?	YES NO DON'T KNOW	1 2 -8		
43	supportemot12	In the last 12 months, has your household received any emotional or psychological support for [HHRNAME*], 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?	YES NO DON'T KNOW	1 2 -8	if supportemot12=2,-8	supportmater12
44	supportemot3	Did your household receive any of this emotional or psychological support for [HHRNAME*] in the past 3 months?	YES NO DON'T KNOW	1 2 -8		
45	supportmater12	In the last 12 months, has your household received any material support for [HHRNAME*], such as clothing, food, or financial support, for which you did not have to pay?	YES NO DON'T KNOW	1 2 -8	if supportmater12=2,-8	supportsocial12
46	supportmater3	Did your household receive any of this material support for [HHRNAME*] in the past 3 months?	YES NO DON'T KNOW	1 2 -8		
47	supportsocial12	In the last 12 months, has your household received any social support for [HHRNAME*] such as help in household work, training for a caregiver, or legal services, for which you did not have to pay?	YES NO DON'T KNOW	1 2 -8	if supportsocial12=2.-8	supportschol12
48	supportsocial3	Did your household receive any of this social support for [HHRNAME*] in the past 3 months?	YES NO DON'T KNOW	1 2 -8		
49	supportschol12	In the last 12 months, has your household received any support for [HHRNAME*]'s schooling, such as allowance, free admission, books, or supplies, for which you did not have to pay?	YES NO DON'T KNOW	1 2 -8		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 5: DEATHS IN THE HOUSEHOLD						
Interviewer says: "Now I would like to ask you some more questions about your household."						
50	deaths	Has any usual resident of your household died since January 1, 2014?	YES	1	if deaths=2, -8	[NEXT MODULE]
			NO	2		
			DON'T KNOW	-8		
51	deathcount	How many usual household residents died since January 1, 2014?	NUMBER OF DEATHS	integer	if deathcount=-8	[NEXT MODULE]
			DON'T KNOW	-8		
52		What was the name of the person who died (most recently/before him/her)?				
53	dieddatey1-4*	When did [HHQDTHNAM*] die? Please give your best guess.	YEAR	integer		
			DON'T KNOW YEAR	-8		
			REFUSED YEAR	-9		
	dieddatem1-4*		MONTH	integer		
			DON'T KNOW MONTH	-8		
			REFUSED MONTH	-9		
	dieddated1-4*		DAY	integer		
			DON'T KNOW DAY	-8		
			REFUSED DAY	-9		
54	diedgend1-4*	Was [HHQDTHNAM*] male or female?	MALE	1		
			FEMALE	2		
55	diedagey1-4*	How old was [HHQDTHNAM*] when (he/she) died?	YEARS	integer	if died1-4*!=0	[NEXT MODULE]
			DON'T KNOW	-8		
		ENTER '0' IF LESS THAN ONE YEAR	REFUSED	-9		
56	diedagem1-4*	How many months was [HHQDTHNAM*] when (he/she) died?	MONTHS			
			DON'T KNOW	-8		
			REFUSED	-9		
57	diedaged1-4*	How many days was [HHQDTHNAM*] when (he/she) died?	DAYS			
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 6: HOUSEHOLD ASSETS						
Interviewer says: "Now I would like to ask you more questions about your household."						
58	watersource	What is the main source of drinking water for members of your household?	PIPED INTO DWELLING	11	if watersource != 96	wtrsfr
			PIPED TO COMPOUND, YARD, OR PLOT	12		
			PUBLIC TAP/STANDPIPE	13		
			PIPED TO NEIGHBOUR	14		
			TUBE WELL OR BOREHOLE	21		
			PROTECTED WELL	31		
			UNPROTECTED WELL	32		
			PROTECTED SPRING	41		
			UNPROTECTED SPRING	42		
			RAINWATER COLLECTION	51		
			TANKER TRUCK	61		
			CART WITH SMALL TANK/DRUM	71		
			SURFACE WATER (RIVER, STREAM, DAM, LAKE, POND, CANAL, IRRIGATION CHANNEL)	81		
			OTHER (SPECIFY)	96		
59	wtrsfr	Do you do anything to the water to make it safer to drink?	YES	1	if wtrsfr=2,-8	hhq4wnwtn
			NO	2		
			DON'T KNOW	-8		
60	wtrtreat	What do you do to make your water safe for drinking?	BOIL	1		
		SELECT ONLY ONE RESPONSE.	USE WATER FILTER (CERAMIC, SAND, COMPOSITE, ETC.)	2		
			LET IT STAND AND SETTLE	3		
			ADD BLEACH/CHLORINE/CHLORINE-BASED TABLETS (WATER GUARD, AQUATAB)	4		
			STRAIN IT THROUGH A CLOTH	6		
			OTHER (SPECIFY)	96		
61	hhq4wnwtn	In the past four weeks, did your household go a whole day and night without water to meet your nutritional needs e.g. cooking or drinking?	YES	1	if hhq4wnwtn = 2, -8	hhq4wnwth
			NO	2		
			DON'T KNOW	-8		
62	hhq4wnwtnfrq	How often did this happen in the past 4 weeks?	RARELY (1-2 TIMES)	1		
			SOMETIMES (3-10 TIMES)	2		
			OFTEN (MORE THAN 10 TIMES)	3		
			DON'T KNOW	-8		
63	hhq4wnwth	In the past four weeks, did your household go a whole day and night without water to meet your hygiene needs e.g. bathing or washing utensils?	YES	1	if hhq4wnwth = 2, -8	toilettype
			NO	2		
			DON'T KNOW	-8		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
64	hhq4wnwthfrq	How often did this happen in the past 4 weeks?	RARELY (1-2 TIMES)	1		
			SOMETIMES (3-10 TIMES)	2		
			OFTEN (MORE THAN 10 TIMES)	3		
			DON'T KNOW	-8		
65	toilettype	What kind of toilet facility do members of your household usually use?	FLUSH TO PIPED SEWER SYSTEM	1	if toilettype=61	item 50
			FLUSH TO SEPTIC TANK	2	if toiletttype != 96	toiletshare
			FLUSH TO PIT (LATRINE)	3		
			FLUSH TO SOMEWHERE ELSE (SPECIFY)	4		
			VENTILATED IMPROVED PIT LATRINE (VIP)	22		
			PIT LATRINE WITH CONCRETE SLAB	23		
			PIT LATRINE WITHOUT CONCRETE	24		
			INCOMPLETE LATRINE	25		
			VIP LATRINE WITH HEALTH CARE WASTE COMPONENT	26		
			COMPOSTING TOILET	31		
			BUCKET	32		
			FLYING TOILET (PLASTIC)	33		
			NO FACILITY, BUSH, FIELD	61		
			OTHER (SPECIFY)	96		
66	toiletshare	Do you share this toilet facility with other households?	YES	1	if toiletshare = 2	item 50
			NO	2		
67	toiletsharenum	How many households use this facility?	NUMBER OF HOUSEHOLDS IF LESS THAN 10	integer		
			10 OR MORE HOUSEHOLDS	96		
			DON'T KNOW	-8		
68	havelec	Does your household have fuctional: READ ALL RESPONSES ALOUD. SELECT ALL THAT APPLY.	ELECTRICITY?	A		
	havrad		A RADIO?	B		
	havtele		A TELEVISION?	C		
	havmobl		A TELEPHONE/MOBILE TELEPHONE?	D		
	havfrig		A REFRIGERATOR?	E		
69	cookingfuel	What type of fuel does your household mainly use for cooking? SELECT ONLY ONE RESPONSE.	ELECTRICITY	1	if cookingfuel != 96	matfloor
			LIQUEFIED PETROLEUM GAS (LPG)	2		
			BIOGAS	3		
			PARAFFIN	4		
			COAL, LIGNITE	5		
			CHARCOAL	6		
			DUNG	8		
			WOOD	11		
			STRAW/SHRUBS/GRASS	12		
			AGRICULTURAL CROP RESIDUE	13		
			NO FOOD COOKED IN HOUSEHOLD	95		
			OTHER (SPECIFY)	96		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
70	matfloor	MAIN MATERIAL OF FLOOR. RECORD OBSERVATION.	EARTH/SAND DUNG WOOD PLANKS PALM/BAMBOO PARQUET OR POLISHED WOOD VINYL OR ASPHALT STRIP CERAMIC TILES CEMENT/TERAZO CARPET OTHER (SPECIFY)	11 12 21 22 31 32 33 34 35 96	if matfloor != 96	matroof
71	matroof	MAIN MATERIAL OF THE ROOF RECORD OBSERVATION.	NO ROOF THATCH/GRASS RUSTIC MAT WOOD PLANKS CARDBOARD CORRUGATED IRON WOOD CALAMINE/CEMENT FIBRE ASBESTOS CEMENT/ CONCRETE CERAMIC TILES OTHER (SPECIFY)	11 12 14 15 16 21 23 24 31 32 33 96	if matroof != 96	matexwalls
72	matexwalls	MAIN MATERIAL OF THE EXTERIOR WALLS RECORD OBSERVATION.	NO WALLS CANE/PALM/TRUNKS STICK & MUD GRASS BAMBOO WITH MUD STONE WITH MUD REUSED WOOD PLYWOOD (OFF CUTS) CARDBOARD/CARTONS CORRUGATED IRON CEMENT STONE WITH LIME/CEMENT BRICKS CEMENT BLOCKS WOOD PLANKS/SHINGLES OTHER (SPECIFY)	11 12 14 15 21 22 25 26 27 28 31 32 33 34 35 96	if matexwalls != 96	roomsleep
73	roomsleep	How many rooms are used for sleeping?	NUMBER OF ROOMS	integer		
74	ownbike ownmoto owncar ownboat owncows owngtsh ownplry ownanml	Does any member of your household own: READ ALL RESPONSES ALOUD. SELECT ALL THAT APPLY.	A BICYCLE? A MOTORCYCLE OR MOTOR SCOOTER? A CAR OR TRUCK? A BOAT WITH A MOTOR? COWS? GOATS/SHEEP? POULTRY (E.G. DUCKS, CHICKEN)? OTHER ANIMALS (CAMELS, HORSES, DONKEYS)?	A B C D E F G X		
75	mosnets	Does your household have any mosquito nets that can be used while sleeping?	YES NO DON'T KNOW	1 2 -8		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
76	nofood4wkyn	In the past 4 weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	YES	1	if nofood4wkyn=2,-8	hungry4wkyn
			NO	2		
			DON'T KNOW	-8		
77	nofood4wkfreq	How often did this happen in the past 4 weeks?	RARELY (1-2 TIMES)	1		
			SOMETIMES (3-10 TIMES)	2		
			OFTEN (MORE THAN 10 TIMES)	3		
78	hungry4wkyn	In the past 4 weeks, did you or any household member go to sleep at night hungry because there was not enough food?	YES	1	if hungry4wkyn=2,-8	noeat4wkyn
			NO	2		
			DON'T KNOW	-8		
79	hungry4wkfreq	How often did this happen in the past 4 weeks?	RARELY (1-2 TIMES)	1		
			SOMETIMES (3-10 TIMES)	2		
			OFTEN (MORE THAN 10 TIMES)	3		
80	noeat4wkyn	In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	YES	1	if noeat4wkyn=2,-8	[NEXT MODULE]
			NO	2		
			DON'T KNOW	-8		
81	noeat4wkfreq	How often did this happen in the past 4 weeks?	RARELY (1-2 TIMES)	1		
			SOMETIMES (3-10 TIMES)	2		
			OFTEN (MORE THAN 10 TIMES)	3		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 7: ECONOMIC SUPPORT						
Interviewer says: "Now I will ask you questions on the economic support you have received."						
82	econsup3	Has your household received any of the following forms of external economic support in the last 3 months?	NOTHING	A		
		READ THE RESPONSES ALOUD.	CASH TRANSFER (E.G. PENSIONS, DISABILITY GRANTS, CHILD GRANT)	B		
		SELECT ALL THAT APPLY.	ASSISTANCE FOR SCHOOL FEE	C		
			MATERIAL SUPPORT FOR EDUCATION (E.G. UNIFORMS, SCHOOL BOOKS, EDUCATION, TUITION SUPPORT, BURSARIES)	D		
			INCOME GENERATION SUPPORT IN CASH OR KIND (E.G. AGRIGULTURAL INPUTS)	E		
			FOOD ASSISTANCE PROVIDED AT THE HOUSEHOLD OR EXTERNAL INSTITUTION	F		
			MATERIAL OR FINANCIAL SUPPORT FOR SHELTER	G		
			SOCIAL PENSION	H		
			OTHER	X		
			DON'T KNOW	Z		
Interviewer says: "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?"						

INTERVIEWER OBSERVATIONS:
TO BE COMPLETED AFTER THE INTERVIEW:

COMMENTS ABOUT RESPONDENT:

_____

_____

COMMENTS ABOUT SPECIFIC QUESTIONS:

_____

_____

ITEMS FOR THE ATTENTION OF THE SUPERVISOR:

_____

_____

GENERAL QUESTIONS:

_____

_____

_____

APPENDIX F ADULT QUESTIONNAIRE

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 1: 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	gender	DO NOT READ: IS THE RESPONDENT MALE OR FEMALE?	MALE FEMALE	1 2		
102	schlat	Have you ever attended school?	YES NO DON'T KNOW REFUSED	1 2 -8 -9	IF schlat = 2,-8,-9	mont12away
103	schlcur	Are you enrolled in school?	YES NO DON'T KNOW REFUSED	1 2 -8 -9		
104	schlhi	What is the highest level of school or you attended: primary, secondary, higher?	PRIMARY SECONDARY HIGH SCHOOL TERTIARY DON'T KNOW REFUSED	1 2 3 4 -8 -9		
105	schcom	What is the highest grade/form that you have completed? MARK GRADE OR FORM, AS APPROPRIATE.	GRADE/FORM NURSERY/KINDERGARTEN GRADE FORM DON'T KNOW REFUSED	integer 0 1 2 -8 -9		
106	mont12away	In the last 12 months, how many times have you been away from home for one or more nights?	NUMBER OF TRIPS DON'T KNOW REFUSED	integer -8 -9	IF mont12away = 0, -8,-9	work12mo
107	mo12away	In the last 12 months, have you been away from home for more than one month at a time?	YES NO DON'T KNOW REFUSED	1 2 -8 -9		
108	work12mo	Have you done any work in the last 12 months for which you received a paycheck, cash or goods as payment?	YES NO DON'T KNOW REFUSED	1 2 -8 -9	IF work12mo=2,-8,-9	[NEXT MODULE]
109	work30days	Have you done any work in the last thirty days for which you received cash or goods as payment?	YES NO DON'T KNOW REFUSED	1 2 -8 -9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 2: MARRIAGE						
Interviewer says: "Now I would like to ask you about your current and previous relationships and/or marriages."						
201	evermar	Have you ever been married or lived together with a [man/woman] as if married?	YES NO DON'T KNOW REFUSED	1 2 -8 -9	IF evermar = 2, -8, -9	[NEXT MODULE]
202	curmar	What is your marital status now: are you married, living together with someone as if married, widowed, divorced, or separated?	MARRIED LIVING TOGETHER WIDOWED DIVORCED SEPARATED DON'T KNOW REFUSED	1 2 3 4 5 -8 -9	IF curmar = 3, 4, 5, -8, -9	[NEXT MODULE]
Interviewer says: "The next several questions are about your current spouse or partner(s)."						
					If gender is Female and partner linked in roster If gender is Female and no partner linked in roster	huslivew husotwif
203	numwif	Altogether, how many wives or partners do you have?	NUMBER OF WIVES OR PARTNERS DON'T KNOW REFUSED	integer -8 -9	If no linked partner in roster	npnyhstd
204	reviewwife	The Household Schedule listed [INSERT NUMBER OF REPORTED PARTNERS] household members as your wives/partners. Please review the list below. Are all of the listed household members your wives/partners who live in the household?	YES NO	1 2	IF reviewwife = 1	npyn
205		Is [HHRNAME**] your wife/partner?	YES NO	1 2	IF item = 2	npyn
206	livehere	Does [HHRNAME**] live in the household?	YES NO	1 2		
207	npyn	Do you have other wives/partner(s) that live with you in this household?	YES NO	1 2	IF npyn = 2	npnyhstd
208	npnum	How many other wives/partners(s) live with you in this household?	NUMBER OF WIVES OR PARTNERS DON'T KNOW REFUSED	integer -8 -9	IF npnum = -8, -9	npnyhstd
209		Please enter the name of your wife/partner that lives with you in this household.	 DON'T KNOW REFUSED	text -8 -9		
210	npnyhstd	Do you have other wives/partner(s) that live with you in this homestead	YES NO	1 2	IF npnyhstd = 2	wifliveew
211	npnumhstd	How many other wives/partners(s) live with you in this homestead?	YES DON'T KNOW REFUSED	integer -8 -9		
212	wifliveew	How many wives or live-in partners do you have who live outside this homestead?	 DON'T KNOW REFUSED	integer -8 -9	ALL	[NEXT MODULE]
213	huslivew	Is your husband or partner living with you now or is he staying elsewhere?	LIVING TOGETHER STAYING ELSEWHERE DON'T KNOW REFUSE TO ANSWER	1 2 -8 -9	IF huslivew = 2 and count of household roster list of husbands/partners = 0 IF huslivew = -8, -9 and no partner linked in roster	husotwif husotwif

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
214		The household schedule listed [NAME] as your husband/partner who is living here. Is that correct?	YES	1	IF item = 1, -8, -9	husotwif
			NO	2		
			DON'T KNOW	-8		
			REFUSE TO ANSWER	-9		
215	husid	Please select the husband/partner that lives with you.	[LIST OF PERSONS on HH ROSTER]		IF husid != 96	husotwif
			NOT LISTED IN HOUSEHOLD	96		
216		Please enter the name of your husband/partner that lives with you.		text		
			DON'T KNOW	-8		
			REFUSED	-9		
217	husotwif	Does your husband or partner have other wives or does he live with other women as if married?	YES	1	IF husotwif = 2, -8, -9	[NEXT MODULE]
			NO	2		
			DON'T KNOW	-8		
			REFUSE TO ANSWER	-9		
218	husnwif	Including yourself, in total, how many wives or live-in partners does your husband or partner have?	NUMBER OF WIVES OR LIVE-IN PARTNERS	integer		
			DON'T KNOW	-8		
			REFUSE TO ANSWER	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 3: REPRODUCTION					IF (gender* = 1)	item 342
Interviewer says: "Now I would like to ask you questions about your pregnancies and your children."						
301	pregnum	How many times have you been pregnant including a current pregnancy?	NUMBER OF TIME(S)	integer	-	-
		CODE '0' IF NONE.	DON'T KNOW	-8	IF pregnum = 0	item 342
			REFUSED	-9	IF pregnum = -8, -9	item 342
302	liveb	Have you ever had a pregnancy that resulted in a live birth?	YES	1	IF liveb = 2, -8, -9	item 342
		A live birth is when the baby shows signs of life, such as breathing, beating of the heart or movement.	NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
303	childa2012	How many live births have you had since the 1st of January, 2013?	NUMBER OF LIVE BIRTHS	integer	IF childa2012 = 0, -8, -9	item 342
		DO NOT READ: CODE '0' IF NONE.	DON'T KNOW	-8		
			REFUSED	-9		
Interviewer says: "Now I would like to ask you some questions about the <u>last</u> pregnancy that resulted in a live birth since the 1st of January, 2013."						
304	prgtwin	Did your last pregnancy result in birth to twins or more?	YES	1	IF prgtwin = 2, -8, -9	childlast
			NO	2	IF prgtwin = 1	pregnm
			DON'T KNOW	-8		
			REFUSED	-9		
	pregnm	How many live children were born from your last pregnancy?	Number of children	integer		
305		What is the name of the [BIRTHORDER*] born child from your last pregnancy that resulted in a live birth?		text		
		A live birth is when the baby shows signs of life, such as breathing, beating of the heart or movement.				
		DO NOT READ: IF THE CHILD WAS NOT NAMED BEFORE DEATH, INPUT BIRTH AND THE BIRTH ORDER NUMBER. FOR EXAMPLE, "BIRTH 1".				

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
306		What is the name of the child from your last 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. DO NOT READ: IF THE CHILD WAS NOT NAMED BEFORE DEATH, INPUT BIRTH 1.	NAME	text		
307	prgcare	When you were pregnant with [CHILDLAST/PRGTWINNAME*], did you visit a health facility for clinic visits for the pregnancy?	YES	1	IF prgcare = 1	item 309
			NO	2	IF prgcare = -8, -9	brthwhr
			DON'T KNOW	-8		
			REFUSED	-9		
308	pregncr	What is the <u>main</u> reason you did not visit a clinic for the pregnancy when you were pregnant with [CHILDLAST/PRGTWINNAME*]?	CLINIC WAS TOO FAR AWAY	1	IF pregncr != 96	brthwhr
			COULD NOT TAKE TIME OFF WORK/TOO BUSY	2		
			COULD NOT AFFORD TO PAY FOR THE VISIT	3		
			DID NOT TRUST THE CLINIC STAFF	4		
			RECEIVED CARE AT HOME	5		
			DID NOT WANT AN HIV TEST DONE	6		
			HUSBAND/FAMILY WOULD NOT LET ME GO	7		
			USED TRADITIONAL BIRTH ATTENDANT/HEALER	8		
			COST OF TRANSPORT	9		
			RELIGIOUS REASONS	10		
			OTHER (SPECIFY)	96		
			DON'T KNOW	-8		
			REFUSED	-9		
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."						
309	hivtsbp	Have you ever tested for HIV before your pregnancy with [CHILDLAST/PRGTWINNAME*]?	YES	1	IF hivtsbp = 2, -8, -9	hivtopg
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
310	hivpsbp	Did you test positive for HIV before your pregnancy with [CHILDLAST/PRGTWINNAME*]?	YES	1	IF hivpsbp = 2, -8, -9	hivtopg
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
311	arvfvst	At the time of your first clinic visit for the pregnancy when you were pregnant with [CHILDLAST/PRGTWINNAME*], were you taking ARVs, that is, antiretroviral medications, to treat HIV?	YES	1	IF arvfvst = 1	brthwhr
			NO	2	IF arvfvst = 2, -8, -9	arvtkpg
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
306		What is the name of the child from your last 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. DO NOT READ: IF THE CHILD WAS NOT NAMED BEFORE DEATH, INPUT BIRTH 1.	NAME	text		
307	prgcare	When you were pregnant with [CHILDLAST/PRGTWINNAME*], did you visit a health facility for clinic visits for the pregnancy?	YES	1	IF prgcare = 1	item 309
			NO	2	IF prgcare = -8, -9	brthwhr
			DON'T KNOW	-8		
			REFUSED	-9		
308	pregncr	What is the main reason you did not visit a clinic for the pregnancy when you were pregnant with [CHILDLAST/PRGTWINNAME*]?	CLINIC WAS TOO FAR AWAY	1	IF pregncr != 96	brthwhr
			COULD NOT TAKE TIME OFF WORK/TOO BUSY	2		
			COULD NOT AFFORD TO PAY FOR THE VISIT	3		
			DID NOT TRUST THE CLINIC STAFF	4		
			RECEIVED CARE AT HOME	5		
			DID NOT WANT AN HIV TEST DONE	6		
			HUSBAND/FAMILY WOULD NOT LET ME GO	7		
			USED TRADITIONAL BIRTH ATTENDANT/HEALER	8		
			COST OF TRANSPORT	9		
			RELIGIOUS REASONS	10		
			OTHER (SPECIFY)	96		
			DON'T KNOW	-8		
			REFUSED	-9		
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."						
309	hivtsbp	Have you ever tested for HIV before your pregnancy with [CHILDLAST/PRGTWINNAME*]?	YES	1	IF hivtsbp = 2, -8, -9	hivtopg
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
310	hivpsbp	Did you test positive for HIV before your pregnancy with [CHILDLAST/PRGTWINNAME*]?	YES	1	IF hivpsbp = 2, -8, -9	hivtopg
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
311	arvfvst	At the time of your first clinic visit for the pregnancy when you were pregnant with [CHILDLAST/PRGTWINNAME*], were you taking ARVs, that is, antiretroviral medications, to treat HIV?	YES	1	IF arvfvst = 1	brthwhr
			NO	2	IF arvfvst = 2, -8, -9	arvtkpg
			DON'T KNOW	-8		
			REFUSED	-9		
312	hivtopg	During any of your clinic visits for the pregnancy when you were pregnant with [CHILDLAST/PRGTWINNAME*], were you offered an HIV test?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
313	hivtprg	Were you tested for HIV during any of your clinic visits for the pregnancy when you were pregnant with [CHILDLAST/PRGTWINNAME*]?	YES	1	IF hivtprg = 1	hivrtpg
			NO	2	IF hivtprg = -8, -9	brthwhr
			DON'T KNOW	-8		
			REFUSED	-9		
314	hivtsnr	What is the main reason you were not tested for HIV during clinic visits for the pregnancy with [CHILDLAST/PRGTWINNAME*]?	DID NOT WANT AN HIV TEST DONE / DID NOT WANT TO KNOW MY STATUS	1	hivtsnr != 96	brthwhr
			DID NOT RECEIVE PERMISSION FROM SPOUSE/FAMILY	2		
			AFRAID OTHERS WOULD KNOW ABOUT TEST RESULTS	3		
			DID NOT NEED TEST/LOW RISK	4		
			OTHER (SPECIFY)	96		
			DON'T KNOW	-8		
			REFUSED	-9		
315	hivrtpg	What was the result of your last HIV test during your pregnancy with [CHILDLAST/PRGTWINNAME*]?	POSITIVE	1	IF hivrtpg = 2, 3, 4, -8, -9	brthwhr
			NEGATIVE	2		
			UNKNOWN/INDETERMINATE	3		
			DID NOT RECEIVE RESULTS	4		
			DON'T KNOW	-8		
			REFUSED	-9		
316	arvtkpg	Did you take ARVs during your pregnancy with [NAME] to stop [CHILDLAST/PRGTWINNAME*] from getting HIV? DO NOT READ: SHOW ARV GRAPHIC IF PARTICIPANT IS UNSURE.	YES	1	IF arvtkpg = 1, -8, -9	brthwhr
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
317	arvnrpg	What was the main reason you did not take ARVs while you were pregnant with [CHILDLAST/PRGTWINNAME*]?	WAS NOT PRESCRIBED	1	IF arvnrpg !=96	brthwhr
			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		
			OTHER (SPECIFY)	96		
			DON'T KNOW	-8		
			REFUSED	-9		
318	brthwhr	Where did you give birth to [CHILDLAST/PRGTWINNAME*]?	AT HOME	1	IF brthwhr = 1, 3, -8, -9	birthday
			AT A HEALTH FACILITY	2	IF brthwhr = 2	hivtobr
			IN TRANSIT	3		
			OTHER (SPECIFY)	96		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
319	hivtobr	Were you offered an HIV test during labor?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
320	hivttlb	Did you test for HIV during labor?	YES	1	SKIP IF hivpsbp = 1 OR hivrtpg = 1	
			NO	2	IF hivttlb = 2, -8, -9	birthday
			DON'T KNOW	-8		
			REFUSED	-9		
321	hivrslr	What was the result of that test?	POSITIVE	1	SKIP IF hivpsbp = 1 OR hivrtpg = 1	
			NEGATIVE	2	IF hivrslr = 2, 3, 4, -8, -9	childbdate
			UNKNOWN/INDETERMINATE	3		
			DID NOT RECEIVE RESULTS	4		
			DON'T KNOW	-8		
			REFUSED	-9		
322	offrarvs	During labor, were you offered ARVs to protect [NAME] against HIV? DO NOT READ: SHOW ARV GRAPHIC IF PARTICIPANT IS UNSURE.	YES	1	SKIP IF arvtkpg = 1	
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
323	arvtklb	During labor, did you take ARVs to protect [CHILDLAST/PRGTWINNAME*] against HIV? DO NOT READ: SHOW ARV GRAPHIC IF PARTICIPANT IS UNSURE	YES	1	SKIP IF arvtkpg = 1	
			NO	2	IF arvtklb = 2, -8, -9	birthday
			DON'T KNOW	-8		
			REFUSED	-9		
324	arvcntn	Did you continue to take the ARVs after delivery?	YES	1	-	
			NO	2	SKIP IF arvtkpg = 1	
			DON'T KNOW	-8		
			REFUSED	-9		
325	birthday1-2	When did you give birth to [CHILDLAST/PRGTWINNAME*]? Please give your best guess.	DAY	integer		
			DON'T KNOW DAY	-8		
			REFUSED DAY	-9		
			MONTH	integer		
			DON'T KNOW MONTH	-8		
			REFUSED MONTH	-9		
			YEAR	integer		
			DON'T KNOW YEAR	-8		
			REFUSED YEAR	-9		
326	childlive1-2	Is [CHILDLAST/PRGTWINNAME*] still alive?	YES	1	IF childalive* = 1, -8, -9	childlivewith
			NO	2		
			DON'T KNOW	-8		
			REFUSE	-9		
327	deathageyr1-2	How old was[CHILDLAST/PRGTWINNAME*] when he/she died? DO NOT READ: KEY '0' IF CHILD WAS LESS THAN ONE YEAR OLD.	YEARS _____		deathageyr* > 0, -8, -9	childarv
			DON'T KNOW	-8		
			REFUSED	-9		
328	deathagemo1-2	How old was [CHILDLAST/PRGTWINNAME*] in months when he/she died? DO NOT READ: KEY '0' IF CHILD WAS LESS THAN ONE MONTH OLD.	MONTHS _____		ALL	childarv
			DON'T KNOW	-8		
			REFUSED	-9		
329	childlivewith1-2	Is [CHILDLAST/PRGTWINNAME*] living with you?	YES	1	IF childlivewith* = 2	childarv
			NO	2		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
330	hhlnchild1-2	DO NOT READ: RECORD HOUSEHOLD LINE NUMBER OF CHILD RECORD '0' IF CHILD NOT LISTED IN HOUSEHOLD	HOUSEHOLD LINE NUMBER	integer		
331	childarv1-2	Did [CHILDLAST/PRGTWINNAME*] take any ARVs to stop [him/her] from getting HIV infection? This would be before [CHILDLAST/PRGTWINNAME*]'s first HIV test. DO NOT READ: SHOW ARV GRAPHIC IF PARTICIPANT IS UNSURE.	YES NO DON'T KNOW REFUSE	1 2 -8 -9	IF childarv* = 2, -8, -9	childbac*
332	childarvt1-2	For how long did [CHILDLAST/PRGTWINNAME*] take the ARVs to stop him/her from getting HIV? CODE '0' IF LESS THAN ONE WEEK. ONLY ONE OPTION MAY BE SELECTED. FOR EXAMPLE, ANSWER ONLY IN WEEKS OR IN MONTHS.	WEEKS MONTHS ARVS TAKEN ONCE STILL TAKING ARVS DON'T KNOW REFUSED	integer integer 96 97 -8 -9		
333	childbac1-2	Did [CHILDLAST/PRGTWINNAME*] take Bactrim or cotrimoxazole? This would be before [CHILDLAST/PRGTWINNAME*]'s first HIV test. Bactrim or cotrimoxazole is a medicine recommended for people with HIV, even if they have not started treatment for HIV. It helps prevent certain infections but it is not a treatment for HIV. DO NOT READ: SHOW COTRIMOXAZOLE GRAPHIC IF PARTICIPANT IS UNSURE.	YES NO, DID NOT TAKE COTRIM NO, CHILD NOT ALIVE DON'T KNOW REFUSED	1 2 3 -8 -9	IF childbac* = 2, 3, -8, -9	childbrstfd*
334	childbact1-2	For how long did [CHILDLAST/PRGTWINNAME*] take Bactrim or cotrimoxazole? ONLY ONE OPTION MAY BE SELECTED. FOR EXAMPLE, ANSWER ONLY IN WEEKS OR IN MONTHS. CODE '0' IF LESS THAN ONE WEEK.	WEEKS MONTHS STILL TAKING COTRIMOXOZOLE DON'T KNOW REFUSED	integer integer 97 -8 -9		
335	childbrstfd1-2	Did you ever breastfeed [CHILDLAST/PRGTWINNAME*]?	YES NO, NEVER BREASTFED NO, CHILD NOT ALIVE DON'T KNOW REFUSED	1 2 3 -8 -9	IF childbrstfd* = 2, 3, -8, -9	item 339*
337	childbrstfddur1-2 childbrstfddurnum1-2	For how long did you breastfeed [CHILDLAST/PRGTWINNAME*]? DO NOT READ: ONLY ONE OPTION MAY BE SELECTED. FOR EXAMPLE, ANSWER ONLY IN WEEKS OR IN MONTHS. CODE '0" WEEKS IF LESS THAN 1 WEEK.	WEEKS MONTHS STILL BREASTFEEDING DON'T KNOW REFUSED	integer integer 96 -8 -9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
338	childbfcont1-2	Did you continue taking ARVs while you were breastfeeding [CHILDLAST/PRGTWINNAME*]?	YES	1		
			NO	2	SKIP IF arvfvst = 1 OR arvtkpg = 1	
			DON'T KNOW	-8		
			REFUSED	-9		
339		Thank you for the information regarding [CHILDLAST/PRGTWINNAME*].			IF prgtwin = 1	RETURN TO childlive* FOR EACH VALUE OF prgtwinname*
Interviewer says: "I will now ask about current pregnancies."						
340	pregnant	Are you pregnant now?	YES	1	IF pregnant = 2,-8,-9	item 335
			NO	2		
			DON'T KNOW/UNSURE	-8		
			REFUSED	-9		
341	pregmonths	How many months pregnant are you?	MONTHS	integer	ALL	[NEXT MODULE]
		DO NOT READ: SHOW GRAPHIC OF PREGNANCY IF NOT SURE.	DON'T KNOW / UNSURE	-8		
			REFUSED	-9		
Interviewer says: "I will now ask you about family planning."						
342	avoidpreg	Are you or your partner currently doing something or using any method to delay or avoid getting pregnant?	YES	1	IF avoidpreg = 2, -8, -9	[NEXT MODULE]
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
343	cmethod_a	Which method are you or your partner using?	FEMALE STERILIZATION	A	IF cmethod_x != X	[NEXT MODULE]
	cmethod_b	DO NOT READ: SELECT ALL THAT APPLY.	MALE STERILIZATION	B		
	cmethod_c		PILL	C		
	cmethod_d		IUD/"COIL"	D		
	cmethod_e		INJECTIONS	E		
	cmethod_f		IMPLANT	F		
	cmethod_g		CONDOM	G		
	cmethod_h		FEMALE CONDOM	H		
	cmethod_i		RHYTHM/NATURAL METHODS	I		
	cmethod_j		WITHDRAWAL	J		
	cmethod_k		NOT HAVING SEX	K		
	cmethod_x		OTHER (SPECIFY)	X		
	cmethod_y		DON'T KNOW	Y		
	cmethod_z		REFUSED	Z		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 4: CHILDREN						
Interviewer says: "I am going to ask you a number of questions about your children regarding their health and where they get their health services. We will ask you about these children."						
		LIST OF CHILDREN < 14 ASSIGNED TO [NAME]				
401		Now I am going to ask you questions for [CHILD*].				
402	age	How old is [CHILD*] in years?	AGE IN YEARS	integer	IF age>=1 & age<=5	item 403a
		IF [CHILD*] IS LESS THAN 1 YEAR OLD, KEY 0 HERE AND KEY AGE IN MONTHS.	DON'T KNOW	-8	IF age > 5	gender
		ON NEXT SCREEN	REFUSED	-9	IF age <1	agem
403	agem	How old is [CHILD*] in months?	AGE IN MONTHS	integer	ALL	gender
403A		You said that [CHILD*] was [KIDAGEY*]. How many months over [KIDAGEY*] is [CHILD*]?	MONTHS OVER	integer	ALL	gender
404	gender	Is [CHILD*] a boy or girl?	BOY	1		
			GIRL	2		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
405	ch_kidenroll	Is [CHILD*] enrolled in school?	YES	1	IF ch_kidenroll =3, -8, -9	ch_kidenrlstyr
			NO, CURRENTLY NOT IN SCHOOL	2		
			NO, TOO YOUNG TO BE IN SCHOOL	3		
			DON'T KNOW	-8		
			REFUSED	-9		
406	ch_kidhighlvl	What is the highest level of school [CHILD*] has attended: primary, secondary, or high school?	PRIMARY	1	IF ch_kidhighlvl = -8, -9	ch_kidenrlstyr
			SECONDARY	2	IF ch_kidhighlvl = 96	ch_kidcrcm
			HIGH SCHOOL	3		
			NEVER ATTENDED SCHOOL	96		
			DON'T KNOW	-8		
			REFUSED	-9		
407	ch_kidclass	What grade/form is [CHILD*] in now?	GRADE/FORM	integer	SKIP IF ch_kidenroll = 2	
	ch_kidclassunit		NURSERY/KINDERGARTEN	0		
			GRADE	1		
			FORM	2		
			DON'T KNOW	-8		
			REFUSED	-9		
408	ch_kidenrlstyr	Was [CHILD*] enrolled in school during the previous school year?	YES	1	IF ch_kidenrlstyr = 2, -8, -9	ch_kidcrcm
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
409	ch_kidclasslstyr	What grade/form was [CHILD*] during the previous school year?	GRADE/FORM	integer		
	ch_kidclasslstyr unit		NURSERY/KINDERGARTEN	0		
			GRADE	1		
			FORM	2		
			DON'T KNOW	-8		
			REFUSED	-9		
410	ch_kidcrcm	Is [CHILD*] circumcised?	YES	1	SKIP IF gender = 2	
		Circumcision is the complete removal of the foreskin from the penis. I have a picture to show you what a completely circumcised penis looks like.	NO	2	IF ch_kidcrcm = 2, -8, -9	ch_kidhivtestevr
		DO NOT READ: SHOW GRAPHIC	DON'T KNOW	-8		
			REFUSED	-9		
411	ch_kidcrcmprt	Who circumcised [CHILD*]?	DOCTOR, CLINICAL OFFICER, OR NURSE	1	SKIP IF gender = 2	
			TRADITIONAL PRACTITIONER / CIRCUMCISER	2	IF ch_kidcrcmprt != 96	ch_kidhivtestevr
			MIDWIFE	3		
			OTHER (SPECIFY)	96		
			DON'T KNOW	-8		
			REFUSE TO ANSWER	-9		
412	ch_kidhivtestevr	Has [CHILD*] ever been tested for HIV?	YES	1	IF ch_kidhivtestevr = 1	ch_kidhivtestm/ch_kidhivtesty
			NO	2	IF ch_kidhivtestevr = -8, -9	ch_kidvisttbclin
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
413	ch_kidhivwhynever_a	Why has [CHILD*] never been tested for HIV?	DON'T KNOW WHERE TO TEST	A	ch_kidhivwhynever_x != X	ch_kidvisttbclin
	ch_kidhivwhynever_b	DO NOT READ: SELECT ALL THAT APPLY.	TEST COSTS TOO MUCH	B		
	ch_kidhivwhynever_c		TRANSPORT COSTS TOO MUCH	C		
	ch_kidhivwhynever_d		TOO FAR AWAY	D		
	ch_kidhivwhynever_e		AFRAID OTHERS WILL KNOW ABOUT TEST RESULTS	E		
	ch_kidhivwhynever_f		DON'T NEED TEST/LOW RISK	F		
	ch_kidhivwhynever_g		DID NOT RECEIVE PERMISSION FROM SPOUSE/FAMILY	G		
	ch_kidhivwhynever_h		AFRAID SPOUSE/PARTNER/FAMILY WILL KNOW RESULTS	H		
	ch_kidhivwhynever_i		DON'T WANT TO KNOW CHILD HAS HIV	I		
	ch_kidhivwhynever_j		CANNOT GET TREATMENT FOR HIV	J		
	ch_kidhivwhynever_k		TEST KITS NOT AVAILABLE	K		
	ch_kidhivwhynever_l		RELIGIOUS REASONS	L		
	ch_kidhivwhynever_x		OTHER (SPECIFY)	X		
	ch_kidhivwhynever_y		DON'T KNOW	Y		
	ch_kidhivwhynever_z		REFUSED	Z		
414	ch_kidhivtestm	What month and year was [CHILD*]'s most recent HIV test done?	MONTH	date		
			DON'T KNOW MONTH	-8		
			REFUSED MONTH	-9		
	ch_kidhivtesty		YEARS	date		
			DON'T KNOW YEAR	-8		
			REFUSED YEAR	-9		
415	ch_kidhivlastresult	What was [CHILD*]'s last HIV test result?	POSITIVE	1	IF ch_kidhivlastresult = 2, 3, 4, -8, -9	ch_kidvisttbclin
			NEGATIVE	2		
			UNKNOWN/INDETERMINATE	3		
			DID NOT RECEIVE RESULTS	4		
			DON'T KNOW	-8		
			REFUSED	-9		
416	ch_kidtldpos	Has [CHILD*] been told (or know) that he/she is HIV positive?	YES	1	IF ch_kidtldpos = 1, -8, -9	ch_kidlposm/ch_kidlposy
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
417	ch_kidnttldposrsn	Why has [CHILD*] not been told they are HIV positive?	CHILD IS TOO YOUNG	1	IF ch_kidnttldposrsn != 96	ch_kidlposm/ch_kidlposy
			CHILD IS DEVELOPMENTALLY CHALLENGED	2		
			PARENT/LEGAL GUARDIAN FEARS TALKING TO CHILD ABOUT HIV	3		
			OTHER (SPECIFY)	96		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
418	ch_kidlposm	What was the month and year of [CHILD*]'s first HIV positive test result? Please give your best guess.	MONTH	date		
		This will be the very first HIV positive test result that you have received.	DON'T KNOW MONTH	-8		
		DO NOT READ: PROBE TO VERIFY DATE.	REFUSED MONTH	-9		
	ch_kidlposy		YEARS	date		
			DON'T KNOW YEAR	-8		
			REFUSED YEAR	-9		
419	ch_kidhivcare	Has [CHILD*] ever received HIV care and treatment from a doctor, clinical officer or nurse?	YES	1	IF ch_kidhivcare = 1	ch_kidhivcarefirstm/ch_kidhivcarefirsty
			NO	2	IF ch_kidhivcare = -8, -9	ch_kidcd4
			DON'T KNOW	-8		
			REFUSED	-9		
420	ch_kidhivcarenvr	What is the main reason why [CHILD*] has never seen a doctor, clinical officer, or nurse for HIV care and treatment?	FACILITY IS TOO FAR AWAY	1	ch_kidhivcarenvr != 96	ch_kidcd4
			I DON'T KNOW WHERE TO GET HIV MEDICAL CARE FOR CHILD	2		
			COST OF CARE	3		
			COST OF TRANSPORT	4		
			I DON'T THINK CHILD NEEDS IT, HE/SHE IS NOT SICK	5		
			I FEAR PEOPLE WILL KNOW THAT CHILD HAS HIV IF I TAKE HIM/HER TO A CLINIC	6		
			RELIGIOUS REASONS	7		
			CHILD IS TAKING TRADITIONAL MEDICINE	8		
			CHILD HAS NOT BEEN TOLD THEY NEED HIV CARE	9		
			OTHER (SPECIFY)	96		
			DON'T KNOW	-8		
			REFUSED	-9		
421	ch_kidhivcarefirstm	What month and year did [CHILD*] first see a doctor, clinical officer or nurse for HIV care and treatment?	MONTH	date		
		DO NOT READ: PROBE TO VERIFY DATE.	DON'T KNOW MONTH	-8		
			REFUSED MONTH	-9		
	ch_kidhivcarefirsty		YEAR	date		
			DON'T KNOW YEAR	-8		
			REFUSED	-9		
422	ch_kidhivcarelastm	What month and year did [CHILD*] last see a doctor or nurse for HIV care and treatment?	MONTH	date	IF CURRENT DATE - ch_kidhivcarelastm/ch_kidhivcarelasty =< 6 MONTHS	ch_kidcd4
			DON'T KNOW MONTH	-8	IF ch_kidhivcarelastm/ch_kidhivcarelasty = -8, -9	ch_kidcd4
			REFUSED MONTH	-9		
	ch_kidhivcarelasty		YEAR	date		
			DON'T KNOW YEAR	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
423	ch_kidhivnot6rsn	What is the main reason for [CHILD*] not seeing a doctor, clinical officer or nurse for HIV care and treatment for more than 6 months?	FACILITY IS TOO FAR AWAY	1	IF ch_kidhivnot6rsn != 96	ch_kidcd4
			I DON'T KNOW WHERE TO GET HIV MEDICAL CARE FOR CHILD	2		
			COST OF CARE	3		
			COST OF TRANSPORT	4		
			I DON'T THINK CHILD NEEDS IT, HE/SHE IS NOT SICK	5		
			I FEAR PEOPLE WILL KNOW THAT CHILD HAS HIV IF I TAKE HIM/HER TO A CLINIC	6		
			RELIGIOUS REASONS	7		
			CHILD IS TAKING TRADITIONAL MEDICINE	8		
			NO APPOINTMENT SCHEDULED/DID NOT MISS MOST RECENT APPOINTMENT	9		
			OTHER (SPECIFY)	96		
			DON'T KNOW	-8		
			REFUSED	-9		
424	ch_kidcd4	Has [CHILD*] ever had a CD4 count test?	YES	1	IF ch_kidcd4 = 2, -8, -9 AND ch_kidhivcare = 1	ch_kidarvs
		The CD4 count tells you how sick you are with HIV.	NO	2	IF ch_kidcd4 = 2, -8, -9 AND ch_kidhivcare	ch_kidseptrin
			DON'T KNOW	-8	= 2, -8, -9	
			REFUSED	-9		
425	ch_kidcd4lastm	What month and year was [CHILD*] last tested for his/her CD4 count?	MONTH	date	IF ch_kidcd4lastm = -8, -9	ch_kidarvs
			DON'T KNOW MONTH	-8	IF ch_kidcd4lasty = -8, -9	ch_kidarvs
			REFUSED MONTH	-9		
	ch_kidcd4lasty		YEAR	date		
			DON'T KNOW YEAR	-8		
			REFUSED YEAR	-9		
426	ch_kidarvs	Has [CHILD*] ever taken ARVs, that is, antiretroviral medications, to treat his/her HIV infection?	YES	1	IF ch_kidarvs = 1	ch_kidarvsfirsty/ch_kidarvsfirstm
			NO	2		
		DO NOT READ: SHOW AID IF PARTICIPANT IS UNSURE.	DON'T KNOW	-8	IF ch_kidarvs = -8, -9	ch_kidseptrin
			REFUSED	-9		
427	ch_kidarvsnvrrsn	What is the main reason [CHILD*] has never taken ARVs?	CHILD IS NOT ELIGIBLE FOR TREATMENT	1	IF ch_kidarvsnvrrsn != 96	ch_kidseptrin
			HEALTH CARE PROVIDER DID NOT PRESCRIBE	2		
			HIV MEDICINES NOT AVAILABLE	3		
			DO NOT THINK CHILD NEEDS IT, HE/SHE IS NOT SICK	4		
			COST OF MEDICATIONS	5		
			COST OF TRANSPORT	6		
			RELIGIOUS REASONS	7		
			CHILD IS TAKING TRADITIONAL MEDICATIONS	8		
			CHILD HAS NOT BEEN TOLD THEY NEED ARVs	9		
			OTHER (SPECIFY)	96		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
428	ch_kidarvsfirstm	What month and year did [CHILD*] first start taking ARVs? [DO NOT READ]: FOR DO NOT KNOW: PROBE TO VERIFY DATE.	MONTH DON'T KNOW MONTH REFUSED MONTH	date -8 -9		
	ch_kidarvsfirsty		YEAR DON'T KNOW YEAR REFUSED YEAR	date -8 -9		
429	ch_kidarvsnow	Is [CHILD*] currently taking ARVs, that is, antiretroviral medications? By currently, I mean that [CHILD*] may have missed some doses but [CHILD*] is still taking ARVs.	YES NO DON'T KNOW REFUSED	1 2 -8 -9	- IF ch_kidarvsnow = 1, -8, -9	- ch_kidseptrin
430	ch_kidarvsnotrsn	Can you tell me the main reason why [CHILD*] is not currently taking ARVs?	I HAVE TROUBLE GIVING CHILD A TABLET EVERYDAY CHILD HAD SIDE EFFECTS/RASH FACILITY/PHARMACY TOO FAR AWAY TO GET MEDICATION REGULARLY COST OF MEDICATIONS COST OF TRANSPORT CHILD IS HEALTHY, HE/SHE IS NOT SICK FACILITY WAS OUT OF STOCK RELIGIOUS REASONS CHILD IS TAKING TRADITIONAL MEDICATIONS OTHER (SPECIFY) DON'T KNOW REFUSED	1 2 3 4 5 6 7 8 9 96 -8 -9	IF ch_kidarvsnotrsn != 96	ch_kidseptrin
431	ch_kidseptrin	Is [CHILD*] currently taking Bactrim, Septrin or cotrimoxazole? Bactrim, Septrin or cotrimoxazole is a medicine recommended for people with HIV, even if they have not started treatment for HIV. It helps prevent certain infections but it is not treatment for HIV. By currently, I mean that [CHILD*] may have missed some doses but is still taking Bactrim, Septrin or cotrimoxazole. DO NOT READ: SHOW AID IF PARTICIPANT IS UNSURE	YES NO I DON'T KNOW WHAT IT IS REFUSED	1 2 3 -9		
432	ch_kidvisttbclin	Has [CHILD*] ever visited a health facility or TB clinic for TB diagnosis or treatment?	YES NO DON'T KNOW REFUSED	1 2 -8 -9	IF ch_kidvisttbclin = 2, -8, -9	item 433
433	ch_kiddiagtb	Have you ever been told by a doctor, clinical officer or nurse that [CHILD*] had TB?	YES NO DON'T KNOW REFUSED	1 2 -8 -9	IF ch_kiddiagtb = 2, -8, -9	item 433
434	ch_kidtrttb	Was [CHILD*] ever treated for TB?	YES NO DON'T KNOW REFUSED	1 2 -8 -9	IF ch_kidtrttb = 2, -8, -9	item 433

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
435	ch_kidtrttcurr	Is [CHILD*] currently on treatment for TB?	YES	1		-
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
436	ch_kidtrttb6mo trt	The last time [CHILD*] was treated for TB, did [CHILD*] complete at least 6 months of treatment?	YES	1		
			NO, THE MEDICINE WAS STOPPED IN LESS THAN 6 MONTHS	2		
			NO, [NAME] IS STILL ON TREATMENT	3		
			DON'T KNOW	-8		
			REFUSED	-9		
Interviewer says: "Thank you for the information about [CHILD*]. "					IF ADDITIONAL CHILD ON ROSTER	RETURN TO START OF MODULE 4

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 5: MALE CIRCUMCISION						
Interviewer says: "I will be asking a few questions about circumcision. Circumcision is the complete removal of the foreskin from the penis. I have a picture to show you what a completely circumcised penis looks like."						
DO NOT READ: SHOW ILLUSTRATION						
501	mcriskr	Does male circumcision alone reduce the risk, or chance, of a man getting HIV completely, somewhat or not at all?	PROTECTS COMPLETELY	1		
			PROTECTS SOMEWHAT	2		
			NOT AT ALL	3		
			DON'T KNOW	-8		
			REFUSED	-9		
502	mccndms	Do you agree or disagree with the following statement: Men who are circumcised do not need to use condoms to protect themselves from HIV.	STRONGLY AGREE	1		
			AGREE	2		
			DISAGREE	3		
			STRONGLY DISAGREE	4		
			DON'T KNOW	-8		
			REFUSED	-9		
503	mchiv	Do you agree or disagree with the following statement: Men who are circumcised can have multiple sexual partners and not be at risk for HIV.	STRONGLY AGREE	1	-	-
			AGREE	2		
			DISAGREE	3		
			STRONGLY DISAGREE	4		
			DON'T KNOW	-8		
			REFUSED	-9		
504	mcstatus	Some men are uncomfortable talking about circumcision but it is important for us to have this information. Some men are circumcised and others are not. Are you circumcised?	YES	1	IF mcstatus = 1	mcage
			NO	2	IF mcstatus = -8, -9	[NEXT MODULE]
			DON'T KNOW	-8		
			REFUSED	-9		
505	mcplans	Are you planning to get circumcised?	YES	1	IF mcplans = 1, -8, -9	[NEXT MODULE]
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
506	mcnorsn_a	There may be different reasons why some men are circumcised and others are not. What are your reasons for not getting circumcised?	RESPONDENT OPPOSED	A	IF mcnorsn != 96	[NEXT MODULE]
	mcnorsn_b	SELECT ALL THAT APPLY.	PARTNER OPPOSED	B		
	mcnorsn_c		OTHERS OPPOSED	C		
	mcnorsn_d		RELIGIOUS PROHIBITION	D		
	mcnorsn_e		NO KNOWLEDGE ABOUT PROCEDURE UTILITY	E		
	mcnorsn_f		NO KNOWLEDGE SITE THAT PERFORMS PROCEDURE	F		
	mcnorsn_g		HEALTH CONCERNS	G		
	mcnorsn_h		FEAR OF SIDE EFFECTS	H		
	mcnorsn_i		LACK OF ACCESS TO FACILITY	I		
	mcnorsn_j		COSTS TOO MUCH	J		
	mcnorsn_k		INCONVENIENT	K		
	mcnorsn_l		INTERFERES WITH BODY'S NORMAL FUNCTIONING	L		
	mcnorsn_x		OTHER (SPECIFY)	X		
	mcnorsn_y		DON'T KNOW	Y		
	mcnorsn_z		REFUSED	Z		
507	mcage	How old were you when you were circumcised? Please give your best guess.	AGE IN YEARS	integer		
		DO NOT READ: IF LESS THAN ONE YEAR, CODE '0'	DON'T KNOW	-8		
			REFUSED	-9		
508	mcwho	Who did the circumcision?	DOCTOR, CLINICAL OFFICER, OR NURSE	1	IF mcwho != 96	mcyesrn_a - z
			TRADITIONAL PRACTITIONER / CIRCUMCISER	2		
			MIDWIFE	3		
			OTHER (SPECIFY)	96		
			DON'T KNOW	-8		
			REFUSED	-9		
509	mcyesrn_a	There may be different reasons why some men are circumcised and others are not. What are your reasons for getting circumcised?	RELIGION	A	IF mcyesrn_x != X	[NEXT MODULE]
	mcyesrn_b		PREVENT HIV	B		
	mcyesrn_c	DO NOT READ: SELECT ALL THAT APPLY.	DON'T HAVE TO USE A CONDOM	C		
	mcyesrn_d		HYGIENE	D		
	mcyesrn_e		MY PARTNER ASKED ME TO	E		
	mcyesrn_x		OTHER (SPECIFY)	X		
	mcyesrn_y		DON'T KNOW	Y		
	mcyesrn_z		REFUSED	Z		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 6: SEXUAL ACTIVITY						
Interviewer says: "In this part of the interview, I will be asking questions about your sexual relationships and practices. These questions will help us have a better understanding of how they may affect your life and risk for HIV. Let me assure you again 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."						
601	firstsxage	How old were you when you had vaginal sex for the very first time?	AGE IN YEARS	integer	IF firstsxage = 96	[NEXT MODULE]
		Vaginal sex is when a penis enters a vagina	NEVER HAD VAGINAL SEX	96		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
602	analsxever	People have sex in different ways. Some have vaginal sex. Some have anal sex. Anal sex is when a penis enters a person's anus. Have you ever had anal sex?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
603	lifetimesex	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 SEXUAL PARTNERS IN LIFETIME	integer		
		IF NUMBER OF SEXUAL PARTNERS IS GREATER THAN 100, ENTER '100'	DON'T KNOW	-8		
			REFUSED	-9		
604	firstsexcndm	The <u>first</u> time you had vaginal or anal sex, was a condom used?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
605	condomget	If you wanted a condom, would it be easy for you to get one?	YES	1	IF condomget = 1, -8, -9	part12monum
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
606	cmezrsn_a	Why is it not easy for you to get a condom?	CONDOMS NOT AVAILABLE/TOO FAR	A	SKIP IF condomget != 2	
	cmezrsn_b	DO NOT READ: SELECT ALL THAT APPLY.	NOT CONVENIENT	B		
	cmezrsn_c		COSTS TOO MUCH	C		
	cmezrsn_d		EMBARASSED TO GET CONDOMS	D	IF cmezrsn_x !=X	part12monum
	cmezrsn_e		DO NOT WANT OTHERS TO KNOW	E		
	cmezrsn_f		DO NOT KNOW WHERE TO GET CONDOMS	F		
	cmezrsn_x		OTHER (SPECIFY)	X		
	cmezrsn_y		DON'T KNOW	Y		
	cmezrsn_z		REFUSED	Z		
607	part12monum	People often have sex with different partners over their lifetime. In total, with how many different people have you had sex in the last 12 months?	NUMBER OF SEXUAL PARTNERS IN LAST 12 MONTHS	integer	IF part12monum = 0,-8,-9	sellsxever
		DO NOT READ: IF NONE, ENTER '0'.	DON'T KNOW	-8		
		IF NUMBER OF SEXUAL PARTNERS IS GREATER THAN 100, ENTER '100'	REFUSED	-9		
Interviewer says: "Now I would like to ask you some questions about the partners 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 your most recent partner."						
DO NOT READ ALOUD: ASK ONLY ABOUT THE LAST 3 PERSONS THE PARTICIPANT HAD SEX WITH.						
608	partlivew1-3	Does the person you had sex with live in this household?	YES	1	IF partlivew = 2	partid1-3
			NO	2		
609	partid1-3	Please select the name below from the household membership list. Please identify the person you had sex with.	LINE NO	integer		
610		I would like to ask you for the initials of your partner so I can keep track. They do not have to be the actual initials of your partner.	INITIALS	text		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
611	partrelation1-3	What is your relationship with [INITIALS]?	HUSBAND/WIFE	1	IF partrelation != 96	partgend1-3
			LIVE-IN PARTNER	2		
			PARTNER, NOT LIVING WITH RESPONDENT	3		
			EX-SPOUSE/PARTNER	4		
			FRIEND/ACQUAINTANCE	5		
			SEX WORKER	6		
			SEX WORKER CLIENT	7		
			STRANGER	8		
			OTHER (SPECIFY)	96		
			DON'T KNOW	-8		
			REFUSED	-9		
612	partgend1-3	Is [INITIALS] male or female?	MALE	1	SKIP IF partlivew = 1	
			FEMALE	2		
			DON'T KNOW	-8		
			REFUSED	-9		
613	partage1-3	How old is [INITIALS]? Please give your best guess.	AGE IN YEARS	integer		
			DON'T KNOW	-8		
			REFUSED	-9		
614	partfirstsxtime1-3	How long has it been since you first had sex with (INITIALS)?	Number of DAYS/WEEKS/MONTHS/YEARS	integer		
	partfirstsxunits1-3	DO NOT READ: IF LESS THAN ONE WEEK RECORD IN DAYS, IF LESS THAN ONE MONTH, RECORD IN WEEKS, IF. LESS THAN ONE YEAR, RECORD IN MONTHS, OTHERWISE RECORD IN YEARS	DAYS	1		
			WEEKS	2		
			MONTHS	3		
			YEARS	4		
			DON'T KNOW	-8		
			REFUSED	-9		
615	partlastsxtime1-3	How long has it been since you last had sex with (INITIALS)?	Number of DAYS/WEEKS/MONTHS	integer		
	partlastsxunits1-3	DO NOT READ: IF LESS THAN ONE WEEK RECORD IN DAYS, IF LESS THAN ONE MONTH, RECORD IN WEEKS, OTHERWISE RECORD IN MONTHS.	DAYS	1		
			WEEKS	2		
			MONTHS	3		
			DON'T KNOW	-8		
			REFUSED	-9		
616	partlastcndm1-3	The last time you had sex with [INITIALS] was a condom used?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
617	parttimes4wks1-3	In the last 4 weeks, what is the total number of times you had sex with [INITIALS]? By "times" we mean number of sex acts. For example, you could have sex 5 times with the same partner.	NUMBER OF TIMES	integer		
	parttimes4wksdk1-3	DO NOT READ: ENTER '0' IF NONE.	DON'T KNOW	-8		
			REFUSED	-9		
618	partcondfreqvag1-3	In the last 12 months, how often did you use condoms with [INITIALS] when having vaginal sex? Was it always, most of the time, sometimes, rarely or never? (Note: Due to a skip pattern error, this question was asked to very few participants.)	ALWAYS	1		
			MOST OF THE TIME	2		
			SOMETIMES	3		
			RARELY	4		
			NEVER	5		
			NO VAGINAL SEX IN THE LAST 12 MONTHS	6		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
619	partcondfreqanal1-3	In the last 12 months, how often did you use condoms with (INITIAL) when having anal sex? Was it always, most of the time, sometimes, rarely or never?	ALWAYS	1	SKIP IF analsxever != 1	
			MOST OF THE TIME	2		
			SOMETIMES	3		
			RARELY	4		
			NEVER	5		
			NO ANAL SEX IN THE LAST 12 MONTHS	6		
			DON'T KNOW	-8		
			REFUSED	-9		
620	partlube1-3	In the last 12 months, how often did you use lubricant with (INITIAL) when having anal sex? Was it always, most of the time, sometimes, rarely or never?	ALWAYS	1	SKIP IF analsxever != 1	
			MOST OF THE TIME	2		
			SOMETIMES	3		
			RARELY	4		
			NEVER	5		
			NO ANAL SEX IN THE LAST 12 MONTHS	6		
			DON'T KNOW	-8		
			REFUSED	-9		
621	partlastsup1-3	Did you enter into a sexual relationship with (INITIALS) because (INITIALS) provided you with gifts, help you to pay for things, or help you in other ways?	YES	1	SKIP IF partrelation1-3 = 6, 7	
			NO	2		-
			DON'T KNOW	-8		
			REFUSED	-9		
622	partlastsup21-3	Did you enter into a sexual relationship with (INITIALS) because you expected that (INITIALS) would provide you gifts, help you to pay for things, or help you in other ways?	YES	1	SKIP IF partrelation1-3 = 6, 7	
			NO	2	IF pastlastsup21-3= 2, -8, -9	partagain1-3
			DON'T KNOW	-8		
			REFUSED	-9		
623	partlastsupwhat_a1-3	In the last 12 months, what have you received from [INITIALS]?	DID NOT RECEIVE ANYTHING	A	IF partlastsupwhat_x1-3!= X	partagain1-3
	partlastsupwhat_b1-3		MONEY	B		
	partlastsupwhat_c1-3	SELECT ALL THAT APPLY.	FOOD	C	SKIP IF partrelation1-3 = 6, 7	
	partlastsupwhat_d1-3		SCHOOL FEES	D	SKIP IF partlastsup1-3 !=1 AND partlastsup21-3 !=1	
	partlastsupwhat_e1-3		EMPLOYMENT	E		
	partlastsupwhat_f1-3		GIFTS/FAVORS	F		
	partlastsupwhat_g1-3		TRANSPORT	G		
	partlastsupwhat_h1-3		SHELTER/RENT	H		
	partlastsupwhat_i1-3		PROTECTION	I		
	partlastsupwhat_x1-3		OTHER (SPECIFY)	X		
	no one selected		DON'T KNOW	Y		
	partlastsupwhat_z1-3		REFUSED	Z		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
624	partagain1-3	Do you expect to have sex with [INITIALS] again?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
625	partknowhiv1-3	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		
626	parthivsat1-3	What is the HIV status of [INITIALS]?	THINK (INITIALS) IS POSITIVE	1		
		DO NOT READ: READ RESPONSES ALOUD.	(INTIALS) TOLD ME HE/SHE IS POSITIVE	2		
			POSITIVE, TESTED TOGETHER	3		
			THINK (INITIALS) IS NEGATIVE	4		
			(INITIALS) TOLD ME HE/SHE IS NEGATIVE	5		
			NEGATIVE, TESTED TOGETHER	6		
			DON'T KNOW STATUS	7		
			REFUSED	-9		
		I will now ask you about the person you have had sex with previous to (INITIALS).				
627	sellsxever	Have you ever <u>sold</u> sex for money?	YES	1	IF sellsxever = 2, -8, -9	buysxever
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
628	sellsx12mo	In the last 12 months, have you <u>sold</u> sex for money?	YES	1	SKIP IF sellsxever != 1	
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
629	sellsxcndm	The last time you sold sex for money, was a condom used?	YES	1	SKIP IF sellsxever != 1	
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
630	buysxever	Have you <u>ever</u> paid money for sex?	YES	1	IF buysxever = 2, -8, -9	[NEXT MODULE]
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
631	buysx12mo	In the last 12-months, have you paid money for sex?	YES	1	SKIP IF buysxever != 1	
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
632	buysxcndm	The last time you paid money for sex, was a condom used?	YES	1	SKIP IF buysxever != 1	
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 7: HIV TESTING						
Interviewer says: "I would now like to ask you some questions about HIV testing."						
701	hivtstever	Have you <u>ever</u> **tested** for HIV?	YES	1	IF hivtstever = 1	lifetimehivtest
			NO	2	IF hivtstever = -8, -9	hivelikely
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
702	hivtstnors_a	Why have you never been tested for HIV?	DON'T KNOW WHERE TO TEST	A	IF hivtstnors_x != X	hivelikely
	hivtstnors_b		TEST COSTS TOO MUCH	B		
	hivtstnors_c	DO NOT READ: SELECT ALL THAT APPLY.	TRANSPORT COSTS TOO MUCH	C		
	hivtstnors_d		TOO FAR AWAY	D		
	hivtstnors_e		AFRAID OTHERS WILL KNOW ABOUT TEST RESULTS	E		
	hivtstnors_f		DON'T NEED TEST/LOW RISK	F		
	hivtstnors_g		DID NOT RECEIVE PERMISSION FROM SPOUSE/FAMILY	G		
	hivtstnors_h		AFRAID SPOUSE/PARTNER/FAMILY WILL KNOW RESULTS	H		
	hivtstnors_i		DON'T WANT TO KNOW I HAVE HIV	I		
	hivtstnors_j		CANNOT GET TREATMENT FOR HIV	J		
	hivtstnors_k		TEST KITS NOT AVAILABLE	K		
	hivtstnors_l		RELIGIOUS REASONS	L		
	hivtstnors_x		OTHER (SPECIFY)	X		
	hivtstnors_y		DON'T KNOW	Y		
	hivtstnors_z		REFUSED	Z		
703	lifetimehivtest	In your lifetime, how many times have you been tested for HIV?	NUMBER OF TIMES	integer	SKIP IF hivtstever != 1	
			DON'T KNOW	-8		
			REFUSED	-9		
704	hivtestm	What month and year was your last HIV test?	MONTH	integer		
			DON'T KNOW MONTH	-8		
			REFUSED MONTH	-9		
			YEARS	integer		
			DON'T KNOW YEAR	-8		
			REFUSED YEAR	-9		
705	hivtstlocation	Where was the <u>last</u> test done?	VCT FACILITY	1	IF hivtstlocation != 96	hivtstrslt
			MOBILE VCT	2		
			AT HOME	3		
			HEALTH CLINIC / FACIITY	4		
			HOSPITAL OUTPATIENT CLINIC	5		
			TB CLINIC	6		
			STI CLINIC	7		
			HOSPITAL INPATIENT WARDS	8		
			BLOOD DONATING CENTER	9		
			ANC CLINIC	10		
			OTHER (SPECIFY)	96		
			DON'T KNOW	-8		
			REFUSED	-9		
706	hivtstrslt	What was the result of that HIV test?	POSITIVE	1	IF hivtstrslt = 2, 3, 4, -8, -9	hivlikely
			NEGATIVE	2	IF hivtstrslt = 1	hivtm/hivty
			UNCERTAIN/INDETERMINATE	3		
			DID NOT RECEIVE THE RESULT	4		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
707	hivlikely	How likely do you think it is that you will get HIV?	VERY LIKELY SOMEWHAT LIKELY NOT LIKELY DON'T KNOW REFUSED	1 2 3 -8 -9		
Interviewer says: "Please tell me if you strongly agree, agree, disagree or strongly disagree with the following statements." [ASKED OF ALL PARTICIPANTS]						
708	allowwork	A person with HIV/AIDS should be allowed to work with other people	STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE DON'T KNOW REFUSED	1 2 3 4 -8 -9		
709	compassion	People who have HIV/AIDS deserve compassion	STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE DON'T KNOW REFUSED	1 2 3 4 -8 -9		
710	loserespect	People who are suspected of having HIV/AIDS lose respect in the community	STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE DON'T KNOW REFUSED	1 2 3 4 -8 -9		
711	evtest	Everyone should get tested for HIV.	STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE DON'T KNOW REFUSED	1 2 3 4 -8 -9		
712	hivonly	Only persons who think they might be infected with HIV should get an HIV. test	STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE DON'T KNOW REFUSED	1 2 3 4 -8 -9		
713	startimm	I would be willing to start treatment immediately if this would make me less infectious to a sexual partner, even if there was no benefit to my own. health	STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE DON'T KNOW REFUSED	1 2 3 4 -8 -9		
714	startsck	I would not want to start treatment now when I am feeling healthy because only people who are very sick need to take ARVs	STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE DON'T KNOW REFUSED	1 2 3 4 -8 -9	-	-
715	hivtfposm	What was the month and year of your first HIV positive test result? Please give your best guess. This will be the very first HIV positive test result that you have received DO NOT READ: PROBE TO VERIFY DATE.	MONTH DON'T KNOW MONTH REFUSED MONTH	date -8 -9	SKIP IF lifetimehivtest = 1 SKIP IF hivtstever !=1	
	hivtfposy		YEAR DON'T KNOW YEAR REFUSED YEAR	date -8 -9		
716	hivpostell_a hivpostell_b hivpostell_c hivpostell_d hivpostell_e hivpostell_x hivpostell_y no one selected	Who have you told that you are HIV positive? DO NOT READ: CHECK ALL THAT APPLY.	NO ONE SPOUSE/SEX PARTNER DOCTOR FRIEND FAMILY MEMBER OTHER (SPECIFY) DON'T KNOW REFUSED	A B C D E X Y Z	IF hivpostold != X SKIP IF hivtstrslt! =1	next item

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
Interviewer says: "Now I would like to ask you questions about your experiences with health care providers."					SKIP IF hivtstrslt! =1	
717	hivstathide	In the last 12 months, when you sought health care in a facility where your HIV status is not known, did you feel you needed to hide your HIV status?	YES	1	SKIP IF hivtstrslt! =1	
			NO, NO NEED TO HIDE	2		
			NO, DID NOT ATTEND HEALTH FACILITY IN LAST 12 MONTHS	3		
			DON'T KNOW	-8		
			REFUSED	-9		
718	hivstatdeniedcare	In the last 12 months, have you been denied health services including dental care, because of your HIV status?	YES	1	SKIP IF hivtstrslt! =1	
			NO	2		
			NO ONE KNOWS MY STATUS	3		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 8: HIV STATUS, CARE AND TREATMENT						
Interviewer says: "Now I'm going to ask you more about your experience with HIV support, care and treatment."					SKIP MODULE IF hivtstrslt = 2, 3, 4, -8, -9	
801	hivcare	After learning you had HIV, have you ever received HIV medical care and treatment from a doctor, clinical officer or nurse?	YES	1	IF hivcare = 1	hivcfm/hivcfy
			NO	2	IF hivcare = -8, -9	cd4testever
			DON'T KNOW	-8		
			REFUSED	-9		
802	hivcnotrsn	What is the main reason why you have never received HIV medical care and treatment from a doctor, clinical officer or nurse?	FACILITY IS TOO FAR AWAY	1	IF hivcnotrsn != 96	cd4testever
			I DON'T KNOW WHERE TO GET HIV MEDICAL CARE	2		
			COST OF CARE	3		
			COST OF TRANSPORT	4		
			I DO NOT NEED IT/I 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		
			OTHER (SPECIFY)	96		
			DON'T KNOW	-8		
			REFUSED	-9		
803	hivcfm	What month and year did you first see a doctor, clinical officer or nurse for HIV medical care and treatment? DO NOT READ: PROBE TO VERIFY DATE.	MONTH	date		
			DON'T KNOW MONTH	-8		
			REFUSED MONTH	-9		
	hivcfy		YEAR	date		
			DON'T KNOW YEAR	-8		
			REFUSED YEAR	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
804	hivclm	What month and year did you last see a doctor, clinical officer or nurse for HIV medical care?	MONTH	date	IF [CURRENT DATE] - hivclm/hivcly <= 7 MONTHS OR hivcml/hivcly = -8, -9	hivcdistance
			DON'T KNOW MONTH	-8		
			REFUSED MONTH	-9		
	hivcly		YEAR	date		
			DON'T KNOW YEAR	-8		
			REFUSED	-9		
805	hivcnot6mo	What is the main reason for not seeing a doctor, clinical officer or nurse for HIV medical care in the past 6 months?	FACILITY IS TOO FAR AWAY	1	IF hivcnot6mo != 96	cd4testever
			I DON'T KNOW WHERE TO GET HIV MEDICAL CARE	2		
			COST OF CARE	3		
			COST OF TRANSPORT	4		
			I DO NOT NEED IT/I 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		
			NO APPOINTMENT SCHEDULED/DID NOT MISS MOST RECENT APPOINTMENT	9		
			OTHER (SPECIFY)	96		
			DON'T KNOW	-8		
			REFUSED	-9		
806	cd4testever	Have you ever had a CD4 count test?	YES	1	IF cd4testever = 2, -8, -9 AND HIVCARE = 1	arvstakenev
		The CD4 count tells you how sick you are with HIV and if you need to take ARVs or other HIV medications.	NO	2	IF cd4testever = 2, -8, -9 AND HIVCARE = 2,-8, -9	[NEXT MODULE]
			DON'T KNOW	-8		
			REFUSED	-9		
807	cd4ttm	What month and year were you last tested for your CD4 count?	MONTH	date	-	-
			DON'T KNOW MONTH	-8		
			REFUSED MONTH	-9		
	cd4tty		YEAR	date		
			DON'T KNOW YEAR	-8		
			REFUSED YEAR	-9		
808	arvstakenev	Have you ever taken ARVs, that is, antiretroviral medications to treat HIV infection?	YES	1	IF arvstakenev = 1	arvftm/arvfty
			NO	2	IF arvstakenev = -8, -9	[NEXT MODULE]
			DON'T KNOW	-8		
			REFUSED	-9		
809	arvsnottake	What is the main reason you have never taken ARVs?	NOT ELIGIBLE FOR TREATMENT	1	IF arvsnottake != 96	[NEXT MODULE]
			HEALTH CARE PROVIDER DID NOT PRESCRIBE	2		
			HIV MEDICINES NOT AVAILABLE	3		
			I FEEL HEALTHY/NOT SICK	4		
			COST OF MEDICATIONS	5		
			COST OF TRANSPORT	6		
			RELIGIOUS REASONS	7		
			TAKING TRADITIONAL MEDICATIONS	8		
			NOT ATTENDING HIV CLINIC	9		
			OTHER (SPECIFY)	96		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
810	arvftm	What month and year did you first start taking ARVs?	MONTH	date		
		DO NOT READ: PROBE TO VERIFY DATE.	DON'T KNOW MONTH	-8		
			REFUSED MONTH	-9		
	arvfty		YEAR	date		
			DON'T KNOW YEAR	-8		
			REFUSED YEAR	-9		
811	arvscurrent	Are you currently taking ARVs, that is, antiretroviral medications?	YES	1	IF arvscurrent = 1	arvsmissdays
		By currently, I mean that you may have missed some doses but you are still taking ARVs.	NO	2	IF arvscurrent = -8, -9	[NEXT MODULE]
			DON'T KNOW	-8		
			REFUSED	-9		
812	arvsnotcurrsn	Can you tell me the main reason why you are not currently taking ARVs?	I HAVE TROUBLE TAKING A TABLET EVERYDAY	1	IF arvsnotcurrsn != 96	[NEXT MODULE]
			I HAD SIDE EFFECTS	2		
			FACILITY TOO FAR AWAY FOR ME TO GET MEDICINE REGULARLY	3		
			COST OF MEDICATIONS	4		
			COST OF TRANSPORT	5		
			I FEEL HEALTHY/NOT SICK	6		
			FACILITY WAS OUT OF STOCK	7		
			RELIGIOUS REASONS	8		
			TAKING TRADITIONAL MEDICATIONS	9		
			OTHER (SPECIFY)	96		
			DON' T KNOW	-8		
			REFUSED	-9		
813	arvsmissdays	People sometimes forget to take all of their ARVs every day. In the past 30 days, how many days have you missed taking any of your ARV pills ?	NUMBER OF DAYS	integer		
		DO NOT READ: CODE '0' IF NONE.	DON'T KNOW	-8		
			REFUSED	-9		
814	hivcdistance	At your last HIV care visit, approximately how long did it take you to travel from your home (or workplace) one way?	LESS THAN ONE HOUR	1		
			ONE TO TWO HOURS	2		
			MORE THAN TWO HOURS	3		
			DON'T KNOW	-8		
			REFUSED	-9		
815	hivccost	At your last HIV care visit, approximately how much did it cost to travel from your home (or workplace) one way?	COST	integer		
	hivccostdk	ENTER COST IN EMALENGENI.	DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 9: TUBERCULOSIS AND OTHER HEALTH ISSUES						
Interviewer says: "Now I will ask you about tuberculosis or TB."						
901	tbclinvisit	Have you ever visited a TB clinic (or health facility) for TB diagnosis or treatment?	YES	1	IF tbclinvisit = 2, -8, -9	[NEXT MODULE]
			NO	2		
			DON'T KNOW	-8		

			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
902	tbdiagn	Have you ever been told by a doctor, clinical officer or nurse that you had TB?	YES	1	IF tbdiagn = 2, -8, -9	[NEXT MODULE]
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
903	tbtreated	Were you ever treated for TB?	YES	1	IF tbtreated = 2, -8, -9	[NEXT MODULE]
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
904	tbttretcurr	Are you currently on treatment for TB?	YES	1	-	-
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
905	tbtreat6mofull	The last time you were treated for TB, did you complete at least 6 months of treatment?	YES	1		
			NO, MEDICINE WAS STOPPED IN LESS THAN 6 MONTHS	2		
			NO, BUT I AM STILL ON TREATMENT	3		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 10: ALCOHOL USE						
Interviewer says: "The next few questions will be on your use of alcohol. Remember, all the answers you provide will be kept confidential."						
1001	alcfreq	How often do you have a drink containing alcohol?	NEVER	0	IF alcfreq = 0, -8, -9	[NEXT MODULE]
		DO NOT READ: SHOW ALCOHOL AID.	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		
1002	alcnumday	How many drinks containing alcohol do you have on a typical day?	NONE OR LESS THAN 1	0	SKIP IF alcfreq = 0, -8, -9	
			1 OR 2	1		
			3 OR 4	2		
			5 OR 6	3		
			7 TO 9	4		
			10 OR MORE	5		
			DON'T KNOW	-8		
			REFUSED	-9		
1003	alcsixmore	How often do you have six or more drinks on one occasion?	NEVER	0	SKIP IF alcfreq = 0, -8, -9	
			LESS THAN MONTHLY	1		
			MONTHLY	2		
			WEEKLY	3		
			DAILY OR ALMOST DAILY	4		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 11: GENDER NORMS					SKIP IF curmar = 3, 4, 5, -8, -9	
Interviewer says: "Now I would like to ask you question on attitudes and decision-making in your home."						
1101	healthc	Who usually makes decisions about health care for yourself: you, your (spouse/partner), you and your (spouse/partner) together, or someone else?	I DO	1		
			SPOUSE/PARTNER	2		
			WE BOTH DO	3		
			SOMEONE ELSE	4		
			DON'T KNOW	-8		
			REFUSED	-9		
1102	money	Who generally decides about how the money you receive is spent: you, your (spouse/partner), you and your (spouse/partner) together, or someone else?	I DO	1		
			SPOUSE/PARTNER	2		
			WE BOTH DO	3		
			SOMEONE ELSE	4		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 12: VIOLENCE					IF gender = 1 OR IF gender = 2 AND NOT SELECTED	REFER
Interviewer says: "You have been selected to be asked questions on other important aspects of a person's life. I know that some of these questions are very personal. However, your answers are important for helping to understand the condition of men and women in Swaziland. Let me assure you that your answers are completely confidential and will not be told to anyone and no one in your household will know that you were asked these questions. **By sex, we mean vaginal, anal, oral sex or the insertion of an object into your vagina or anus. Vaginal sex is when a penis enters a vagina. Anal sex is when a penis enters an anus (butt). Oral sex is when a partner puts his/her mouth on his/her partner's penis or vagina."**						
1201	touchever	Have you ever been touched by someone in a sexual way without your permission?	YES	1	IF touchever = 2, -8, -9	frcsxtimes
		Touching in a sexual way without permission includes fondling, pinching, grabbing, or touching you on or around your sexual body parts.	NO	2		
			DON'T KNOW	-8		
		-	REFUSED	-9		
1202	touchtimes	How many times has anyone ever touched you in a sexual way without your permission, but did not try and force you to have sex?	NUMBER OF TIMES	integer	IF touchtimes = -8, -9	frcsxtimes
		Touching in a sexual way without permission includes fondling, pinching, grabbing, or touching you on or around your sexual body parts.	DON'T KNOW	-8		
			REFUSED	-9		
1203	touchage	How old were you the <u>first</u> time this happened?	AGE IN YEARS	integer		
			DON'T KNOW	-8		
			REFUSED	-9		
1204	frcsxtimes	How many times in your life have you been <u>physically forced</u> to have sex?	NUMBER OF TIMES	integer	IF frcsxtimes = 0, -8, -9	unwntseek
		CODE '0' IF NONE.	DON'T KNOW	-8		
			REFUSED	-9		
1205	frcsxage	How old were you the first time someone physically forced you to have sex?	AGE IN YEARS	integer		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
1206	frcsx12mo	In the past 12 months, did someone physically force you to have sex?	YES	1	IF frcsx12mo = 2, -8, -9	unwntseek
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
1207	frcsx12mowho	In the last 12 months, who physically forced you to have sex?	PARTNER	A	IF frcsx12mowho !=X	unwntseek
			RELATIVE	B		
		By partner, I mean a sexual partner whether or not you were married at the time.	STRANGER	C		
			OTHER	X		
			DON'T KNOW	Y		
			REFUSED	Z		
1208	uwntsxhelp_a	After any of these unwanted sexual experiences, did you try to seek professional help or services from any of the following?	I DID NOT TRY TO SEEK HELP	A	SKIP IF (touchtimes = 0, -8, -9) AND (frcsxtimes = 0, -8, -9)	
	uwntsxhelp_b	DO NOT READ: READ RESPONSES ALOUD.	HEALTHCARE PROFESSIONAL	B	IF unwntseek = A	unwntsxnohlp
	uwntsxhelp_c	SELECT ALL THAT APPLY.	POLICE OR OTHER SECURITY PERSONNEL	C	IF unwntseek = B, C, D, E, Y, Z	vlnc12motimes
	uwntsxhelp_d		SOCIAL WORKER, COUNSELOR OR NON-GOVERNMENTAL ORGANIZATION	D	IF unwntseek = X	unwntseekoth
	uwntsxhelp_e		RELIGIOUS LEADER	E		
	uwntsxhelp_x		OTHER (SPECIFY)	X		
	uwntsxhelp_y		DON'T KNOW	Y		
	uwntsxhelp_z		REFUSED	Z		
1209	unwntsxnohlp	What was the main reason that you did not try to seek help or services?	DID NOT KNOW SERVICES WERE AVAILABLE	1	IF unwntsxnohlp != 96	vlnc12motimes
			SERVICES NOT AVAILABLE	2		
			AFRAID OF GETTING IN TROUBLE	3		
			ASHAMED FOR SELF/FAMILY	4		
			COULD NOT AFFORD SERVICES	5		
			DID NOT THINK IT WAS A PROBLEM	6		
			FELT IT WAS MY FAULT	7		
			AFRAID OF BEING ABANDONED	8		
			DID NOT NEED/WANT SERVICES	9		
			AFRAID OF MAKING SITUATION WORSE	10		
			OTHER (SPECIFY)	96		
			DON'T KNOW	-8		
			REFUSED	-9		
1210	vlnc12motimes	In the past 12 months, how many times did someone: - Punched, kicked, whipped, or beat you with an object - Slapped you, threw something at you that could hurt you, pushed you or shoved you - Choked, smothered, tried to drown you, or burned you intentionally - Used or threatened you with a knife, gun or other weapon?	NOT IN LAST 12 MONTHS	1	IF vlnc12motimes = 1, -8, -9	END
			ONCE	2		
			FEW	3		
			MANY	4		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
1211	vlnc12mowho	In the last 12 months, who did any of these things to you? By partner, I mean a sexual partner whether or not you were married at the time.	PARTNER RELATIVE STRANGER OTHER DON'T KNOW REFUSED	A B C X Y Z	IF vlnc12mowho ! = X	seekhelp
1212	seekhelp_a	Thinking about all these experiences that we just discussed, whether someone has done the following:	I DID NOT TRY TO SEEK HELP	A	IF seekhelp = A	seekhelpwhynot
	seekhelp_b	- Punched, kicked, whipped, or beat you with an object	HEALTHCARE PROFESSIONAL	B	IF seekhelp = B, C, D, E, Y, Z	END
	seekhelp_c	- Slapped you, threw something at you that could hurt you, pushed you or shoved you	POLICE OR OTHER SECURITY PERSONNEL	C		
	seekhelp_d	- Choked, smothered, tried to drown you, or burned you intentionally	SOCIAL WORKER, COUNSELOR OR NON-GOVERNMENTAL ORGANIZATION	D		
	seekhelp_e	- Used or threatened you with a knife, gun or other weapon	RELIGIOUS LEADER	E		
	seekhelp_x	Did you try to seek professional help or services for any of these incidents from any of the following?	OTHER (SPECIFY)	X		
	seekhelp_y	DO NOT READ: READ RESPONSES ALOUD.	DON'T KNOW	Y		
	seekhelp_z	SELECT ALL THAT APPLY.	REFUSED	Z		
1213	seekhelpwhynot	What was the main reason that you did not try to seek help or services?	DID NOT KNOW SERVICES WERE AVAILABLE SERVICES NOT AVAILABLE AFRAID OF GETTING IN TROUBLE ASHAMED FOR SELF/FAMILY COULD NOT AFFORD SERVICES DID NOT THINK IT WAS A PROBLEM FELT IT WAS MY FAULT AFRAID OF BEING ABANDONED DID NOT NEED/WANT SERVICES AFRAID OF MAKING SITUATION WORSE OTHER (SPECIFY) DON'T KNOW REFUSED	1 2 3 4 5 6 7 8 9 10 96 -8 -9	IF seekhelpwhynot != 96	END
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."						

APPENDIX G YOUNG ADOLESCENT QUESTIONNAIRE

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 1: SOCIO-DEMOGRAPHIC CHARACTERISTICS						
101	gender	Gender was previously given as (Male/Female). If this is not correct, please review previously given answer in the eligibility form and update as needed.				
102	age	Age was previously given as (insert age). If this is not correct, please review previously given answer in the eligibility form and update as needed.				
103	adensch	Are you enrolled in school?	YES NO DON'T KNOW REFUSED	1 2 -8 -9	IF adensch = 2, -8, -9	adnoschreas
104	admisch	During the last school week, did you miss any school days for any reason?	YES NO DON'T KNOW REFUSED	1 2 -8 -9	IF admisch = 2, -8, -9	adcurgrd
105	admischreas	Why did you miss school?	I HAVE BEEN SICK I DON'T FEEL SAFE TRAVELING TO SCHOOL I DON'T FEEL SAFE WHILE IN SCHOOL I DON'T LIKE SCHOOL I HAVE TO LOOK AFTER MY FAMILY THERE'S NOT ENOUGH MONEY TO SEND ME TO SCHOOL SCHOOL IS TOO FAR AWAY I HAVE TO WORK I HAVE A CHILD OR I AM PREGNANT I MISSED TOO MUCH SCHOOL BECAUSE OF MY PERIOD (MENSTRUATION) OTHER (SPECIFY) DON'T KNOW REFUSED	1 2 3 4 5 6 7 8 9 10 96 -8 -9	IF admischreas != 96	adcurgrd
106	adcurgrd adcurgrd1	What grade/form are you in now? MARK EITHER GRADE OR FORM, AS APPROPRIATE	GRADE/FORM GRADE FORM DON'T KNOW REFUSED	integer 1 2 -8 -9		
107	adlstyrgd adlyrgrd1	What grade/form were you in last year? MARK EITHER GRADE OR FORM, AS APPROPRIATE	GRADE/FORM GRADE FORM DON'T KNOW REFUSED	integer 1 2 -8 -9	ALL	admedia_a - z

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
108	adnoschreas	Why do you NOT go to school?	I HAVE BEEN SICK	1	IF adnoschreas != 96	adatndsch
			I DON'T FEEL SAFE TRAVELING TO SCHOOL	2		
			I DON'T FEEL SAFE WHILE IN SCHOOL	3		
			I DON'T LIKE SCHOOL	4		
			I HAVE TO LOOK AFTER MY FAMILY	5		
			THERE'S NOT ENOUGH MONEY TO SEND ME TO SCHOOL	6		
			SCHOOL IS TOO FAR AWAY	7		
			I HAVE TO WORK	8		
			I HAVE A CHILD OR I AM PREGNANT	9		
			I MISSED TOO MUCH SCHOOL BECAUSE OF MY PERIOD (MENSTRUATION)	10		
			OTHER (SPECIFY)	96		
			DON'T KNOW	-8		
			REFUSED	-9		
109	adatndsch	Have you ***ever*** attended school?	YES	1	IF adatndsch = 2, -8, -9	admedia_a - z
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
110	adlstregsch	When was the last time you regularly attended school? Would you say it was less than a year ago or more than a year ago?	LESS THAN 1 YEAR	1		
			1 YEAR OR LONGER	2		
			DON'T KNOW	-8		
			REFUSED	-9		
111	adhigrade	What is the highest grade/form that you have completed?	GRADE/FORM	integer		
	adhiform	MARK GRADE OR FORM, AS APPROPRIATE.	NURSERY/KINDERGARTEN	0		
			GRADE	1		
			FORM	2		
			DON'T KNOW	-8		
			REFUSED	-9		
112	admedia_a	In the past 30 days, have you used any of the following form of communication?	SOCIAL NETWORKING/MEDIA	A		
	admedia_b	READ RESPONSES ALOUD.	INTERNET	B		
	admedia_c	SELECT ALL THAT APPLY.	TEXTING	C		
	admedia_y		DON'T KNOW	Y		
	admedia_z		REFUSED	Z		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 2: HIV KNOWLEDGE						
Interviewer says: "Now I would like to ask you some questions about what you know about some things related to HIV."						
201	adhrdhiv	Have you ***ever*** heard of HIV?	YES	1	IF adhrdhiv = 2, -8, -9	adykwcon
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
202	adhiv_a	From where have you heard about HIV?	SCHOOLS / TEACHERS	A	IF adhiv_x != X	addishiv
	adhiv_b	PROBE: "Anywhere else?"	PARENTS / GUARDIAN / FAMILY	B		
	adhiv_c	RECORD ALL MENTIONED	FRIENDS	C		
	adhiv_d		RELIGIOUS LEADERS	D		
	adhiv_e		INTERNET	E		
	adhiv_f		MOBILE PHONE	F		
	adhiv_g		HEALTH PROVIDERS / DOCTORS / NURSES / CLINICAL OFFICERS	G		
	adhiv_h		TELEVISION / FILM	H		
	adhiv_i		RADIO	I		
	adhiv_j		COMMUNITY HEALTH WORKERS	J		
	adhiv_x		OTHER (SPECIFY)	X		
	adhiv_y		DON'T KNOW	Y		
	adhiv_z		REFUSED	Z		
203	addishiv	Have you ***ever*** discussed HIV with your parents or guardian?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
204	adhip_a	Have you taken part in any of the following HIV prevention programs?	NONE	A	if adhip_x != X	adykwcon
	adhip_b	SHOW CHILD LOGO FOR EACH PROGRAM	STEPPING STONES	B		
	adhip_c	SELECT ALL THAT APPLY	ORPHANS AND VULNERABLE CHILDREN CASH TRANSFER	C		
	adhip_d		ORPHANS AND VULNERABLE CHILDREN GRANT	D		
	adhip_e		SUPPER BUDDIES	E		
	adhip_f		MANZINI YOUTH CARE	F		
	adhip_g		SWAZILAND YOUNG WOMEN'S NETWORK	G		
	adhip_h		TEEN CLUB	H		
	adhip_i		GLOW CLUB	I		
	adhip_j		BRO CLUB	J		
	adhip_x		OTHER (SPECIFY)	X		
	adhip_y		DON'T KNOW	Y		
	adhip_z		REFUSED	Z		
205	adykwcon	Do you know what a male condom is?	YES	1	IF adykwcon = 2, -9	[NEXT MODULE]
			NO	2		
			REFUSED	-9		
207	adclc_a	Where can a person go to get a male condom?	CLINIC / HOSPITAL	A	IF adclc_x != X	adcldcon
	adclc_b	SELECT ALL THAT APPLY	KIOSK / SHOP	B		
	adclc_c		PHARMACY	C		
	adclc_d		LOCAL FREE DISPENSER	D		
	adclc_e		FRIENDS / PEERS	E		
	adclc_f		BOYFRIEND / GIRLFRIEND	F		
	adclc_x		OTHER (SPECIFY)	X		
	adclc_y		DON'T KNOW	Y		
	adclc_z		REFUSED	Z		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
208	adcldcon	If you wanted to, could you yourself get a male condom?	YES NO DON'T KNOW REFUSED	1 2 -8 -9	IF adcldcon = 1, -8, -9	adcondem
209	adnez_a adnez_b adnez_c adnez_x adnez_y adnez_z	Why is it not easy for you to get a male condom? SELECT ALL THAT APPLY	TOO FAR COSTS TOO MUCH DO NOT WANT OTHERS TO KNOW OTHER (SPECIFY) DON'T KNOW REFUSED	A B C X Y Z	IF adnez_x != X	adcondem
210	adcondem	Have you ever seen a male condom demonstration? By a condom demonstration, I mean someone like a nurse or health educator showing people how a male condom is correctly used.	YES NO DON'T KNOW REFUSED	1 2 -8 -9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 3: SEXUAL BEHAVIOR						
Interviewer says: "The next questions ask about sexual behavior. There is no right or wrong answer. Your responses will not be linked to you in any way or shared with anyone, including your parents. You can choose not to answer any of the questions." DO NOT READ: PLEASE LOOK OUT FOR SIGNS OF DISTRESS IN CHILD WHEN ASKING THE FOLLOWING SEXUAL BEHAVIOR QUESTIONS. IF THE CHILD SEEMS DISTRESSED, ASK CHILD IF HE/SHE WANTS TO STOP THE INTERVIEW.						
301	adknsx	Do you know what sex is?	YES NO DON'T KNOW REFUSED	1 2 -8 -9	(IF (age <13) & (adknsx = 2, -8, -9))	adlghiv
302	adhdsx	Have you **ever** had sex?	YES NO DON'T KNOW REFUSED	1 2 -8 -9	IF adhdsx = 2, -8, -9	adtpsx
303	adsxage	How old were you when you had sex for the ***first*** time? IF CHILD IS UNSURE OF AGE, PROBE BY ASKING WHEN THEY FIRST HAD SEX AND HELPING THEM CALCULATE.	AGE IN YEARS DON'T KNOW AGE REFUSED	integer -8 -9		
304	adwhysx	The ***first*** time you had sex, was it because you wanted to or because you were forced?	WANTED TO FORCED DON'T KNOW REFUSED	1 2 -8 -9	IF adwhysx = ~~1~~, -8, -9 IF adwhysx = 1	adsxfrsn adfpsxage
305	adsxfrc	The ***first*** time you had sex, were you physically forced or were you pressured into having sex through harassment, threats or tricks?	PHYSICALLY FORCED PRESSURED DON'T KNOW REFUSED	1 2 -8 -9	ALL	adfpsxage
306	adsxfrsn	What was the ***main*** reason that you had sex for the first time?	IT JUST HAPPENED MY FRIENDS PRESSURED ME TO HAVE SEX TO SHOW MY LOVE / TO FEEL LOVED I WANTED TO HAVE SEX MY BOYFRIEND / GIRLFRIEND WANTED TO HAVE SEX FOR MONEY / GIFTS I WANTED TO HAVE A BABY OTHER (SPECIFY) DON'T KNOW REFUSED	1 2 3 4 5 6 7 96 -8 -9	IF adsxfrsn != 96	adfpsxage

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
307	adfpsxage	How old was the person you ***first*** had sex with? Please give your best guess.	AGE IN YEARS DON'T KNOW AGE REFUSED	integer -8 -9		
308	adfsxcon	The ***first*** time you had sex, was a condom used?	YES NO DON'T KNOW REFUSED	1 2 -8 -9	SKIP IF adykwcon = 2	
309	addifpsx	In total, how many different people have you had sex with? Please give your best guess.	NUMBER OF PARTNERS DON'T KNOW REFUSED	integer -8 -9		
310	adsex30dy	In the last 30 days, how many times have you had sex?	NUMBER OF TIMES DON'T KNOW REFUSED	integer -8 -9		
311	adltsxcon	The ***last*** time you had sex was a condom used?	YES NO DON'T KNOW REFUSED	1 2 -8 -9	SKIP IF adykwcon = 2	
312	admatsup	Sometimes people have sex to get material support. Material support means someone providing you gifts, helping to pay for things or helping you in other ways. Have you ever had sex with someone because you expected material support?	YES NO DON'T KNOW REFUSED	1 2 -8 -9		
313	adpsup12_a	In the last 12 months, what material support have you received from any of your sexual partners?	DID NOT RECEIVE ANYTHING	A	ALL	adcmth_a-z
	adpsup12_b	SELECT ALL THAT APPLY.	MONEY	B		
	adpsup12_c		FOOD	C		
	adpsup12_d		SCHOOL FEES	D		
	adpsup12_e		EMPLOYMENT	E		
	adpsup12_f		GIFTS/FAVORS	F		
	adpsup12_g		TRANSPORT	G		
	adpsup12_h		SHELTER/RENT	H		
	adpsup12_i		PROTECTION	I		
	adpsup12_x		OTHER (SPECIFY)	X		
	adpsup12_y		DON'T KNOW	Y		
	adpsup12_z		REFUSED	Z		
314	adpreg	Have you ***ever*** been pregnant?	YES NO DON'T KNOW REFUSED	1 2 -8 -9	SKIP IF gender=1	
315	adcmth_a	What are you or your sexual partner currently doing to prevent pregnancy?	NOTHING	A	if adcmth_x != X	adtpsx
	adcmth_b	SELECT ALL THAT APPLY.	PILL	B		
	adcmth_c		IUD/"COIL"	C		
	adcmth_d		INJECTIONS	D		
	adcmth_e		IMPLANT	E		
	adcmth_f		CONDOM	F		
	adcmth_g		FEMALE CONDOM	G		
	adcmth_h		RHYTHM/NATURAL METHODS	H		
	adcmth_i		WITHDRAWAL	I		
	adcmth_j		ANAL SEX	J		
	adcmth_k		ORAL SEX	K		
	adcmth_x		OTHER (SPECIFY)	X		
	adcmth_y		DON'T KNOW	Y		
	adcmth_z		REFUSED	Z		
316	adtpsx	Have you ***ever*** talked with a parent or guardian about sex?	YES NO DON'T KNOW REFUSED	1 2 -8 -9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 4: HIV RISK PERCEPTIONS					SKIP MODULE IF adhrdhiv = 2, -8, -9	
401	adlghiv	How likely do you think it is for you to get HIV?	VERY LIKELY	1	IF adlghiv = 4, -8, -9	[NEXT MODULE]
			SOMEWHAT LIKELY	2	IF adlghiv = 3	admrnlhiv
			NOT LIKELY	3		
			I ALREADY HAVE HIV	4		
			DON'T KNOW	-8		
			REFUSED	-9		
402	admrlhiv	What is the ***main*** reason you think you are likely to get HIV?	I HAVE HAD SEX WITHOUT A CONDOM	1	IF admrlhiv != 96	[NEXT MODULE]
			I HAVE OR HAD MANY BOY/GIRLFRIENDS	2		
			I HAVE HAD BLOOD TRANSFUSIONS	3		
			MY MOTHER/FATHER/ CLOSE RELATIVE HAS HIV	4		
			I DON'T TRUST MY BOY/GIRLFRIEND	5		
			I AM SICK	6		
			MY BOY/GIRLFRIEND IS SICK OR HAS DIED	7		
			I DESERVE IT / I AM A BAD PERSON	8		
			OTHER (SPECIFY)	96		
			DON'T KNOW	-8		
			REFUSED	-9		
403	admrnlhiv	What is the ***main*** reason you think you are not likely to get HIV?	I AM ABSTINANT	1	IF admrnlhiv != 96	[NEXT MODULE]
			I ALWAYS USE CONDOMS	3		
			I TRUST MY PARTNER	4		
			I HAVE ONLY ONE PARTNER	5		
			I GO TO CHURCH	6		
			I AM A GOOD PERSON	7		
			OTHER (SPECIFY)	96		
			DON'T KNOW	-7		
			REFUSED	-8		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 5: HIV KNOWLEDGE					SKIP MODULE IF adhrdhiv = 2, -8, -9	
501	adghiv_a	How do people acquire HIV?	SEX	A	IF adghiv_x != X	adrednosx
	adghiv_b		FROM MOTHER'S BLOOD	B		
	adghiv_x		OTHER (SPECIFY)	X		
	adghiv_y		DON'T KNOW	Y		
	adghiv_z		REFUSED	Z		
502	adrednosx	Can a person reduce their chance of getting HIV by not having sex?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
503	adredcon	Can a person reduce their chance of getting HIV by using condoms when having sex?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
504	adlkshiv	Can a healthy-looking person have HIV or AIDS?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
505	admhivubb	Can a mother with HIV or AIDS pass HIV to her unborn baby?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
506	admedll	Are there medicines that people with HIV or AIDS can take to help them live longer?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
507	adcirhiv	Can male circumcision help prevent HIV infection? Circumcision is the removal of the foreskin from a penis.	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
508	adarvless	Can ARVs make people with HIV less likely to spread the virus?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
509	admosquito	Can a person get HIV from a mosquito bite?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 6: HIV TESTING					SKIP MODULE IF adhrdhiv = 2, -8, -9	
Interviewer says: "I would now like to ask you some questions about HIV testing."						
601	adcldtest	If you wanted to, could you get an HIV test?	YES	1	IF adcldtest = 1, -8, -9	adevtestalt
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
602	adnttst_a	What are the reasons why you could not get an HIV test if you wanted to? SELECT ALL THAT APPLY.	CLINIC TOO FAR	A	IF adnttst_x=! X	adevtestalt
	adnttst_b		TEST COSTS TOO MUCH	B		
	adnttst_c		DO NOT WANT OTHERS TO KNOW	C		
	adnttst_x		OTHER (SPECIFY)	X		
	adnttst_y		DON'T KNOW	Y		
	adnttst_z		REFUSED	Z		
603	adevtestalt	Should everyone get tested for HIV?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
604	adtshiv	Have you ***ever*** been tested for HIV?	YES	1	IF adtshiv = 2, -8, -9	[NEXT MODULE]
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
605	adrcrshiv	Did you receive the results of any of your HIV tests?	YES	1	IF adrcrshiv = 2, -8, -9	[NEXT MODULE]
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
606	adrshiv	What was the result of that HIV test?	HIV POSITIVE	1	IF adrshiv = 2, -8, -9	[NEXT MODULE]
			HIV NEGATIVE	2		
			DON'T KNOW	-8		
			REFUSED	-9		
607	adtxhiv	Are you currently on treatment for HIV?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
608	adwkhv_a	Aside from a health care worker, who knows about your HIV status?	NO ONE	A	IF adwknhv_x != X	[NEXT MODULE]
	adwkhv_b	SELECT ALL THAT APPLY.	PARENT	B		
	adwkhv_c		GRAND PARENT	C		
	adwkhv_d		SPOUSE/SEX PARTNER	D		
	adwkhv_e		FRIEND	E		
	adwkhv_f		OTHER FAMILY MEMBER	F		
	adwkhv_x		OTHER (SPECIFY)	X		
	adwkhv_y		DON'T KNOW	Y		
	adwkhv_i		REFUSED	Z		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 7: HIV STIGMA					SKIP IF (adhrdhiv = 2, -8, -9) OR (adrshiv = 1) OR (adlghiv = 3)	
Interviewer says: "Now I would like to ask you some more question about HIV."						
701	adshfdhiv	Would you be willing to share food with someone who has HIV?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
702	adteachhiv	Would you be comfortable to have a teacher who has HIV?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
703	adplhiv	Would you be friends with someone who has HIV?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 8: ALCOHOL AND DRUGS						
Interviewer says: "I would like to ask you some questions about alcohol and drugs or substances that you may have taken that were not given to you by doctor. Your answers will not be told to anyone, even your parents. You can choose not to answer any of these questions."						
801	adhdalc	Have you ever had more than a few sips of alcohol, for example beer, cider, wine, liquor, or traditional brew? SHOW GRAPHIC IF HE OR SHE IS UNSURE	YES	1	IF adhdalc = 2, -8, -9	item 904
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
802	admnondrk	During the past 1 month, on how many days did you have at least one drink containing alcohol? We count one drink of alcohol as one can or bottle of beer, one glass of wine, or one shot of liquor, or a cup of traditional brew.	NUMBER OF DAYS	integer		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
803	adalcsixmore	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		
804	addtr_a	What drugs have you ***ever*** tried?	NONE	A	if addttr_x != X	[NEXT MODULE]
	addtr_b	DO NOT READ: DO NOT READ RESPONSES.	MARIJUANA	B		
	addtr_c	PROBE FOR MULTIPLE RESPONSES.	GLUE/PAINT THINNER/POLISH REMOVER/BENZENE	C		
	addtr_d	RECORD ALL MENTIONED	NYAOPE/UNGA	D		
	addtr_e		ECSTASY	E		
	addtr_x		OTHER (SPECIFY)	X		
	addtr_y		DON'T KNOW	Y		
	addtr_z		REFUSED	Z		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 9: PARENTAL SUPPORT						
901	adparprb	If you have a problem, can you freely go to your parents/guardians for help?	YES	1		
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
902	adparfrtm	Do your parents/guardians really know what you were doing with your free time when you were not at school or work?	ALWAYS	1		
			MOST OF THE TIME	2		
			SOMETIMES	3		
			RARELY	4		
			NEVER	5		
			DON'T KNOW	-8		
			REFUSED	-9		

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
MODULE 10: VIOLENCE						
Interviewer says: "Now I would like to ask you questions about some other important aspects of a person's life. I know that some of these questions are very personal. However, your answers are important for helping to understand the condition of children in Swaziland. Let me assure you that your answers are completely confidential and will not be told to anyone. You can choose not to answer any of these questions."						

1001	adattck	Has anyone ***ever*** done any of these things to you:
		
		- Punched, kicked, whipped, or beat you with an object such as a stick
		- Choked smothered, tried to drown you, or burned you intentionally
		- Used or threatened you with a knife, gun or other weapon?
			YES
			
			NO
			
			DON'T KNOW
			
			REFUSED
				1
				
				2
				
				-8
				
				-9
					IF (age >=13 OR adknsx = 1) AND adattck = 2, -8, -9
					
					IF (age <13 AND adknsx = 2, -8, -9)
					AND adattck = 2,-8,-9
						adsxltch
						
						adsxltch

1002	adattkrel	The ***first*** time this happened, what was your relationship to the person who did this? If it was more than one person, what was your relationship with the person you knew the best?	BOYFRIEND / GIRLFRIEND / SPOUSE RELATIVE / FAMILY MEMBER CLASSMATE / SCHOOLMATE TEACHER POLICE / SECURITY / OFFICER / MILITARY EMPLOYER NEIGHBOR COMMUNITY RELIGIOUS LEADER FRIEND STRANGER OTHER (SPECIFY) DON'T KNOW REFUSED	1 2 3 4 5 6 7 8 9 10 96 -8 -9	IF (age >=13 OR adknsx = 1) AND adattkrel != 96 IF age <13 AND adknsx = 2, -8, -9	adsxltch adsxltch
1003	adsxltch	Has anyone ***ever*** touched your [penis or buttock, vagina, buttock, or breast] when you did not want them to? This could be pinching, grabbing, or touching you on or around your [penis or buttock, buttock, vagina, buttock, or breast].	YES NO DON'T KNOW REFUSED	1 2 -8 -9	SKIP IF age > 12 ALL	adtchwopm REFER
1004	adtchwopm	Has anyone ***ever*** touched you in a sexual way without your permission, but did not try and force you to have sex? Touching in a sexual way without permission includes fondling, pinching, grabbing, or touching you on or around your sexual body parts.	YES NO DON'T KNOW REFUSED	1 2 -8 -9	IF adtchwopm = 2, -8, -9	adprsxscc
1005	adftrel	The ***first*** time this happened, what was your relationship to the person who did this? If it was more than one person, what was your relationship with the person you knew the best?	BOYFRIEND / GIRLFRIEND / SPOUSE RELATIVE / FAMILY MEMBER CLASSMATE / SCHOOLMATE TEACHER POLICE / SECURITY / OFFICER / MILITARY EMPLOYER NEIGHBOR COMMUNITY RELIGIOUS LEADER FRIEND STRANGER OTHER (SPECIFY) DON'T KNOW REFUSED	1 2 3 4 5 6 7 8 9 10 96 -8 -9	IF adftrel != 96	adprsxscc

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
Interviewer says: "You said before that you had been pressured or forced to have sex. I'm going to ask you again about these topics."					SKIP IF adwhysx != 2	
1006	adprsxscc	Has anyone ***ever*** pressured you to have sex, through harassment, threats or tricks and did succeed?	YES NO DON'T KNOW REFUSED	1 2 -8 -9		
1007	adfrcscc	Has anyone ***ever*** physically forced you to have sex and did succeed?	YES NO DON'T KNOW REFUSED	1 2 -8 -9		
1008	adfrcrel	The ***first*** time you were pressured or forced to have sex, what was your relationship to the person who did this?	BOYFRIEND / GIRLFRIEND / SPOUSE RELATIVE / FAMILY MEMBER CLASSMATE / SCHOOLMATE TEACHER POLICE / SECURITY OFFICER / MILITARY EMPLOYER NEIGHBOR COMMUNITY RELIGIOUS LEADER FRIEND STRANGER OTHER (SPECIFY) DON'T KNOW REFUSED	1 2 3 4 5 6 7 8 9 10 96 -8 -9	SKIP Q IF (adprsxscc = 2, -8, -9) AND (adfrcscc = 2,-8,-9) IF adfrcrel != 96	adprosvc
1009	adprsv_a adprsv_b adprsv_c adprsv_d adprsv_f adprsv_g adprsv_x adprsv_y adprsv_z	After any of these unwanted sexual experiences, did you try to seek help or services from any of the following? READ RESPONSES ALOUD. SELECT ALL THAT APPLY.	I DID NOT TRY TO SEEK HELP HEALTHCARE FACILITY POLICE NON-GOVERNMENTAL ORGANIZATION GOVERNMENT ORGANIZATION LAWYER'S OFFICE OTHER (SPECIFY) DON'T KNOW REFUSED	A B C D F G X Y Z	SKIP Q IF (adtchwopm = 2, -8, -9) AND (adprsxscc = 2, -8, -9) AND (adfrcscc = 2, -8, -9) IF adprosvc = B, C, D,F, G, Y, Z IF adprosvc = A	 adsxtell adrsprsvc
1010	adrsprsvc	What was the main reason that you did not try to seek help or services?	DID NOT KNOW SERVICES WERE AVAILABLE SERVICES NOT AVAILABLE AFRAID OF GETTING IN TROUBLE ASHAMED FOR SELF/FAMILY COULD NOT AFFORD SERVICES DID NOT THINK IT WAS A PROBLEM FELT IT WAS MY FAULT AFRAID OF BEING ABANDONED DID NOT NEED / WANT SERVICES OTHER (SPECIFY) DON'T KNOW REFUSED	1 2 3 4 5 6 7 8 9 96 -8 -9	IF adrsprsvc != 96	adsxtell

NO.	VARIABLE	QUESTIONS	CODING LABELS	CODING VALUES	SKIP PATTERNS	SKIP TO
1011	adsxtell	After any of these unwanted sexual experiences, did you tell anyone about it?	YES	1	if adsxtell = 2, -8, -9	REFER
			NO	2		
			DON'T KNOW	-8		
			REFUSED	-9		
1012	adsdsc_a	Which of the following describes who you told about any of these unwanted sexual experiences?	PARENT / GUARDIAN	A	if adsdsc_x != X	REFER
	adsdsc_b	DO NOT READ: SELECT ALL THAT APPLY	SIBLING	B		
	adsdsc_c		TEACHER	C		
	adsdsc_d		FRIEND/CLASSMATE	D		
	adsdsc_e		OTHER FAMILY MEMBER	E		
	adsdsc_f		RELIGIOUS LEADER	F		
	adsdsc_x		OTHER (SPECIFY)	X		
	adsdsc_y		DON'T KNOW	Y		
	adsdsc_z		REFUSED	Z		
Interviewer says: "Thank you for sharing your personal experiences with me. I know it may have been difficult for you to talk about your experiences with me. If you would like to talk further about these experiences, I can refer you to a place that can provide you with help."					SKIP IF (adattck = 2, -8, -9) AND (adsxltch = 2, -8, -9) AND adprsxscc = 2, -8, -9) AND (adfrcscc = 2, -8, -9)	
		DO NOT READ: PROVIDE PARTICIPANT WITH LIST OF ORGANIZATIONS.				
Interviewer says: "This is the end of the survey. Thank you very much for your time and for your responses."						**End of Individual Questionnaire**

APPENDIX H SURVEY CONSENT FORMS

Consent for Household Interview

Interviewer reads:

Hello. My name is_____. I would like to invite you to take part in this survey about HIV in Swaziland. The Government of Swaziland is leading this survey in partnership with the United States Centers for Disease Control and Prevention and ICAP at Columbia University.

What language do you prefer for our discussion today?

___siSwati ___ English

Title of Survey: This survey is called the **Swaziland HIV Incidence Measurement Survey** (SHIMS 2, 2016)

Purpose of survey
This survey will help us to know how many people in Swaziland are living with HIV and need health services. It will also tell us about people's risk for HIV and who has been infected recently. About 6,000 households will join this survey. We would like your household to join the survey too, even if people in the household are already aware of their HIV status. What you tell us will help the Ministry of Health make health services better 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
If you join this survey, we will ask you questions and your answers will be kept between us. There are two parts to this survey– a household interview and individual interviews. In the household interview, we would like to ask you some questions about the people living in your household. We will ask how many people live here, their relationship to you and to each other, their gender, and age. We will ask you about people who are ill or recently died in your household. We will also ask you about some of the things you have in your household. The household interview will take up to 45 minutes.

After completing the household interview, we would begin the individual interviews. We would like to invite you and others living in your household to take part in the second part of this survey. We will ask each person to give his or her written permission to take part before joining the survey.

Costs for being in the survey: There is no cost to you for being in the household interview, except for your time.

Right to refuse or withdraw
Your taking part in this household interview is entirely voluntary. If you choose to take part in the interview, 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.

Risks
The risks to 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 question.

Benefits
The benefit in taking part is that the information you provide to us will be used to improve health care services in the country.

Alternatives to taking part
You have a choice not to take part in this survey.

Confidentiality
We will do everything we can to keep your answers private. 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 survey findings. Only survey staff will have access to the information we collect during the survey.

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

- Staff members from the Institutional Review Boards or Ethics Committees overseeing the conduct of this survey to ensure that we are protecting your rights as a person taking part, including:
  - Swaziland Scientific and Ethics Committee (SEC)
  - The Centers for Disease Control and Prevention (CDC; Atlanta, USA)
  - Columbia University Medical Center
  - Westat (a statistical survey research organization).
- The U.S. Office of Human Research Protections may examine the study records to ensure we are protecting your rights as a person taking part in this survey.
- Selected survey staff and survey monitors.

This survey has received approval from the Swaziland Scientific and Ethics Committee (SEC), The Centers for Disease Control and Prevention, and the Institutional Review Board of Columbia University Medical Center, and of Westat.

If you have any questions about the survey or feel that you have been harmed by taking part, you can contact:

Zandile Mnisi
Address: Ministry of Health, PO Box 5, Mbabane, Swaziland.
Office Phone: +268 2404 4905 Mobile Phone: +268 7872 1846
Email: zandimnisi@gmail.com

If you have any questions about your rights as a person taking part in this survey you can contact:

Babazile Shongwe
Address: Swaziland Scientific and Ethics Committee, P.O Box 5, Mbabane, Swaziland
Office Phone: +268 2404 0865 Mobile Phone: +268 7872 1863
Email: babazileshongwe@gmail.com

Do you want to ask me anything about the survey?

Consent Statement

I have read this form or someone has read it to me. I was encouraged to ask questions and given time to ask questions. Any questions that I had have been answered satisfactorily. I agree to take part in the household interview. I know that after choosing to be in the interview, I may withdraw at any time. My taking part is voluntary. I have been offered a copy of this consent form.

Make your signature or mark if you agree to do the household interview

Head of household signature or mark_____ Date: ___/___/___

Printed name of head of household_____

Household Listing ID number _____

[For participants who cannot read and/or write]

Signature of witness_____ Date: ___/___/___

Printed name of witness_____

Signature of person obtaining consent_____ _____ Date: ___/___/___

Printed name of person obtaining consent_____

Survey staff SHIMS ID number _____

Consent for Interview and Blood Testing: Adults

Interviewer reads:

Hello. My name is_____. I would like to invite you to take part in this survey about HIV in Swaziland. The Government of Swaziland is leading this survey in partnership with the United States Centers for Disease Control and Prevention and ICAP at Columbia University.

What language do you prefer for our discussion today?

___siSwati ___ English

Title of Survey: This survey is called the **Swaziland HIV Incidence Measurement Survey** (SHIMS 2, 2016)

Purpose of the survey

This survey will help us to know how many people in Swaziland are living with HIV and need health services. It will also tell us about people's risk for HIV and who has been infected recently. We will approach about 20,000 men, women, and children from about 6,000 households throughout Swaziland to take part in this survey. We would like to invite you to join the survey too, even if you already know your HIV status. Your taking part will help the Ministry of Health make health services better 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

If you join this survey, we will ask you questions and your answers will be kept between us. The questions will be about your age, what kind of work you do, whether you have had any experience with health services, and your social and sexual behavior. The interview will take about 45 minutes.

The information is collected on this tablet. The information is stored securely and can only be accessed by selected survey staff. The interview will take place in private here in your house or an area around your house.

Survey procedures also include blood draw, HIV test, 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 survey staff member who has been trained to draw blood, will take about 14 millilitres (less than 1 tablespoon) 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. We will give you the results of your HIV test and provide counseling on the same day.

For adults who test positive for HIV and some randomly selected adults without HIV, we will measure the amount of CD4 cells in your blood. CD4 cells help your body fight HIV infection and other diseases. If you are HIV positive, we will give you a referral form and information so that you can consult with a doctor or nurse to learn more about the test result and your health.

Consent for Interview and Blood Testing: Adults

If you test positive for HIV, we will send your blood to a laboratory to measure your viral load. Viral load is the amount of HIV in your blood. The results will be sent to a health facility of your choosing in about 6-8 weeks from now. You will be able to talk to a nurse or doctor at that facility about your viral load. Some of your blood will be sent to a laboratory out of the country for some additional tests related to HIV because there are no laboratories in Swaziland that can do the tests. If we have test results that might help guide your treatment, and 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.

Additionally, we will ask you to take part in possible future research if you want to. If you agree, your contact information will be retained by approved researchers and you may be contacted for a period of up to 5 years and invited to take part in future research, if you still want to. If you do not agree to take part in future research you can still continue to take part in the research today.

We would also like your consent to store your leftover blood for future research tests. These tests may be about HIV, or other health issues important for the health of people living in Swaziland. This sample will be stored for 5-10 years. The sample will not have your name on it and so we will not be able to tell you the results of the future research tests. Your leftover blood will not be sold or used for commercial reasons. If you do not agree to long-term storage of your blood samples, you can still take part in the survey today and we will destroy your blood samples after survey-related testing has been completed.

Conditions of the study: Taking part in the survey is voluntary and you will not be given money or gifts for your taking part. You can leave the survey at any time for any reason. If you decide to leave the survey, no more information will be collected from you. However, we will not be able to take back the information that has already been collected and used within the survey.

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

Use of survey findings

The overall survey findings, which will not contain any personal information that would identify you, will be shared with the Government of the Kingdom of Swaziland and the Ministry of Health. This information will be used to improve the health care for the people of Swaziland. Finally, the findings will be shared with international partners to assist in the delivery of health services all over the world.

Right to refuse or withdraw

You do not have to take part in the survey interview or give blood and you are free to change your mind even after you have started the interview and/or the blood draw. If some of the questions make you feel

uncomfortable you may decide not to answer or you may skip them and move to the next question. You may agree to let us test your blood for HIV, CD4 counts, and other lab testing but not agree to have your blood stored for future research tests. Your taking part is voluntary. If you decide not to take part, it will not affect your healthcare in any way.

Risks

The risks involved with taking part in the survey are small. We will do everything we can to keep your information private. However, we cannot promise complete confidentiality. 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 very small. They include brief pain from the needle stick, bruising, lightheadedness, bleeding and rarely, infection where the needle enters the skin. The survey staff member who will take your blood has received training on how to draw blood. If you experience any discomfort or any of the symptoms mentioned above, please let us know, and especially if there is any bleeding or swelling.

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

Benefits

The main benefit for you to be in the survey is the chance to learn more about your health today. Some people who take part will test HIV positive. If you test HIV positive, the benefit is that 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. 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 already know that you are HIV positive and you are on HIV treatment, the CD4 and 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 research could help us learn more about HIV in Swaziland. It can also help us learn about how HIV prevention and treatment programs are working in the country. Your taking part is important, and you are invited to participate even if you already know that you are HIV negative or positive.

Confidentiality

We will do everything we can to keep your taking part in the survey and your answers private. The information we collect from you will be identified by a number and not by your name. The information entered into the tablet will be identified only by the number. Your name will not appear when we share survey results. Only survey staff will have access to the data during the survey.

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

- Staff members from the Institutional Review Boards or Ethics Committees which oversee the conduct of this survey to ensure that we are protecting your rights as a person taking part, the staff members include:
    - Swaziland Scientific and Ethics Committee (SEC)
    - The Centers for Disease Control and Prevention (CDC; Atlanta, USA)
    - Columbia University Medical Center
    - Westat (a statistical survey research organization).
    - The U.S. Office of Human Research Protections may examine the study records to ensure we are protecting your rights as a person taking part in this survey.
    - Selected survey staff and survey monitors.

This survey has received approval from the Swaziland Scientific and Ethics Committee (SEC), The Centers for Disease Control and Prevention, and the Institutional Review Boards of Columbia University Medical Center, and of Westat.

The information we collect during the survey will not be released outside of the survey groups listed above unless there is an issue of safety. Your permission to allow us to use and share your name and contact information with the groups above will expire five years after the end of the survey. You can leave the survey at any time for any reason. If you want to leave the survey or if you have any questions about the survey or feel that you have been harmed by taking part, you can contact:

Zandile Mnisi
Address: Ministry of Health, PO Box 5, Mbabane, Swaziland.
Office Phone: +268 2404 4905 Mobile Phone: +268 7872 1846
Email: zandimnisi@gmail.com

If you have any questions about your rights as a person taking part in this survey you can contact:

Babazile Shongwe
Address: Swaziland Scientific and Ethics Committee, P.O Box 5, Mbabane, Swaziland
Office Phone: +268 2404 0865 Mobile Phone: +268 7872 1863
Email: babazileshongwe@gmail.com

Do you want to ask me anything about the survey?

Consent Statement

I have read this form and/or someone has read it to me. I was encouraged to ask questions and given time to ask questions. Any questions that I had were answered satisfactorily. I agree to be in this survey. I know that after choosing to be in this survey, I may withdraw at any time. My taking part is voluntary. I have been offered a copy of this consent form.

1. Make your initial or mark if you agree to take part in the survey interview, 'YES' means that you agree to participate in the survey interview. 'NO' means that you will NOT take part in the survey interview.
   _____Yes _____No
   (If "Yes" proceed to the next question)

2. Make your initial or mark if you agree to give blood for testing, 'YES' means that you agree to give blood for testing. 'NO' means that you will NOT give blood for testing.
   _____Yes _____No
   (If "Yes" proceed to the next question)

3. Make your initial or mark if you agree to be contacted for future research, 'YES' means that you agree to be contacted for future research. 'NO' means that you won't be contacted for future research.
   _____Yes _____No

4. Make your initial or mark if you agree to have your leftover blood stored, 'YES' means that you agree to have these blood samples stored. 'NO' means that these blood samples will NOT be stored.
   _____Yes _____No

[Tablet summary statement]
To confirm, you have agreed to <INSERT ALL OPTIONS MARKED YES: INTERVIEW, BLOOD TESTING, FUTURE RESEARCH, BLOOD STORAGE>, is this correct? _____Yes _____No

Participant signature or mark_____ Date: ___/___/___

Printed name of participant_____

[For participants who cannot read and/or write]

Signature of witness_____ Date: ___/___/___

Printed name of witness_____

Signature of person obtaining consent_____ Date: ___/___/___

Printed name of person obtaining consent_____

Survey staff SHIMS ID number _____

Parent Permission to Interview and Blood Draw

Interviewer reads:
Now I would like to ask you to let <INSERT NAME OF CHILD 0-17 YEARS FROM HOUSEHOLD LISTING> take part in the survey.

What language do you prefer for our discussion today?

___SiSwati

___ English

Title of Survey: This survey is called the **Swaziland HIV Incidence Measurement Survey** (SHIMS 2, 2016)

Purpose of the survey
This survey will help us learn more about the health of children in Swaziland. We plan to ask about four thousand children like him/her to join this survey. We would like to invite him/her to join the survey too, even if his/her HIV status is already known. His/her taking part will help the Ministry of Health make health services better in the country.

Survey Procedures
[For children ages <18 months old]
We would like to test your child for HIV. We are doing this for all children in the survey regardless of their parent or guardian's HIV status. A survey staff member, who has been trained to draw blood, will take about 5 to 10 drops of blood from your child's heel into a small tube. The blood will be used to perform a test here today to assess whether your child has been exposed to HIV. We will also place a few drops of blood onto a card which will be sent to the National Laboratory in Mbabane. If your child has been exposed to HIV, the National Laboratory in Mbabane will do a special test appropriate for children younger than 18 months old, to confirm if he/she has the HIV infection. If you provide us with the name of a health facility, we can send the result there in about 6-8 weeks from now. We will also contact you to inform you that the results have been sent to the facility, if you provide us with your contact information. You will be able to talk to a doctor or nurse at the facility about the test result.

If your child tests positive for HIV, we will also send his/her blood to a laboratory for more tests. One of these tests will be to measure his/her viral load. Viral load is the amount of HIV in the blood. If you provide us with the name of a health facility, we can send your child's viral load results there in about 6-8 weeks from now. Some of your child's blood will be sent to a laboratory out of the country for some additional tests related to HIV because there are no laboratories in Swaziland that can do the tests. If we have test results that might guide your child's care or treatment, we will contact you to tell you how you and your child's doctor or nurse may get these results.

We would like to ask your permission to store your child'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 Swaziland. This sample will be stored for 5-10 years. The sample will not have your child's name on it and so we will not be able to tell you the results of the future research tests. Your child's leftover blood samples will not be sold or used for commercial reasons. If you do not agree to long-term storage of your child's blood samples, your child can still take part in the survey. We will destroy your child's blood samples after survey-related testing has been completed.

Additionally, we would like to ask your permission for your child to take part in possible future research if you want to. If you agree, your child's contact information will be retained by approved researchers and you may be contacted for a period of up to 5 years and invited to take part in future research, if you still want to. If you do not agree to take part in future research you can still continue to take part in the research today.

[For children ages 18 months – 24 months old]
We would like to test your child for HIV. We are doing this for all children in the survey regardless of their parent or guardian's HIV status. A survey staff member, who has been trained to draw blood, will take about 5 to 10 drops of blood from your child's heel into a small tube and perform an HIV test here in your home. We will give you the results and provide counseling about the results on the same day as the test. We will also discuss with you how to share the results with your child if you decide to discuss the results with him/her. The entire testing and counseling session will take about 45 minutes.

For all children who test positive for HIV and some randomly selected children without HIV, we will also test the amount of CD4 cells in his/her blood and give you the result on the same day as the test. CD4 cells are the part of your immune system that fights HIV infection and other diseases. We will give you a referral form and information so that you can consult with a doctor or nurse to learn more about your child's HIV test, CD4 counts, and health.

We will also send his/her blood to a laboratory for more tests. One of these tests will be to measure his/her viral load. Viral load is the amount of HIV in the blood. If you provide us with the name of a health facility, we can send your child's viral load results there in about 6-8 weeks from now. Some of your child's blood will be sent to a laboratory out of the country for some additional tests related to HIV because there are no laboratories in Swaziland that can do the tests. If we have test results that might guide your child's care or treatment, we will contact you to tell you how you and your child's doctor or nurse may get these results.

We would like to ask your permission to store your child'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 Swaziland. This sample will be stored for 5-10 years. The sample will not have your child's name on it and so we will not be able to tell you the results of the future research tests. Your child's leftover blood samples will not be sold or used for commercial reasons. If you do not agree to long-term storage of

your child's blood samples, your child can still take part in the survey. We will destroy your child's blood samples after survey-related testing has been completed.

Additionally, we would like to ask your permission for your child to take part in possible future research if you want to. If you agree, your child's contact information will be retained by approved researchers and you may be contacted for a period of up to 5 years and invited to take part in future research, if you still want to. If you do not agree to take part in future research you can still continue to take part in the research today.

[For children ages 25 months -9 years old]

We would like to test your child for HIV. We are doing this for all children in the survey regardless of their parent or guardian's HIV status. A survey staff member, who has been trained to draw blood, will take about 6 millilitres of blood (a little over a teaspoonful) from your child's arm into two tubes and perform an HIV test here in your home. If it is not possible to take blood from your child's arm, then we will take a few drops of blood from your child's finger and then perform the HIV test here in your home. We will give you the results and provide counseling about the results on the same day as the test. We will also discuss with you how to share the results with your child if you decide to discuss the results with him/her. If you would like, we can discuss the test results together with your child. The entire testing and counseling session will take about 45 minutes.

For all children who test positive for HIV and some randomly selected children without HIV, we will also test the amount of CD4 cells in his/her blood and give you the result on the same day as the test. CD4 cells are the part of your immune system that fights HIV infection and other diseases. We will give you a referral form and information so that you can consult with a doctor or nurse to learn more about your child's HIV test, CD4 counts, and health.

We will also send his/her blood to a laboratory for more tests. One of these tests will be to measure his/her viral load. Viral load is the amount of HIV in the blood. If you provide us with the name of a health facility, we can send your child's viral load results there in about 6-8 weeks from now. Some of your child's blood may be sent to a laboratory out of the country for some additional tests related to HIV because there are no laboratories in Swaziland that can do the tests. If we have test results that might guide your child's care or treatment, we will contact you to tell you how you and your child's doctor or nurse may get these results.

We would like to ask your permission to store your child'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 Swaziland. This sample will be stored for 5-10 years. The sample will not have your child's name on it and so we will not be able to tell you the results of the future research tests. Your child's leftover blood samples will not be sold or used for commercial reasons. If you do not agree to long term storage of your child's blood samples, your child can still take part in the survey. We will destroy your child's blood samples after survey-related testing has been completed.

Additionally, we would like to ask your permission for your child to take part in possible future research if you want to. If you agree, your child's contact information will be retained by approved researchers and you may be contacted for a period of up to 5 years and invited to take part in future research, if you still want to. If you do not agree to take part in future research you can still continue to take part in the research today.

[For children ages 10-14 years old]
If both you and your child agree for him/her to join the survey, we will ask your child some questions. The interview will be conducted in private with only the child and a survey staff member. The interview will include questions about education, HIV prevention and treatment, social behavior, and his/her experiences in the household. It will take about 45 minutes.

We would like to test your child for HIV. We are doing this for all children in the survey, whether they are sexually active or not. We will test all children regardless of their parent or guardian's HIV status. A survey staff member, who has been trained to draw blood, will take about 6 millilitres of blood (a little over a teaspoonful) from your child's arm into two tubes and perform an HIV test here in your home. If it is not possible to take blood from your child's arm, then we will try to take a few drops of blood from your child's finger and then perform the HIV test here in your home. We will give you the results and provide counseling about the results on the same day as the test. We will also discuss with you how to share the results with your child if you decide to discuss the results with him/her. If you would like, we can discuss the test results together with your child. The entire testing and counseling session will take about 45 minutes.

For all children who test positive for HIV and some randomly selected children without HIV, we will also test the amount of CD4 cells in his/her blood and give you the result on the same day as the test. CD4 cells are the part of your immune system that fights HIV infection and other diseases. We will give you a referral form and information so that you can consult with a doctor or nurse to learn more about your child's HIV test, CD4 counts, and health.

We will also send his/her blood to a laboratory for other tests. One of these tests will be to measure his/her viral load. Viral load is the amount of HIV in the blood. If you provide us with the name of a health facility, we can send your child's viral load results there in about 6-8 weeks from now. Some of your child's blood may be sent to a laboratory out of the country for some additional tests related to HIV because there are no laboratories in Swaziland that can do the tests. If we have test results that might guide your child's care or treatment, we will contact you to tell you how you and your child's doctor or nurse may get these results.

We would like to ask you and your child's permission to store your child'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 Swaziland. This sample will be stored for 5-10 years. The sample will not have your child's name on it and so we will not be able to tell you the results of the future research tests. Your child's leftover

blood samples will not be sold or used for commercial reasons. If you do not agree to long term storage of your child's blood samples, your child can still take part in the survey. We will destroy your child's blood samples after survey-related testing has been completed.

Additionally, we would like to ask your permission for your child to take part in possible future research if you want to. If both you and your child agree, your child's contact information will be retained by approved researchers and you may be contacted for a period of up to 5 years and invited to take part in future research, if you still want to. If you do not agree to take part in future research you can still continue to take part in the research today.

[Children 15-17 years old]
If both you and your child agree for him/her to join the survey, we will ask your child some questions. The interview will be conducted in private with only the child and a survey staff member. The interview questions will be the same as the ones that we ask adults who agree to take part in the survey. The questions will be about what kind of work they do, whether they have had any experience with health services, and their social and sexual behaviors. It will take about 45 minutes.

We would like to test your child for HIV. We are doing this for all children in the survey, whether they are sexually active or not. We will test all children regardless of their parent or guardian's HIV status. A survey staff member, who has been trained to draw blood, will take about 14 millilitres of blood (less than 1 tablespoonful) from your child's arm into two tubes and perform an HIV test here in your home. If it is not possible to take blood from your child's arm, then we will try to take a few drops of blood from your child's finger and then perform the HIV test here in your home. We will give the results to your child and provide counseling about the results on the same day as the test. We will also discuss with him/her how to share the results with you if he/she decides to discuss the results with you. The entire testing and counseling session will take about 45 minutes.

For all children who test positive for HIV and some randomly selected children without HIV, we will also test the amount of CD4 cells in his/her blood and give your child the result on the same day as the test. CD4 cells are the part of his/her immune system that fights HIV infection and other diseases. We will give him/her a referral form and information so that he/she can consult with a doctor or nurse to learn more about his/her HIV test, CD4 counts, and health.

We will also send his/her blood to a laboratory for additional tests. One of these tests is to measure his/her viral load. Viral load is the amount of HIV in the blood. If he/she provides us with the name of a health facility, we can send his/her viral load results there in about 6-8 weeks from now. Some of your child's blood will be sent to a laboratory out of the country for some additional tests related to HIV because there are no laboratories in Swaziland that can do the tests. If we have test results that might guide your child's care or treatment, we will contact him/her to tell him/her how he/she and a doctor or nurse at the preferred health facility may get these results.

We would like to ask you and your child's permission to store your child'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 Swaziland. This sample will be stored for 5-10 years. The sample will not have your child's name on it and so we will not be able to tell you the results of the future research tests. Your child's leftover blood samples will not be sold or used for commercial reasons. If you do not agree to long term storage of your child's blood samples, your child can still take part in the survey. We will destroy your child's blood samples after survey-related testing has been completed.

Additionally, we would like to ask you and your child's permission for your child to take part in possible future research if you want to. If you agree, your child's contact information will be retained by approved researchers and you may be contacted for a period of up to 5 years and invited to take part in future research, if you still want to. If you do not agree to take part in future research you can still continue to take part in the research today.

Conditions of the study: Taking part in the survey is voluntary and you or your child will not be given money or gifts for taking part. Your child can leave the survey at any time for any reason. If you or your child decides to leave the survey, no more information will be collected from you. However, we 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 or your child for being in the survey, apart from your time.

Use of survey findings

The overall survey findings, which will not contain any personal information that would identify you or your child, will be shared with the Government of the Kingdom of Swaziland and Ministry of Health. This information will be used to improve health care for the people of Swaziland. Finally, the findings will be shared with international partners to assist in the delivery of health services all over the world.

Right to refuse and to withdraw

It is your decision about whether you will allow us to invite your child to join the survey. Your child does not have to be in the survey or give blood. You or your child may stop taking part at any time. If your child is in the age group interviewed and does not want to answer some of the questions he/she may skip them and move to the next question. If your child does not take part, it will not affect your child's healthcare in any way.

You may agree for your child's blood to be tested in relation to this survey, but not agree for the blood to be stored for future research tests. Your child's taking part is voluntary. If you or your child decide not to take part, it will not affect your healthcare in any way.

Risks

[For children 10-17] During the interview, your child may feel uncomfortable answering some of the questions. We do not wish this to happen, and your child does not have to answer questions he/she feels are too personal or that make them feel uncomfortable.

[For all children 0-17] The risks to your child from having his/her blood drawn are very small. They include brief pain from the needle stick, bruising, lightheadedness, bleeding and rarely, infection where the needle enters the skin. The survey staff member who will take his/her blood has received training on how to draw blood. If he/she has any discomfort or any of the symptoms we've mentioned above, please let us know, and especially if there is any bleeding or swelling.

[For children 15-17] Your child may learn that he/she is HIV positive. Learning that he/she has HIV may cause some emotional and/or psychological distress. He/she will receive counseling on how to cope with learning that he/she has HIV. If he/she tests HIV positive, we will help identify where to go and explain the options available for care and treatment. Care and treatment is available at government facilities free of charge.

[For children 18 months -14 years] You may learn that your child is HIV positive. Learning that your child has HIV may cause you some emotional and/or psychological distress. You will decide when and where to give your child the test results. We will provide you with counseling on how to cope with learning that your child has HIV. If your child tests HIV positive, we will help you identify where to go and explain the options available for care and treatment. Care and treatment is available at government facilities free of charge.

Benefits

[For children 0-14] The main benefit for your child to be in the survey is the chance to learn more about his/her health today. If your child tests as part of the survey you will learn his/her HIV status. Some children who take part will test HIV positive. If this happens to your child, the benefit is that you will learn his/her HIV-positive status and you will learn where to take your child for HIV services. HIV care and treatment provided by government facilities is free of charge. If you already know that your child is HIV positive and he/she is on treatment, the CD4 and viral load tests can help your doctor or nurse judge how well the treatment is working. If your child tests HIV negative, you will learn about what you can do to keep your child HIV negative. Your child's taking part in this research could help us learn more about children and HIV in Swaziland. It can also help us learn about how HIV prevention and treatment programs are working in the country. You and your child's taking part is important, even if you already know that your child is HIV negative or positive.

[For children 15-17] The main benefit for your child to be in the survey is the chance for your child to learn more about his/her health today. If your child tests as part of the survey he/she will learn his/her HIV status. Some children who take part will test HIV positive. If this happens to your child, the benefit is that he/she will learn about his/her HIV-positive status and he/she will learn where to go for HIV services. HIV care and treatment provided by government facilities is free of charge. If you or your child

already knows that he/she is HIV positive and he/she is on treatment, the CD4 and viral load tests can help his/her doctor or nurse judge how well the treatment is working. If your child tests HIV negative, your child will learn about what he/she can do to keep himself/herself HIV negative. Your child's taking part in this research could help us learn more about children and HIV in Swaziland. It can also help us learn about how HIV prevention and treatment programs are working in the country. You and your child's taking part is important, even if you already know that your child is HIV negative or positive.

Confidentiality

We will do everything we can to keep your child's taking part in the survey confidential. The information we collect from you and your child in this computer will be identified by a number and not by your name or your child's name. Your child's name and other personal information will be stored in a confidential manner, accessible only by survey staff. Your name and your child's name will not appear when we share survey results. Only survey staff will have access to the data during the survey. However, in accordance with the Children's Protection and Welfare Act, we are required to report any instances of children in imminent danger to the appropriate authority.

[For children 10-17] Your child may choose to tell you about the interview but he/she does not have to do this. We will not be sharing with you responses given by your child.

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

- Staff members from the Institutional Review Boards or Ethics Committees which oversee the conduct of this survey to ensure that we are protecting your rights as a person taking part, the staff members include:
    - Swaziland Scientific and Ethics Committee (SEC)
    - The Centers for Disease Control and Prevention (CDC; Atlanta, USA)
    - Columbia University Medical Center
    - Westat (a statistical survey research organization).
- The U.S. Office of Human Research Protections may examine the study records to ensure we are protecting your rights as a person taking part in this survey.
- Selected survey staff and survey monitors.

This survey has received approval from the Swaziland Scientific and Ethics Committee (SEC), The Centers for Disease Control and Prevention, and the Institutional Review Boards of Columbia University Medical Center, and of Westat.

The information we collect during the survey will not be released outside of the survey groups listed above unless there is an issue of safety. Your permission to allow us to use and share your name and contact information with the groups above will expire five years after the end of the survey. You can leave the survey at any time for any reason. If you want to leave the survey or if you have any questions about the survey or feel that you have been harmed by taking part, you can contact:

Zandile Mnisi
Address: Ministry of Health, PO Box 5, Mbabane, Swaziland.
Office Phone: +268 2404 4905 Mobile Phone: +268 7872 1846
Email: zandimnisi@gmail.com

If you have any questions about your rights as a person taking part in this survey you can contact:

Babazile Shongwe
Address: Swaziland Scientific and Ethics Committee, P.O Box 5, Mbabane, Swaziland
Office Phone: +268 2404 0865 Mobile Phone: +268 7872 1863
Email: babazileshongwe@gmail.com

Do you want to ask me anything about the survey?

Consent Statement

I have read this form, and someone has read it to me. I was encouraged to ask questions and given time to ask questions. Any questions that I had were answered satisfactorily. I agree for my child to take part in this survey. I know that after allowing my child to take part I may change my mind and withdraw him/her from taking part in this survey at any time. I have been offered a copy of this consent form.

[For children 10-17] I agree to allow you to ask my child to be in this survey. I know that after allowing my child to decide whether he/she wants to be in this survey, he/she may withdraw at any time. His/her taking part is voluntary.

[For children 0-10] I agree for my child to be in this survey. I know that after allowing my child to be in this survey, I may withdraw him/her at any time. Taking part is voluntary.

1. **[For children 10-17]** Make your initial or mark if you agree that we can approach your child to ask that he/she do the interview, 'YES' means that you give your permission to have the survey staff ask your child to take part in the interview, and to participate if the child agrees. 'NO' means that you will NOT give permission for your child to be interviewed.
   _____Yes _____No
   (If "Yes" proceed to the next question)

2. **[For children 10-17 years]** Make your initial or mark if you agree that we can approach your child to give blood for HIV testing and related testing, 'YES' means that you give your permission to have the trained survey staff to ask your child to collect a sample of your child's blood for HIV and related testing, and to collect the blood and perform the tests if the child agrees. 'NO' means that your child will NOT give blood for HIV testing and related testing.
   _____Yes _____No
   (If "Yes" proceed to the next question)

3. **[For children 0-9 years]** Make your initial or mark if you agree that your child give blood for HIV testing and related testing, 'YES' means that you give your permission to have the trained survey staff collect a sample of your child's blood for HIV and related testing. 'NO' means that your child will NOT give blood for HIV testing and related testing.

   _____Yes _____No

   (If "Yes" proceed to the next question)

4. **[For children 10-17 years]** Make your initial or mark if you agree to allow us to ask your child to have his/her leftover blood stored for future research, 'YES' means that you give permission for us to ask your child to allow us store leftover blood samples for future research, and to store it if the child agrees. 'NO' means that your child's blood samples will NOT be stored for future research.

   _____Yes _____No

5. **[For children 0-9 years]** Make your initial or mark if you agree to have your child's leftover blood stored for future research, 'YES' means that you give permission for your child's leftover blood samples to be stored for future research. 'NO' means that your child's blood samples will NOT be stored for future research.

   _____Yes _____No

Parent Permission to Interview and Blood Draw

6. **[For children 10-17 years]** Make your initial or mark if you agree to allow us to ask your child to retain his/her contact information for future research, 'YES' means that you give permission for us to ask your child to allow us to retain his/her contact information for future research, and to retain the information if the child agrees. 'NO' means that your child's contact information will NOT be retained for future research.

   _____Yes _____No

7. **[For children 0-9 years]** Make your initial or mark if you agree to have your child's contact information retained for future research, 'YES' means that you give permission for your child's contact information to be retained for future research. 'NO' means that your child's contact information will NOT be retained for future research.

   _____Yes _____No

To confirm, you have agreed to <INSERT ALL OPTIONS MARKED YES: APPROACH CHILD FOR INTERVIEW, APPROACH CHILD FOR BLOOD TESTING, CHILD INTERVIEW, CHILD BLOOD TEST, APPROACH CHILD FOR BLOOD STORAGE, CHILD BLOOD STORAGE, APPROACH CHILD FOR STORAGE CONTACT INFORMATION, CHILD CONTACT INFORMATION STORAGE>, is this correct? _____Yes _____No

Parent/guardian signature or mark_____ Date: ___/___/___

Printed name of parent/guardian_____

[For illiterate participants]

Signature of witness_____ Date: ___/___/___

Printed name of witness_____

Signature of person obtaining consent_____ Date: ___/___/___

Printed name of person obtaining consent_____

Survey staff ID number _____

Child's name (print) _____

Child's participant ID number _____

Adolescent Assent for Interview and Blood Draw

What language do you prefer for our discussion today? ___siSwati ___ English

Title of Survey: This survey is called the **Swaziland HIV Incidence Measurement Survey** (SHIMS 2, 2016)

Interviewer reads:

Hello. My name is_____. I would like to invite you to take part in a research survey. Surveys help us learn new things. As a part of this research survey, we are asking people questions about themselves and also giving people a chance to learn if they have HIV. We are inviting people to participate even if they already know they have HIV or they don't. We are also asking people if we can keep some of their blood for future testing.

This form talks about our survey and the choice that you have to take part in it. We want you to ask us any questions that you have. You can ask questions any time.

Why are we doing this survey?
We are doing this survey to help us learn more about the health of children in Swaziland. We plan to ask thousands of children like you to join this survey. A survey is a way to learn about something by interviewing and testing many people. We would like to invite you to join this survey.

[Exclude for child with special circumstances]
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 survey?
If you decide to join the survey, here is what would happen:

- We will ask you questions about your age, what you know about HIV, and whether you have experience with behavior that may put you at risk of HIV.
- The interview will take place in private here in your house or an area around your house.
- The interview will take about 45 minutes.
- After we ask you the questions, if you have agreed, we will take some of your blood to test for HIV and to store for future research tests.
- **[Children 10-14]** We will use a needle to take about 6 millilitres of blood (a little over a teaspoonful) from your arm into two tubes. If it's not possible to take blood from your arm,

then we will try to take a few drops of blood from your finger. Then we will test your blood for HIV here in your home.

- **[Children 15-17]** We will use a needle to take about 14 millilitres of blood (less than a tablespoonful) from your arm into two tubes. If it's not possible to take blood from your arm, then we will try to take a few drops of blood from your finger. Then we will test your blood for HIV here in your home.
- It will take about 45 minutes to do the test and to talk to you about the results.
- If you have HIV, we will measure how well your body can fight HIV and other infections. We can do this test here in your home. We will also measure this in the blood of some people without HIV. This is known as CD4+.
- If you test positive for HIV, we will send your blood to the National Laboratory in Mbabane to measure the amount of HIV in your blood. Some of your blood will be sent to a laboratory out of the country for some additional tests related to HIV because there are no laboratories in Swaziland that can do these tests.
- You may be eligible to take part in future studies related to health in Swaziland. 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 we contact you, we will give you details about the new study and ask you to sign a separate assent/consent form at that time. 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 survey.
- 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 Swaziland. This sample will be stored for 5-10 years. Your leftover blood will not be used for anything other than these tests. Your blood will not be sold. If you do not agree to future storage and testing of your blood, we will destroy your blood after survey related testing has finished and you can still receive your test results and conduct the survey interview.

Could bad things happen if you join this survey?

You may feel uncomfortable answering some of the questions we will ask. You can refuse to answer any question at any time and we will stop.

The needle may hurt when it is put into and taken out of 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 afterwards. Rarely, an infection might occur where the needle enters the skin. We may have to try more than one time in order to get the right amount of blood. We will do our best to make it as painless as possible.

We will test for HIV and you may learn that you have HIV. Learning that you have HIV may cause you to feel worried. We will talk to you to support you through this situation. What we talk about we will not tell anyone else but there is a small chance other people might find out.

Could the survey help me?
You may not get anything yourself by being in the survey. But you may help us figure out ways to help other children and learn more about HIV in Swaziland. Your taking part is important, even if you already know that you have HIV or you don't have HIV.

[For children 10-14 years]
Being in the survey may help you by learning whether or not you have HIV. We would give your results to your parent/guardian and you can talk to him/her about your test result. If your parent wants us to tell you about your test results, we would talk with you about any questions that you might have about the results. If you are HIV positive, we will tell your parent/guardian where to take you for your medical care and the Government of Swaziland will pay for your care. We hope to learn about HIV health care needs in this survey. And we hope it will help other children in Swaziland in the future.

[For children with special circumstances 12-14]
Being in the survey may help you by learning whether or not you have HIV. We would give your results to you and help you to share them with a person of your choice who can support you. We would talk with you about any questions that you might have about the results. If you are HIV positive, we will tell you where you can go for your medical care and the Government of Swaziland will pay for your care. We hope to learn about HIV health care needs in this survey. And we hope it will help other children in Swaziland in the future.

[For children 15-17 years]
Being in the survey may help you by learning whether or not you have HIV. We will give you your results of your HIV test and provide counseling to you and discuss with you how to share these results with your parent/guardian, if you decide to. If you test positive for HIV, you will learn about it and you will learn where to go for care and treatment of HIV. Care and treatment provided by the Government of Swaziland is free. If you already know you have HIV and are not on treatment, you will get information to help your doctor/nurse determine if you are ready to start treatment. If you already know that you have HIV and you are on HIV treatment, the tests may help your doctor/nurse judge how well your treatment is working. If you test negative for HIV, you will learn about what you can do to stay that way. Your taking part in this survey is important, even if you already know your HIV status as it will help us learn more about HIV in Swaziland.

Conditions of the study: Taking part in the survey is voluntary and you will not be given money or gifts for your taking part. You can leave the survey at any time for any reason. If you decide to leave the survey, no more information will be collected from you. However, we 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 survey, apart from your time.

Use of survey findings

The overall survey findings, which will not contain any personal information that would identify you, will be shared with the Government of the Kingdom of Swaziland and the Ministry of Health. This information will be used to improve the health care for the people of Swaziland. The findings will also be shared with international partners to assist in the delivery of health services all over the world.

What else should you know about this survey?

If you don't want to be in the survey study, you don't have to be. Nobody will get upset with you if you do not want to join the survey.

It is also OK to say 'Yes' and change your mind later. You can stop being in the survey at any time. If you want to stop, please tell us.

Confidentiality

[For children 15-17, children with special circumstances 12-14] We will do everything we can to keep your test results confidential. The blood 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 survey and people you decide to tell**.**

[For children 10-14] We will do everything we can to keep your test results confidential. The blood we collect from you will be identified by a number, not by your name. Besides you and your guardian/parent, no one else will know your test results except the people working on the survey**.**

We will not tell other people that you are in this survey and will not share information about you to anyone who does not work in the survey. Any information about you will have a number on it instead of your name. Only selected survey staff will have access to the information we collect during the survey.

The following individuals and/or agencies will be able to look at your research records:

- Survey staff collecting data and monitoring data quality.
- Staff members analyzing data within Swaziland and internationally.
- Staff members from groups that protect your rights as a person taking part in a survey who check that we are protecting your rights like the Swaziland Scientific and Ethics Committee (SEC) and similar agencies in the United States of America.

This survey has been approved by committees that protect your rights in Swaziland and internationally.

Is there anything else?

If you want to be to take part in the survey after we finish talking now, please write your name below. We will write our name too. This shows we talked about the survey and that you want to take part.

If you have any questions about the survey or feel that you have been harmed by taking part, you can contact:

Zandile Mnisi
Address: Ministry of Health, PO Box 5, Mbabane, Swaziland.
Office Phone: +268 2404 4905 Mobile Phone: +268 7872 1846
Email: zandimnisi@gmail.com

If you have any questions about your rights as a person taking part in this survey you can contact:

Babazile Shongwe
Address: Swaziland Scientific and Ethics Committee, P.O Box 5, Mbabane, Swaziland
Office Phone: +268 2404 0865 Mobile Phone: +268 7872 1863
Email: babazileshongwe@gmail.com

Do you want to ask me anything about:

- The interview?
- Taking your blood for HIV testing?
- Testing in the laboratory?
- Storage of blood for future research testing?

Assent statement

I have read this form, or someone has read it to me. I was encouraged to ask questions and given time to ask questions. Any questions that I had were answered satisfactorily. I agree to be in this survey. I know that after choosing to be in this survey, I may withdraw at any time. My taking part is voluntary. I have been offered a copy of this consent form.

1. Do you agree to do the interview? 'YES' means that you agree to do the interview. 'NO' means that you will NOT do the interview.
   _____Yes _____No
   (If "Yes" proceed to the next question)

2. **[For children 10-14]** Make your initial or mark if you agree to give blood for testing and have your parent/guardian receive your result, 'YES' means that you agree to give blood for testing. 'NO' means that you will NOT give blood for testing.
   _____Yes _____No
   (If "Yes" proceed to the next question)

3. **[For children 15-17, children with special circumstances 12-14]** Make your initial or mark if you agree to give blood for testing, 'YES' means that you agree to give blood for testing and receive your results. 'NO' means that you will NOT give blood for testing.
   _____Yes _____No
   (If "Yes" proceed to the next question)

4. Make your initial or mark if you agree to have your leftover blood stored, 'YES' means that you agree to have these blood samples stored. 'NO' means that these blood samples will NOT be stored.
   _____Yes _____No

5. Do you agree to be contacted in the future? 'YES' means that you agree to be contacted in the future if a study opportunity arises. 'NO' means that you will NOT be contacted about future studies.
   _____YES _____NO

[Tablet summary statement]
To confirm, you have agreed to <INSERT ALL OPTIONS MARKED YES: INTERVIEW, BLOOD TESTING AND RESULT TO PARENT (10-14YEARS), BLOOD TESTING AND RESULT TO YOU (15-17 YEARS, CHILDREN WITH SPECIAL CIRCUMSTANCES 12-14), CHILD INTERVIEW, FUTURE RESEARCH, BLOOD STORAGE>, is this correct? _____Yes _____No

Child signature or mark_____ Date: ___/___/___

Printed name of child _____

Printed name of parent/guardian_____

[For illiterate participants or parents/guardians]

Signature of witness_____ Date: ___/___/___

Printed name of witness_____

Signature of person obtaining consent_____ _____ Date: ___/___/___

Printed name of person obtaining consent_____

Survey staff ID number _____

Household Interview Consent: Child with Special Circumstances

Title of Survey: This survey is called the **Swaziland HIV Incidence Measurement Survey** (SHIMS 2, 2016)

Interviewer reads:

Hello. My name is_____. I would like to invite you to take part in a research survey. Surveys help us learn new things. As a part of this research survey, we are asking people questions about themselves and also giving people a chance to learn if they have HIV. We are inviting people to participate even if they already know they have HIV or they don't. The Government of the Kingdom of Swaziland is leading this survey, in partnership with the United States government.

What language do you prefer for our discussion today?

___siSwati ___ English

Title of Survey: Swaziland HIV Incidence Measurement Survey (SHIMS 2, 2016)

Purpose of survey
This survey will help us to know how many people in Swaziland are living with HIV and need health services. About 6,000 households will join this survey. We would like your household to join the survey too, even if people in the household already know their HIV status. What you tell us will help make health services better in the country.

This form might have some words that you may not have heard before. Please ask me to explain anything that you do not understand. You can ask questions at any time.

Survey Procedures
If you join this survey, we will ask you questions and your answers will be kept between us. There are two parts to this survey– a household interview and individual interviews. In the household interview, we would like to ask you some questions about the people living in your household. We will ask how many people live here, their relationship to you and to each other, their gender, and age. We will ask you about people who are ill or recently died in your household. We will also ask you about some of the things you have in your household. The household interview will take up to 45 minutes.

After completing the household interview, we would begin the individual interviews. We would like to invite you and others living in your household to take part in the second part of this survey. We will ask each person to give his or her written permission to take part before joining the survey.

Costs for being in the survey: There is no cost to you for being in the household interview, except for your time.

Right to refuse or withdraw
If you don't want to be in the survey study, you don't have to be. Nobody will get upset with you if you do not want to join the survey.
It is also OK to say 'Yes' and change your mind later. You can stop being in the survey at any time. If you want to stop, please tell us.

Risks
The risks to 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 question you do not want to answer.

Benefits
The benefit in taking part is that the information you provide to us will be used to improve health care services in the country.

Alternatives to taking part
You have a choice not to take part in this survey.

Confidentiality
We will not tell other people that you are in this survey and will not share information about you to anyone who does not work in the survey. Any information about you will have a number on it instead of your name. Only selected survey staff will have access to the information we collect during the survey.

The following individuals and/or agencies will be able to look at your research records:

- Survey staff collecting data and monitoring data quality.
- Staff members analyzing data within Swaziland and internationally.
- Staff members from groups that protect your rights as a person taking part in a survey who check that we are protecting your rights like the Swaziland Scientific and Ethics Committee (SEC) and similar agencies in the United States of America.

This survey has been approved by committees that protect your rights in Swaziland and internationally.

If you have any questions about the survey or feel that you have been harmed by taking part, you can contact:

Zandile Mnisi
Address: Ministry of Health, PO Box 5, Mbabane, Swaziland.
Office Phone: +268 2404 4905 Mobile Phone: +268 7872 1846
Email: zandimnisi@gmail.com

If you have any questions about your rights as a person taking part in this survey you can contact:

Babazile Shongwe
Address: Swaziland Scientific and Ethics Committee, P.O Box 5, Mbabane, Swaziland
Office Phone: +268 2404 0865 Mobile Phone: +268 7872 1863
Email: babazileshongwe@gmail.com

Do you want to ask me anything about the survey?

Consent Statement

I have read this form or someone has read it to me. I was encouraged to ask questions and given time to ask questions. Any questions that I had were answered satisfactorily. I agree to take part in the household

Household Interview Consent: Child with Special Circumstances

interview. I know that after choosing to be in the interview, I may withdraw at any time. My taking part is voluntary. I have been offered a copy of this consent form.

Make your signature or mark if you agree to do the household interview

Head of household signature or mark_____ Date: ___/___/___

Printed name of head of household_____

Household Listing ID number _____

[For participants who cannot read and/or write]

Signature of witness_____ Date: ___/___/___

Printed name of witness_____

Signature of person obtaining consent_____ _____ Date: ___/___/___

Printed name of person obtaining consent_____

Survey staff SHIMS ID number _____

Permission to Interview and Blood Draw Children: Child with Special Circumstances

What language do you prefer for our discussion today? ___siSwati ___ English

Title of Survey: This survey is called the **Swaziland HIV Incidence Measurement Survey** (SHIMS 2, 2016)

Interviewer reads:
Now I would like to ask you to let <INSERT NAME OF CHILD 0-17 YEARS FROM HOUSEHOLD LISTING> take part in the survey.

Purpose of the survey
This survey will help us learn more about the health of children in Swaziland. We plan to ask thousands of children like him/her to join this survey. We would like to invite him/her to join the survey too, even if you already know that <INSERT NAME OF CHILD 0-17 YEARS FROM HOUSEHOLD LISTING> is HIV positive or negative. His/her taking part will help the Ministry of Health make health services better in the country.

Why are we doing this survey?
We are doing this survey to help us learn more about the health of children in Swaziland. A survey is a way to learn about something by interviewing and testing many people. We would like to invite your child to join this survey.

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 <INSERT NAME OF **CHILD UNDER 18 months**> **joins this survey?**
If you decide to let this child join the survey, here is what would happen:

- We will take about 5 to 10 drops of blood from his/her heel into a small tube. We shall perform a test here today to check if your child has been exposed to HIV.
- A few drops of blood from the tube will be placed on a card and sent to the National Laboratory in Mbabane for a special test to determine if your child has an HIV infection.
- If he/she tests positive for HIV, we will measure the amount of HIV in his/her blood. Some of his/her blood will be sent to a laboratory out of the country for some additional tests related to HIV because there are no laboratories in Swaziland that can do these tests.
- We will ask you if we can store some of his/her blood for future testing. These tests will help us learn about the health of people in Swaziland. This sample will be stored for 5-10 years. His/her leftover blood will not be used for anything other than these tests. This blood will not be sold. If you do not agree to future storage and testing of his/her blood, your child can still take part in the survey today. After survey related testing and informing you of the result, we will destroy the card which contains his/her blood.

- He/she may be eligible to take part in future studies related to health in Swaziland. We are asking for your permission to contact you in the next five years if such an opportunity occurs. In order to do this, approved researchers will be able to request access to your contact information. If we contact
  you, we will provide details about the new study and ask you to sign a separate consent form at that time. You may decide at that time not 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 survey.

What would happen if <INSERT NAME OF **CHILD 18-24 months**> **joins this survey?**
If you decide to let this child join the survey, here is what would happen:

- We will take about 5 to 10 drops of blood from his/her heel into a small tube. Then we will test his/her blood for HIV here in your home.
- It will take about 30 minutes to do the test and to talk to you about the results.
- If he/she has HIV, we will measure how well his/her body can fight HIV and other infections. We can do this test here in your home. We will also measure this in the blood of some children without HIV. This is known as CD4+.
- If he/she tests positive for HIV, we will send his/her blood to the National Laboratory in Mbabane to measure the amount of HIV in his/her blood. Some of his/her blood will be sent to a laboratory out of the country for some additional tests related to HIV because there are no laboratories in Swaziland that can do these tests.
- We will ask you if we can store some of his/her blood for future testing. These tests will help us learn about the health of people in Swaziland. This sample will be stored for 5-10 years. His/her leftover blood will not be used for anything other than these tests. This blood will not be sold. If you do not agree to future storage and testing of his/her blood, your child can still take part in the survey today. After survey related testing and informing you of the result, we will destroy his/her blood sample.
- He/she may be eligible to take part in future studies related to health in Swaziland. We are asking for your permission to contact you in the next five years if such an opportunity occurs. In order to do this, approved researchers will be able to request access to your contact information. If we contact you, we will provide details about the new study and ask you to sign a separate assent/consent form at that time. You may decide at that time not 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 survey.

What would happen if <INSERT NAME OF **CHILD 25 months -9 YEARS**> **joins this survey?**
If you decide to let this child join the survey, here is what would happen:

- We will use a needle to take about 6 millilitres of blood (a little over a teaspoonful) from his/her arm into two tubes. If it's not possible to take blood from his/her arm, then we will try to take a few drops of blood from his/her finger. Then we will test his/her blood for HIV here in your home.
- It will take about 30 minutes to do the test and to talk to you about the results.
- If he/she has HIV, we will measure how well his/her body can fight HIV and other infections. We can do this test here in your home. We will also measure this in the blood of some children without HIV. This is known as CD4+.
- If he/she tests positive for HIV, we will send his/her blood to the National Laboratory in Mbabane to measure the amount of HIV in his/her blood. Some of his/her blood will be sent to a laboratory out of the country for some additional tests related to HIV because there are no laboratories in Swaziland that can do these tests.
- We will ask you if we can store some of his/her blood for future testing. These tests will help us learn about the health of people in Swaziland. This sample will be stored for 5-10 years. His/her leftover blood will not be used for anything other than these tests. This blood will not be sold. If you do not agree to future storage and testing of his/her blood, your child can still take part in the survey today. After survey related testing and informing you of the result, we will destroy his/her blood sample.
- He/she may be eligible to take part in future studies related to health in Swaziland. We are asking for your permission to contact you in the next five years if such an opportunity occurs. In order to do this, approved researchers will be able to request access to your contact information. If we contact you, we will provide details about the new study and ask you to sign a separate assent/consent form at that time. You may decide at that time not 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 survey.

What would happen if <INSERT NAME OF **CHILD 10-17 YEARS**> **joins this survey?**
If you decide to let this child join the survey, here is what would happen:

- We will ask him/her questions about his/her age, what he/she knows about HIV, and whether he/she has experience with behavior that may put them at risk of HIV.
- The interview will take place in private here in your house or an area around your house.
- The interview will take about 30 minutes.
- After we ask him/her the questions, if he/she has agreed, we will take some of his/her blood to test for HIV and to store for future research surveys.
- **[Children 10-14 years]** We will use a needle to take about 6 millilitres of blood (less than a tablespoonful) from his/her arm into two tubes. If it's not possible to take blood from

his/her arm, then we will try to take a few drops of blood from his/her finger. Then we will test his/her blood for HIV here in your home.

- **[Children 15-17 years]** We will use a needle to take about 14 millilitres of blood (less than a tablespoonful) from his/her arm into two tubes. If it's not possible to take blood from his/her arm, then we will try to take a few drops of blood from his/her finger. Then we will test his/her blood for HIV here in your home.
- **[Children 10-14 years]** It will take about 30 minutes to do the test and to talk to you about the results.
- **[Children 15-17 years]** It will take about 30 minutes to do the test and to talk to him/her about the results.
- If he/she has HIV, we will measure how well his/her body can fight HIV and other infections. We can do this test here in your home. We will also measure this in the blood of some people without HIV. This is known as CD4+.
- If he/she tests positive for HIV, we will send his/her blood to the National Laboratory in Mbabane to measure the amount of HIV in his/her blood. Some of his/her blood will be sent to a laboratory out of the country for some additional tests related to HIV because there are no laboratories in Swaziland that can do these tests.
- We will ask him/her if we can store some of his/her blood for future testing. These tests will help us learn about the health of people in Swaziland. This sample will be stored for 5-10 years. His/her leftover blood will not be used for anything other than these tests. This blood will not be sold. If you or your child do not agree to future storage and testing of his/her blood, your child can still take part in the survey today. After survey related testing and informing you of the result, we will destroy his/her blood sample.
- He/she may be eligible to take part in future studies related to health in Swaziland. We are asking for both your permission and his/her permission to contact you or him/her in the next five years if such an opportunity occurs. In order to do this, approved researchers will be able to request access to your contact information. If we contact you or him/her, we will provide details about the new study and ask you or him/her to sign a separate assent/consent form at that time. You or he/she may decide at that time not to take part in that study. If you or he/she do not wish to be contacted about future studies, it does not affect your taking part in this survey.

Could bad things happen if he/she joins this survey?

[For children 0 to 24 months] The needle may hurt when it is put into and taken out of his/her finger or heel and the child may cry. This pain will go away quickly. Sometimes the needle can leave a bruise on the skin. Very rarely, an infection might occur where the needle enters the skin. We may have to try more than one time in order to get the right amount of blood. We will do our best to make it as painless as possible.

Learning that this child has HIV may cause you to feel worried. We will talk to you to support you through this situation. We will not tell anyone else what we talk about but there is a small chance other people might find out.

[For children 25 months-9 years] The needle may hurt when it is put into and taken out of his/her arm or finger and the child may cry. This pain will go away quickly. Sometimes the needle can leave a bruise on the skin. Rarely, an infection might occur where the needle enters the skin. We may have to try more than one time in order to get the right amount of blood. We will do our best to make it as painless as possible.

Learning that this child has HIV may cause you to feel worried. We will talk to you to support you through this situation. We will not tell anyone else what we talk about but there is a small chance other people might find out.

[For children 10-17] He/she may feel uncomfortable answering some of the questions we will ask. He/she can refuse to answer any question and we will skip that question.

The needle may hurt when it is put into and taken out of his/her arm. This pain will go away quickly. Sometimes the needle can leave a bruise on the skin. He/she might bleed a little or feel a little dizzy afterwards. Rarely, an infection might occur where the needle enters the skin. We may have to try more than one time in order to get the right amount of blood. We will do our best to make it as painless as possible.

We will test for HIV and you and he/she may learn that he/she has HIV. Learning that he/she has HIV may cause you and him/her to feel worried. We will talk to you and him/her and try to make you and him/her understand the situation and how to handle it. We will not tell anyone else what we talk about but there is a small chance other people might find out.

Could the survey help him/her?
He/she may not get anything himself/herself by being in the survey. But he/she may help us figure out ways to help other children and learn more about HIV in Swaziland. His/her taking part is important.

[For children 0-14 years]
Being in the survey may help you by learning whether or not this child has HIV. We would give his/her results to you and you can talk to him/her about his/her test result. If you want to tell him/her about his/her test results, we would talk with you and/or him/her about any questions that you and/or he/she might have about the results. If he/she is HIV positive, we will tell you where to take him/her for his/her medical care and the Government of Swaziland will pay for his/her care. Children can participate in the survey whether it is known that they have HIV or not. We hope to learn about HIV health care needs in this survey. And we hope it will help other children in Swaziland in the future.

[For children 15-17 years]
Being in the survey may help him/her by learning whether or not he/she has HIV. We will give him/her the results of his/her HIV test and provide counseling to him/her and discuss with him/her how to share these results with you, if he/she decides to. If he/she tests positive for HIV, he/she will learn about it and he/she will learn where to go for care and treatment of HIV. Care and treatment provided by the Government of Swaziland is free. If he/she already knows he/she has HIV and are not on treatment, he/she will get information to help his/her doctor/nurse determine if he/she is ready to start treatment. If he/she already knows that he/she has HIV and he/she is on HIV treatment, the tests may help his/her doctor/nurse judge how well his/her treatment is working. If he/she test negative for HIV, he/she will learn about what he/she can do to stay that way. Children can participate in the survey whether it is known that they have HIV or not. His/her taking part in this survey will help us learn more about HIV in Swaziland.

Conditions of the study: Taking part in the survey is voluntary and he/she will not be given money or gifts for his/her taking part. He/she can leave the survey at any time for any reason. If he/she decides to leave the survey, no more information will be collected from him/her. However, we 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 or to him/her for being in the survey, apart from your and his/her time.

Use of survey findings
The overall survey findings, which will not contain any personal information that would identify him/her, will be shared with the Government of the Kingdom of Swaziland and the Ministry of Health. This information will be used to improve the health care for the people of Swaziland. The findings will also be shared with international partners to assist in the delivery of health services all over the world.

What else should you know about this survey?
If you don't want this child to be in the survey, he/she doesn't have to be. Also, if he/she doesn't want to be in the survey, he/she doesn't have to be. Nobody will get upset with you or him/her if he/she doesn't join the survey.

It is also OK to say 'Yes' and change your mind later. You can stop him/her being in the survey at any time. If you want to stop, please tell us.

Confidentiality
[For children 15-17] We will do everything we can to keep his/her test results confidential. The blood we collect from him/her will be identified by a number, not by his/her name. Besides him/her, no one else will know his/her test results except the people working on the survey and people he/she decides to tell**.**

[For children 0-14] We will do everything we can to keep his/her test results confidential. The blood we collect from him/her will be identified by a number, not by his/her name. Besides you and him/her, no one else will know his/her test results except the people working on the survey**.**

We will not tell other people that he/she is in this survey and will not share information about him/her with anyone who does not work in the survey. Any information about him/her will have a number on it instead of his/her name. Only selected survey staff will have access to the information we collect during the survey. However, in accordance with the Children's Protection and Welfare Act, we are required to report any instances of children in imminent danger to the appropriate authority.

The following individuals and/or agencies will be able to look at his/her research records:

- Survey staff collecting data and monitoring data quality.
- Staff members analyzing data within Swaziland and internationally.
- Staff members from groups that protect your rights as a person taking part in a survey who check that we are protecting your rights like the Swaziland Scientific and Ethics Committee (SEC) and similar agencies in the United States of America.

This survey has been approved by committees that protect your rights in Swaziland and internationally.

Is there anything else?

If you want this child to take part in this survey after we finish talking now, please write your name below. We will write our name too. This shows we talked about the survey and that you allow <INSERT NAME OF CHILD 0-17 YEARS FROM HOUSEHOLD LISTING> to take part.

If you have any questions about the survey or feel that you or this child have been harmed by taking part, you can contact:

Zandile Mnisi
Address: Ministry of Health, PO Box 5, Mbabane, Swaziland.
Office Phone: +268 2404 4905 Mobile Phone: +268 7872 1846
Email: zandimnisi@gmail.com

If you have any questions about your rights as a person taking part in this survey you can contact:

Babazile Shongwe
Address: Swaziland Scientific and Ethics Committee, P.O Box 5, Mbabane, Swaziland
Office Phone: +268 2404 0865 Mobile Phone: +268 7872 1863
Email: babazileshongwe@gmail.com

Do you want to ask me anything about:

- **[Children 10-17 years]** The interview?
- Drawing blood for HIV testing?
- Testing in the laboratory?
- Storage of blood for future research testing?

Assent statement

I have read this form, or someone has read it to me. I was encouraged to ask questions and given time to ask questions. Any questions that I had were answered satisfactorily. I agree for this child to be in this survey. I know that after allowing this child to be in this survey, I may withdraw this child at any time. This child's taking part is voluntary. I have been offered a copy of this consent form.

1. **[For children 10-17]** Make your initial or mark if you agree that we can approach your child to ask that he/she do the interview, 'YES' means that you give your permission to have the survey staff ask your child to take part in the interview, and to participate if the child agrees. 'NO' means that you will NOT give permission for your child to be interviewed.
   _____Yes _____No
   (If "Yes" proceed to the next question)

2. **[For children 10-17 years]** Make your initial or mark if you agree that we can approach your child to give blood for HIV testing and related testing, 'YES' means that you give your permission to have the trained survey staff to ask your child to collect a sample of your child's blood for HIV and related testing, and to collect the blood and perform the tests if the child agrees. 'NO' means that your child will NOT give blood for HIV testing and related testing.
   _____Yes _____No

   (If "Yes" proceed to the next question)

3. **[For children 0-9 years]** Make your initial or mark if you agree that your child give blood for HIV testing and related testing, 'YES' means that you give your permission to have the trained survey staff collect a sample of your child's blood for HIV and related testing. 'NO' means that your child will NOT give blood for HIV testing and related testing.
   _____Yes _____No
   (If "Yes" proceed to the next question)

4. **[For children 10-17 years]** Make your initial or mark if you agree to allow us to ask your child to have his/her leftover blood stored for future research, 'YES' means that you give permission for us to ask your child to allow us store leftover blood samples for future research, and to store it if the child agrees. 'NO' means that your child's blood samples will NOT be stored for future research.
   _____Yes _____No

5. **[For children 0-9 years]** Make your initial or mark if you agree to have your child's leftover blood stored for future research, 'YES' means that you give permission for your child's leftover blood samples to be stored for future research. 'NO' means that your child's blood samples will NOT be stored for future research.
   _____Yes _____No

6. **[For children 10-17 years]** Make your initial or mark if you agree to allow us to ask your child to retain his/her contact information for future research, 'YES' means that you give permission for us to ask your child to allow us to retain his/her contact information for future research, and to retain the information if the child agrees. 'NO' means that your child's contact information will NOT be retained for future research.
   _____Yes _____No

7. **[For children 0-9 years]** Make your initial or mark if you agree to have your child's contact information retained for future research, 'YES' means that you give permission for your child's contact information to be retained for future research. 'NO' means that your child's contact information will NOT be retained for future research.
   _____Yes _____No

To confirm, you have agreed to <INSERT ALL OPTIONS MARKED YES: APPROACH CHILD FOR INTERVIEW, APPROACH CHILD FOR BLOOD TESTING, CHILD INTERVIEW, CHILD BLOOD TEST, APPROACH CHILD FOR BLOOD STORAGE, CHILD BLOOD STORAGE>, is this correct? _____Yes _____No

Child with special circumstances signature or mark_____ Date: ___/___/___

Printed name of child with special circumstances _____

[For illiterate participants or parents/guardians]

Signature of witness_____ Date: ___/___/___

Printed name of witness_____

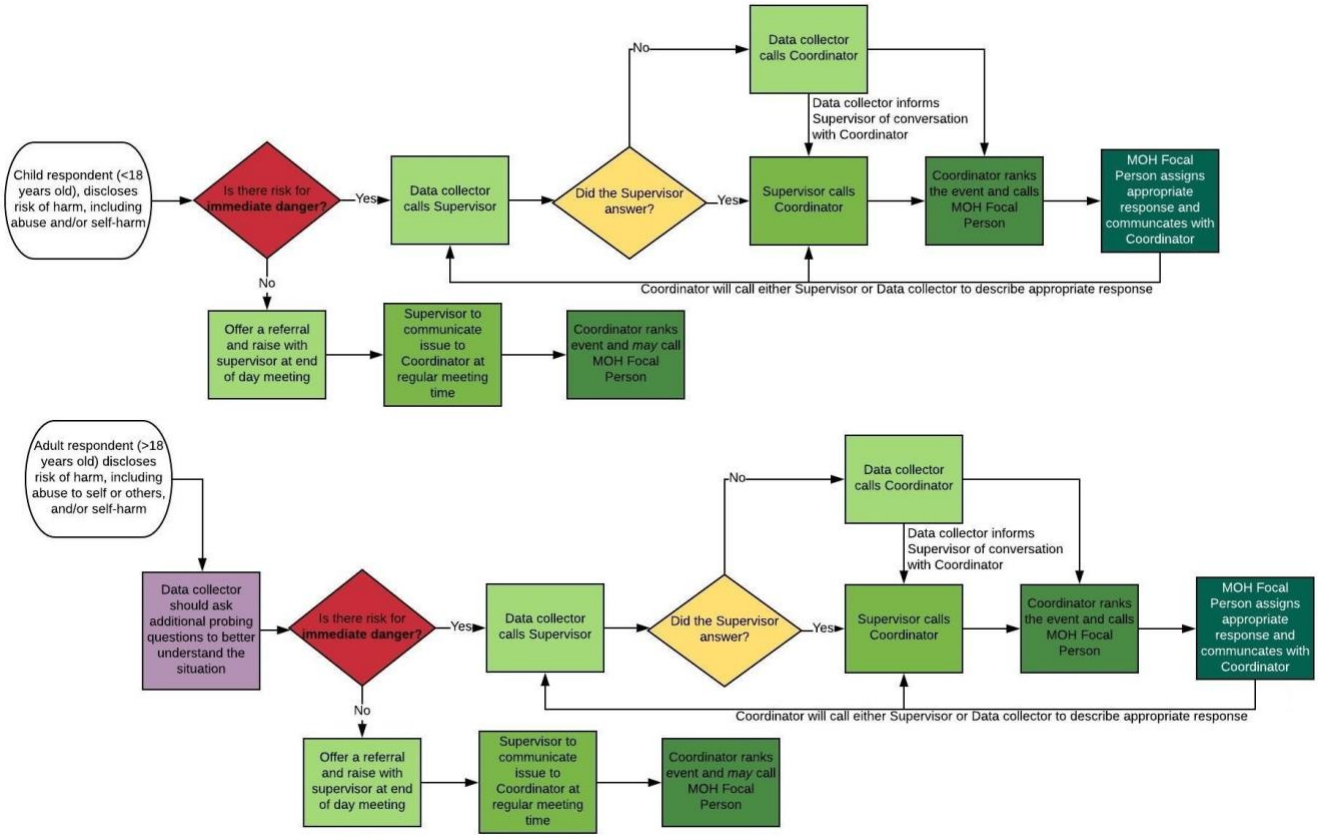
Signature of person obtaining consent_____ _____ Date: ___/___/___

Printed name of person obtaining consent_____

Survey staff ID number _____

APPENDIX I SAFEGUARDING AND REFERRAL PATHWAY

Safeguarding and Referral Pathway for SHIMS2 2016-2017



This project is supported by the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) through CDC under the terms of cooperative agreements #U2GGH001271 and #U2GGH001226. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the funding agencies.