Malawi Population-based HIV Impact Assessment 2020-2021

MPHIA 2020-2021

FINAL REPORT

NOVEMBER 2022

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Malawi Population-based HIV Impact Assessment
MPHIA 2020-2021

MPHIA 2020-2021 COLLABORATING INSTITUTIONS

- Ministry of Health
- National AIDS Commission
- The United States (US) President's Emergency Plan for AIDS Relief (PEPFAR)
- The US Centers for Disease Control and Prevention (CDC)
- WESTAT
- ICAP at Columbia University

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GLOSSARY OF TERMS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
ART	Antiretroviral Therapy
ARV	Antiretroviral
CDC	US Centers for Disease Control and Prevention
CD4	CD4+ T Cell
CI	Confidence Interval
DBS	Dried Blood Spot
DTS	Dried Tube Specimens
EA	Enumeration Area
HBTC	Home-Based Testing and Counseling
HIV	Human Immunodeficiency Virus
LAg	Limiting Antigen
mL	Milliliter
µL	Microliter
MOH	Ministry of Health
MOS	Measure of Size
MPHIA 2020-2021	Malawi Population-based HIV Impact Assessment 2020-2021
MTCT	Mother-to-Child Transmission
NAC	National AIDS Commission
ODn	(normalized) Optical Density
PCR	Polymerase Chain Reaction
PEPFAR	US President's Emergency Plan for AIDS Relief
PHIA	Population-based HIV Impact Assessment
PMTCT	Prevention of Mother-to-Child Transmission
PrEP	Pre-Exposure Prophylaxis
PSU	Primary Sampling Unit
QA	Quality Assurance
QC	Quality Control
RR	Response Rate
SMS	Short Message Service
TB	Tuberculosis
TNA	Total Nucleic Acid
UNAIDS	Joint United Nations Programme on HIV and AIDS
VLS	Viral Load Suppression
VMMC	Voluntary Medical Male Circumcision
WHO	World Health Organization

FOREWORD

The Malawi Population-based HIV Impact Assessment 2020-2021 (MPHIA 2020-2021) is the second MPHIA in Malawi to estimate national HIV incidence, and national and subnational prevalence of HIV and viral load suppression. The first MPHIA was conducted from November 2015 through August 2016. The results of these surveys provide information on national and subnational progress toward control of the HIV epidemic.

MPHIA 2020-2021 was led by the Government of Malawi through the Ministry of Health and the National AIDS Commission in partnership with US Centers for Disease Control and Prevention (CDC), ICAP at Columbia University, local civil society organizations, and other international development partners.

We would like to acknowledge the efforts of the national and international organizations in the planning and implementation of the survey and in writing this report, in particular, the MPHIA Technical Working Group and Steering Committee. We would also like to acknowledge funding from the United States President's Emergency Plan for AIDS Relief (PEPFAR) to conduct the MPHIA surveys. We are especially grateful to our field staff and the respondents, who graciously provided their time and data for the benefit of the nation.

This report is meant to present detailed survey findings covering the primary and secondary survey objectives of the MPHIA 2020 - 2021.

I would like to encourage policy makers, planners, program managers, and all stakeholders who work in in the HIV response and other communicable and related diseases in the country, to use these findings to make informed policy decisions based on the current statistics presented in this report and through further analyses of the rich dataset that resulted from the survey. I would also like to encourage researchers to take advantage of the rich biorepository from this survey to study other diseases that may be prevalent in our country.

Dr. Charles Mwasambo
Secretary for Health

PREFACE

The Malawi Population-based HIV Impact Assessment (MPHIA 2020-2021) was a household-based national survey among adults (defined as those aged 15 years and older) to measure the impact of the national HIV response. MPHIA 2020-2021 offered HIV counseling and testing with return of results and collected information about uptake of HIV care and treatment services. Conducted from January 2020 through April 2021, the survey was originally intended to take place over the first several months of 2020, but due to the COVID-19 pandemic had to be paused from April 2020 until March 2021 (see below).

This was the second MPHIA in Malawi to estimate national HIV incidence, and national and subnational prevalence of HIV and viral load suppression (VLS), defined as HIV RNA <1,000 copies per mL (copies/mL). The first MPHIA was conducted from November 2015 through August 2016. The results of these surveys provide information on national and subnational progress toward control of the HIV epidemic.

MPHIA 2020-2021 was led by the Government of Malawi through the Ministry of Health and the National AIDS Commission. The survey was conducted with funding from the United States (US) President's Emergency Plan for AIDS Relief (PEPFAR) and through technical assistance and partnership with the US Centers for Disease Control and Prevention (CDC). MPHIA 2020-2021 was implemented by ICAP at Columbia University in collaboration with government of Malawi at national and subnational levels. The government of Malawi, local civil society organizations, and international development partners participated in steering committees and technical working groups during study implementation.

MPHIA 2020-2021 used a two-stage, stratified cluster sample design, that first selected census enumeration areas (EAs) and then selected households within each EA. The first stage selected 438 EAs with an average of 35 households per EA (Table 2.1). The overall sample size and allocation by subnational area (ie, health zones) was calculated to estimate incidence at the national level among adults aged 15-49 years, and VLS at both the health zone and national levels among adults aged 15-49 years living with HIV, and VLS at the national level among young women aged 15-24 years* living with HIV. To reach the target sample size, the study planned to enroll at least 20,376 eligible adults aged 15-49 years and 5,202 eligible adults aged 50 years and older—with approximately 19,463 persons aged 15 years and older expected to participate in the survey.

Of 13,958 occupied eligible households, 91.6% completed a household interview (Table 2.2). Among 30,049 eligible adults aged 15 years and older (16,745 women and 13,304 men), a total of 26,519 adults participated in the individual interview. Among those interviewed, 22,662 (13,067 women and 9,595 men) also had their blood drawn (Table 2.3).

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

The survey was performed under difficult circumstances at the start of the COVID-19 pandemic. Like many other nations, the Government of Malawi instituted a series of policies to contain the potential spread of SARS-CoV-2. ICAP, CDC and MOH reached a decision to pause data collection on March 30, 2020.

During the pause, the project team continually monitored the COVID-19 situation in the country and worked with partners to develop guidelines for mitigating risk of COVID-19 transmission during survey implementation. These comprehensive guidelines prioritized the health and well-being of the team members, members of surveyed households, and the larger communities in which data collection took place (see COVID-19 mitigation, in Chapter 2). After an 11-month hiatus, in March 2021, the survey resumed data collection, implementing precautions that allowed teams to safely go into communities with COVID-19.

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

EXECUTIVE SUMMARY

TOPLINE FINDINGS

- The annual HIV incidence among adults (defined as individuals 15 years and older) was 0.21%, which corresponds to approximately 20,000 new cases of HIV annually.
- HIV prevalence among adults was 8.9%, which corresponds to approximately 946,000 adults living with HIV in Malawi.
- Prevalence of VLS among all adults living with HIV in Malawi was 87.3%.

TOPLINE FINDINGS IN FOCUS

- The annual HIV incidence among adults (those aged 15 years and older) in Malawi was 0.21%, which corresponds to approximately 20,000 new cases of HIV per year among adults. HIV incidence was 0.29% among women and 0.12% among men (Tables 5.1 and 5.2).
- Prevalence of HIV among adults was 8.9%, which corresponds to approximately 946,000 adults living with HIV. Women had a markedly higher HIV prevalence than men, at 10.5% (95% CI: 9.9%-11.1%*) compared to 7.1% (95% CI: 6.5%-7.7%*) (Tables 6.2 and 5.2).
- 87.3% of adults living with HIV in Malawi had suppressed viral loads: 88.4% of women and 85.5% of men. Note that these estimates of VLS are among all adults living with HIV regardless of their knowledge of HIV status or use of antiretroviral therapy (ART) (Table 8.1).
- At the subnational (health zone) level, prevalence of VLS varied from 78.8% in Lilongwe City and 81.0% in Blantyre City up to 89.2% in South East and South West (Table 8.1, Figure 8.1.1 and 8.1.2).

Approximately 20,000 new cases of HIV occurred in the year of the survey among adults

THE UNAIDS 90-90-90 TARGETS

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

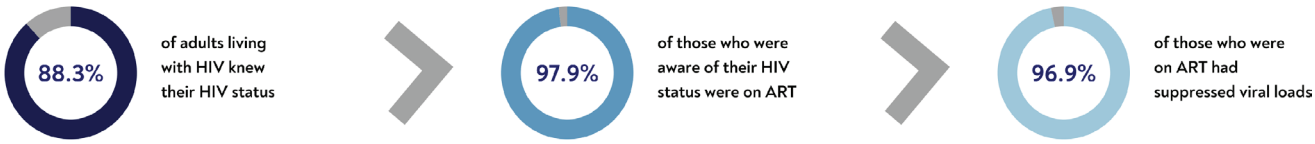
There were 946,000 people living with HIV at the time of the survey

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

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

- **Diagnosed:** In Malawi, 88.3% of adults living with HIV were aware of their HIV-positive status. A higher proportion of women than men living with HIV were aware of their HIV-positive status: 90.4% (95% CI: 88.6%-92.2%*) compared to 85.0% (95% CI: 81.9%-88.1%*).
- **On treatment:** Among those who were aware of their HIV-positive status, 97.9% were on ART: 98.2% of women and 97.4% of men.
- **With viral load suppression:** Among those aware of their status and on treatment, 96.9% had suppressed viral loads: 96.9% of women and 96.8% of men.

Figure 1
Conditional 95-95-95 Achievements Among Adults



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

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

Prevalence of VLS varied from close to 79% in Lilongwe and 81% in Blantyre City up to 89% in South East and South West

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

- **Diagnosed:** 88.3% of adults living with HIV were aware of their HIV status: 90.4% (95% CI: 88.6%-92.2%*) of women and 85.0% (95% CI: 81.9%-88.1%*) of men.
- **On treatment:** Among all adults living with HIV in Malawi, 86.5% were on ART: 88.7% among women and 82.8% among men.
- **On treatment with viral load suppression:** Among all adults living with HIV in Malawi, 83.8% had achieved VLS on treatment: 86.0% among women and 80.1% among men.

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

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

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

- **Diagnosed:** 76.2% of young people living with HIV were aware of their HIV status: 75.8% among young women and 77.2% among young men.
- **On treatment:** Among all the young people living with HIV who were aware of their status, 95.9% were on ART: 96.2% among young women and 95.4%‡ among young men.
- **On treatment with viral load suppression:** Among all the young people living with HIV who were on ART, 90.7% had achieved VLS: 90.7% among young women and 90.6%‡ among young men.

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

- **Diagnosed:** 76.2% of all young people living with HIV were aware of their HIV status: 75.8% among young women and 77.2% among young men.
- **On treatment:** 73.1% of all the young people living with HIV were on ART: 72.9% among young women and 73.6% among young men.
- **On treatment with viral load suppression:** 66.3% of all the young people living with HIV had achieved VLS on treatment: 66.2% among young women and 66.7% among young women.

95-95-95 analyses among other subgroups:

- Achievement of the unconditional (overall) 95-95-95 targets peaked among those in older age groups. For instance, among all adults living with HIV aged 35-49 years 92.6% were diagnosed, 91.1% were on treatment, and 89.1% had achieved VLS on treatment. The rates were similar for those aged 50 years and older (Table 9.1.A).

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

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

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

- At the subnational level, there was notable variation in achievement of the conditional 95-95-95 targets. For instance, achievement of the first 95 (awareness of HIV status among people living with HIV) ranged from 83.0% in Central East to 91.1% in South East. Each of the health zones achieved the second 95 target, except for Central West, which came very close, at 94.4%. Central East placed 100.0% of those diagnosed on treatment. All the health zones reached the third 95 target of VLS among those on ART (Table 9.3.B).

85% of people living with HIV had viral loads below 200 copies/mL

OTHER KEY FINDINGS

Household characteristics

- In Malawi, 16.6% of households had at least one HIV-positive member. There was at least one HIV-positive member in 15.5% of rural households, and 21.9% of urban households (Table 3.4 and Figure 3.4).
- A higher proportion of female-headed households was headed by a person living with HIV than male-headed households: 17.1% (95% CI: 15.9%-18.3%*) versus 9.8% (95% CI: 8.9%-10.8%*) (Table 3.5 and Figure 3.5).

Survey respondent characteristics

- More than a third (36.0%) of the survey respondents were young people aged 15-24 years, while only 16.6% were 50 years and older (Table 4.1).

HIV incidence

- Annual HIV incidence among adults aged 15 and older was 0.21% (95% CI: 0.10%-0.32%) (Table 5.1).
- Annual incidence of HIV among adults aged 15-49 years was 0.23%: 0.31% (95% CI: 0.13%-0.50%) among women and 0.15% (95% CI: 0.00%-0.32%) among men (Table 5.1).
- The annual incidence of HIV among young people aged 15-24 years was 0.25% (95% CI: 0.06%-0.44%): 0.42% (95% CI: 0.09%-0.75%) among young women aged 15-24 years and 0.07% (95% CI: 0.00%-0.22%) among young men aged 15-24 years. It should be noted, however, that the survey was not powered to generate estimates with confidence among subgroups smaller than the population aged 15-49 years (Table 5.1).

HIV prevalence

- HIV prevalence varied considerably across the country's health zones. It was below 5% among adults aged 15 years and older in Central East and Central West, and peaked in South West and Blantyre City at 14.2%. HIV prevalence was lower in rural settings at 8.2% (95% CI: 7.6%-8.7%*) than in urban settings at 12.1% (95% CI: 10.9%-13.4%*) (Table 6.2, Figure 6.2.1, and Figure 6.2.2).
- HIV prevalence was twice as high among those with no education, at 11.1% (95% CI: 9.7%-12.5%*) than among those with more than secondary education, at 5.5% (95% CI: 3.8%-7.3%*). Conversely, while HIV prevalence was 7.0% in the two lowest wealth quintiles, it was 10.5% and 10.2% in the two highest wealth quintiles, respectively (Table 6.2).
- By 5-year age group, HIV prevalence peaked at 20.8% among adults aged 45-49 years. Prevalence ranged from 1.7% among older adolescent girls aged 15-19 years to 22.1% among women aged 45-49 years, and from 1.3% among young men aged 20-24 years to 20.0% among men aged 50-54 years (Table 6.3).

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

99% of the women living with HIV who gave birth in the 12 months before the survey took ART to reduce mother-to-child transmission

HIV testing, diagnosis, and treatment status

- Among adults aged 15 years and older, 79.2% reported they had ever received an HIV test, with a higher percentage among women, 83.4% (95% CI: 82.6%-84.2%*) than among men, 74.5% (95% CI: 73.4%-75.6%*) (Table 7.1.A-C).
- It should be noted that older adolescents aged 15-19 years and older adults (the age groups above 55 years) were much less likely to report they had ever had an HIV test. In each age group between the ages 20 and 54 years, the percentage who reported ever having an HIV test was at least 85.0% and peaked at 93.8% among adults aged 30-34 years: 98.3% among women and 88.9% among men in that age group (Tables 7.1.A-C).
- Among adults aged 15 years and older who said they were not HIV positive, 47.1% reported they had tested in the 12 months before the survey. This peaked at 60.8% among those aged 25-29 years (Table 7.1.C).
- Among the adults aged 15 years and older who did not report they were HIV positive but tested HIV positive in the survey, 80.3% said they had received an HIV test, but only 34.5% reportedly had tested in the 12 months before the survey (Table 7.1.C).
- Based upon self-report, adjusted for the detection of ARVs in blood (see table reference below), 11.7% of adults who tested positive in the survey were unaware of their HIV status: 9.6% among women and 15.0% among men. Among young people aged 15-24 years, 23.8% were unaware of their status. By 5-year age group, the proportion who said they were unaware of their HIV-positive status peaked at 25.6% among young women aged 20-24 years, and 32.4%† among men aged 25-29 years (Tables 7.2.A-C).
- Among the adults aged 15 and older who tested HIV positive in the survey, 19.8% who said they were not previously diagnosed had ARVs detectable in their blood. Similarly, 12.3% of those who said they knew they were HIV positive but were not yet taking ART, had ARVs detectable in their blood (Table 7.3.C).

Viral load suppression among all adults living with HIV

- In addition to subnational variation in the rates of VLS mentioned earlier, the prevalence of VLS was lower in urban areas, at 81.4% (95% CI: 77.9%-84.8%*), than in rural settings, at 89.1% (95% CI: 87.5%-90.8%*) (Table 8.1).
- Comparing 10-year age groups, young people aged 15-24 years and adults aged 25-34 years, had a lower prevalence of VLS, at 73.8% (95% CI: 67.0%-80.5%*) and 80.1% (95% CI: 76.0%-84.2%*), respectively, than among older adults. For instance, the prevalence of VLS among adults aged 35-44 years was 89.6% (95% CI: 87.0%-92.1%*) which was similar to the other older age groups (Table 8.2).
- Population viremia (the proportion among all the adults aged 15 years and older with unsuppressed viral load [≥1,000 HIV RNA per mL])—see chapter 8) in Malawi was 1.1%. By health zone, population viremia ranged from 0.5% in Central East and Central West up to over 2.0% in the cities, with 2.2% in Lilongwe City and 2.7% in Blantyre City (Table 8.3, and Figure 8.3).
- Among all adults living with HIV, 85.2% had viral loads below 200 copies/mL, 86.3% among women, and 83.4% among men (Table 8.4).
- Based on self-report and ARV detection, 95.2% of those who knew they were HIV positive and taking ART had viral loads below 200 copies/mL (Table 8.4).
- Among all adults living with HIV who reported they were receiving HIV care, 77.8% said that

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

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

they had ever had a viral load test, and among those, 54.0% reported that they had received the results of their last viral load test (Table 8.5).

- Access to viral load testing varied by health zone, ranging from 66.7% in Central West up to 83.1% in Blantyre City. However, living in a health zone with better rates of viral load testing did not necessarily mean one was more likely to get the results back. For instance, 81.8% of those living in South West reported that they had ever had a viral load test, but only 50.6% among those said they had received the results back from their most recent test (Table 8.5).

81% of HIV-negative adults who had heard of PrEP said they would be willing to take it to prevent HIV-infection

Clinical perspectives on people living with HIV

- The median CD4 count among adults living with HIV was 524 cells/microliter (µL): 596 cells/µL among women and 430 cells/µL among men (Table 10.1).
- Among adults living with HIV, CD4 count varied depending on awareness of HIV status and treatment status. The median CD4 count was 424 cells/µL among those who were unaware of their status, 294 cells/µL* among those who were aware of their status but not on ART, and 542 cells/µL among those who were aware of their status and on ART (Table 10.1 and Figure 10.1).
- Among adults who said they were unaware of their HIV status when they tested HIV positive in the survey, 25.7% had a CD4 between 200-349/µL and 11.7% had advanced HIV disease (less than 200 CD4 cells/µL) (Table 10.2).
- Based upon self-report, 98.6% of all adults living with HIV who had started on ART were still taking it: 98.8% among women and 98.1% among men (Table 10.3).

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

- Among women of childbearing age (ages 15-49 years, henceforth referred to as women in this section) who delivered a child in the 3 years before the survey, 98.7% reported attending at least one antenatal care (ANC) visit for their most recent birth (Table 11.1).
- Among women who delivered in the 12 months before the survey, 93.7% reported that they knew their HIV status: 4.3% already knew they were HIV positive, 87.9% tested HIV negative, and 1.4% tested positive during ANC testing (Table 11.2 and Figure 11.3).
- Among women living with HIV who delivered in the 12 months before the survey, 99.0% reported that they took ART to reduce mother-to-child transmission: 69.8% reported that they were already on ART before becoming pregnant, and 29.2% reported that they started ART during pregnancy or labor or delivery (Table 11.3 and Figure 11.3).
- Among women who delivered in the 3 years before the survey, 65.6% reported that they were still breastfeeding their last-born child at the time of the survey, 33.5% reported that they had breastfed but were no longer doing so, while 0.9% reported that they had never breastfed. A lower proportion of women living with HIV (based upon self-report) said they were currently breastfeeding their last-born child, 55.7% (95 CI: 50.2%-61.2%*) compared to HIV-negative women, at 65.4% (95 CI: 63.5%-67.3%*) (Table 11.4).
- Among women living with HIV who delivered within the 3 years before the survey, 18.5% reported that their infant had an HIV test before they were 2 months of age, while 45.7% reported that their infant had an HIV test when they were between 2 and 12 months of age (Table 11.5).
- Among women living with HIV, 91.7% (95% CI: 87.5%-95.9%*) of those who were breastfeeding at the time of the survey had suppressed viral loads compared to 74.6% (95 CI%: 63.3%-85.8%*) of those who were pregnant at the time of the survey (Table 11.6 and Figure 11.6).

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

Although almost 80% of adults living with HIV have received a viral load test, only about half said that they had received the results of their last test

HIV risk factors

- Adults aged 15 years and older who reported having more than one lifetime sexual partner had a higher prevalence of HIV, 11.9% (95% CI: 11.2%-12.6%*) than those who reported only having one lifetime partner, 5.0% (95% CI: 4.4%-5.5%*) (Table 12.2).
- 8.1% of women and 14.1% of men reported that they had sexual intercourse before the age of 15 years (early sexual debut). HIV prevalence among those who reported early sexual debut was 14.0% among women and 5.4% among men (Tables 12.1, and 12.2).
- Among young people, 9.5% of young women aged 15-24 years and 20.6% of young men aged 15-24 years reported early sexual debut. There was some variation in reported early sexual debut by residence. A smaller proportion of young people living in urban settings reported early sexual debut, 11.3% (95% CI: 9.4%-13.2*), than in rural settings, 15.6% (95% CI: 14.6%-16.6%*) (Table 12.3%).
- Early sexual debut was also less common among those who had more than a secondary education, 3.8% (95% CI: 0.9%-6.7%*) than among those with only a primary education, 17.5% (95% CI: 16.3%-18.8%*) (Table 12.3).
- Among adults aged 15 years and older who reported that they had had sex in the 12 months before the survey, 28.5% reported that they had had sex with a nonmarital, noncohabitating partner, 20.3% among women and 36.2% among men. Among these, 49.6% (39.6% of women and 55.0% of men) reported that they had used a condom the last time they had sex with such a partner (Tables 12.4.A-C and Figure 12.4).
- By 5-year age group, self-reported sex with nonmarital, noncohabitating partners in the 12 months before the survey peaked at 71.5% among older adolescents aged 15-19 years; and among these, 62.7% said that they had used condoms the last time they had sex with such a partner (Tables 12.4.C).
- Among men aged 15 years and older, 15.3% reported they had a medical circumcision, 18.1% had a nonmedical circumcision, and 66.6% were uncircumcised. Among young men aged 15-24 years, 23.6% had a medical circumcision and 14.4% had a nonmedical circumcision (Table 12.5).
- There was variation in the uptake of medical male circumcision by residence and health zone. A higher proportion of men aged 15 years and older living in urban settings reported medical male circumcision, 24.8% (95% CI: 22.7%-26.9%*) compared to those in rural settings at 13.1% (95% CI: 12.1%-14.2%*). By health zone, the uptake of medical circumcision ranged from 7.1% in North up to 32.1% in Blantyre City (Table 12.5).
- Wealth and education also appear to be associated with whether men reported medical circumcision. The proportion reporting medical circumcision ranged from 10.2% in the lowest wealth quintile up to 24.4% among those in the highest wealth quintile and from 6.4% among those with no education up to 28.7% among those who had more than a secondary education (Table 12.5).
- MPHIA 2020-2021 also assessed awareness of pre-exposure prophylaxis (PrEP) and the willingness of men and women to take it. Among adults, 14.8% reported that they had heard of PrEP before the survey: 12.4% among women, and 17.6% among men. There was variation by residence, from 13.2% in rural settings up to 22.2% in urban settings; by health zone, from 10.8% in Central West to 23.0% in Blantyre City; by wealth, from 10.6% in the lowest quintile up to 23.0% in the highest; and most markedly, by education, from 9.2% among those with no education up to 43.0% among those who had more than secondary level education (Table 12.6).
- Among the HIV-negative adults who reported they had previously heard of PrEP, 80.6% said that they would be willing to take it: 80.2% among women and 80.9% among men. Notably, among the adults who had not previously heard of PrEP—but had learned about it during the survey interview, 68.2% said that they would be willing to take it. Among HIV-negative adults

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who had been offered PrEP before the survey, 33.8% reported that they had taken it: 19.0% of women and 41.6% of men (Tables 12.7 and 12.8).

Participant-reported uptake of HIV testing in TB clinics, and receipt of TB screening in HIV clinics were below global targets

Tuberculosis, cervical cancer screening, and other chronic conditions

- Among women aged 15 years and older living with HIV in Malawi, only 37.9% reported that they had been screened for cervical cancer. Among these, 3.3% reported that they had received an abnormal result (Table 13.1).
- Among women, there were variations and disparities in the self-reported receipt of cervical cancer screening services by residence, health zone and wealth quintile.
  - A lower percentage of women reported receipt of cervical cancer screening in rural areas than in urban settings: 35.5% (95% CI: 31.7%-39.4%*) versus 45.7% (95% CI: 40.7%-50.7%*).
  - Receipt of cervical cancer screening ranged from 24.6% in Central East up to 47.6% in Blantyre City.
  - By wealth, receipt of cervical cancer screening ranged from 25.0% in the lowest quintile up to 47.7% in the highest (Table 13.1).
- According to adults who reported that they attended a tuberculosis (TB) clinic in the 12 months before the survey, 50.2% were tested for HIV, 6.3% already knew they were HIV positive, but 43.5% reported that they did not know their status (Table 13.3 and Figure 13.3).
- Among adults living with HIV, 10.3% reported that they had visited a TB clinic in the 12 months before the survey. Among those, 10.8% said they received a TB diagnosis, and among those who were diagnosed with TB, 80.6%† said that they were treated for TB during that period (Table 13.4).
- Among adults living with HIV in the survey, 56.3% reported that they had been screened for TB at their last clinic visit (Table 13.5 and Figure 13.5).

GAPS AND UNMET NEEDS

- Despite progress, Malawi remains highly impacted by HIV.
- With 20,000 new HIV infections per year, it will take considerable efforts to reach the goal of "no new infections" by the end of the decade.
- Most new infections occur among young people and adults aged 25-34 years which suggests there is a continued need for HIV prevention options tailored to young people and adults as they form relationships, enter the workforce and start families. Notably, a quarter of young women aged 20-24 years who tested positive in MPHIA 2020-2021 were unaware of their status, and the proportion was similar among men aged 25-34 years.
- Women continue to be disproportionately affected by HIV. HIV prevalence was two times higher among women than men in each 5-year age group between ages 20 and 39 years. In addition, more than one out of six of the female-headed households were led by a woman living with HIV.
- There was considerable subnational variation in several programmatic indicators (achievement of the 95-95-95 targets, the receipt of viral load test results, male circumcision, and awareness and uptake of PrEP).
- Some of those who said they were unaware of their HIV status when they tested positive in the survey had suppressed immune systems or even advanced HIV disease. However, it is unclear if these individuals were truly diagnosed late or whether they may have been previously diagnosed, lost-to-follow-up and simply reported that they did not know their HIV status.
- Although almost 80% of adults living with HIV reported that they had received a viral load test, only about half said that they had received the results of their last test.

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

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

- While awareness of HIV status during pregnancy was over 93%, the target is for all pregnant women to know their HIV status to prevent vertical transmission.
- There were disparities in self-reported uptake of medical male circumcision and awareness of PrEP by education and wealth.
- While less than 15% of the survey participants had heard of PrEP before the survey, many participants expressed an interest in taking it, including those who first heard of PrEP during the survey.
- Cervical cancer screening rates were below 40% among women living with HIV, particularly in rural settings, certain health zones, and among poorer women.
- Participant-reported uptake of HIV testing in TB clinics, and receipt of TB screening in HIV clinics were well below WHO recommendations that 1) anyone visiting a clinic for TB services should be tested for HIV, and 2) that all people living with HIV receive TB symptom screening at every clinic visit.

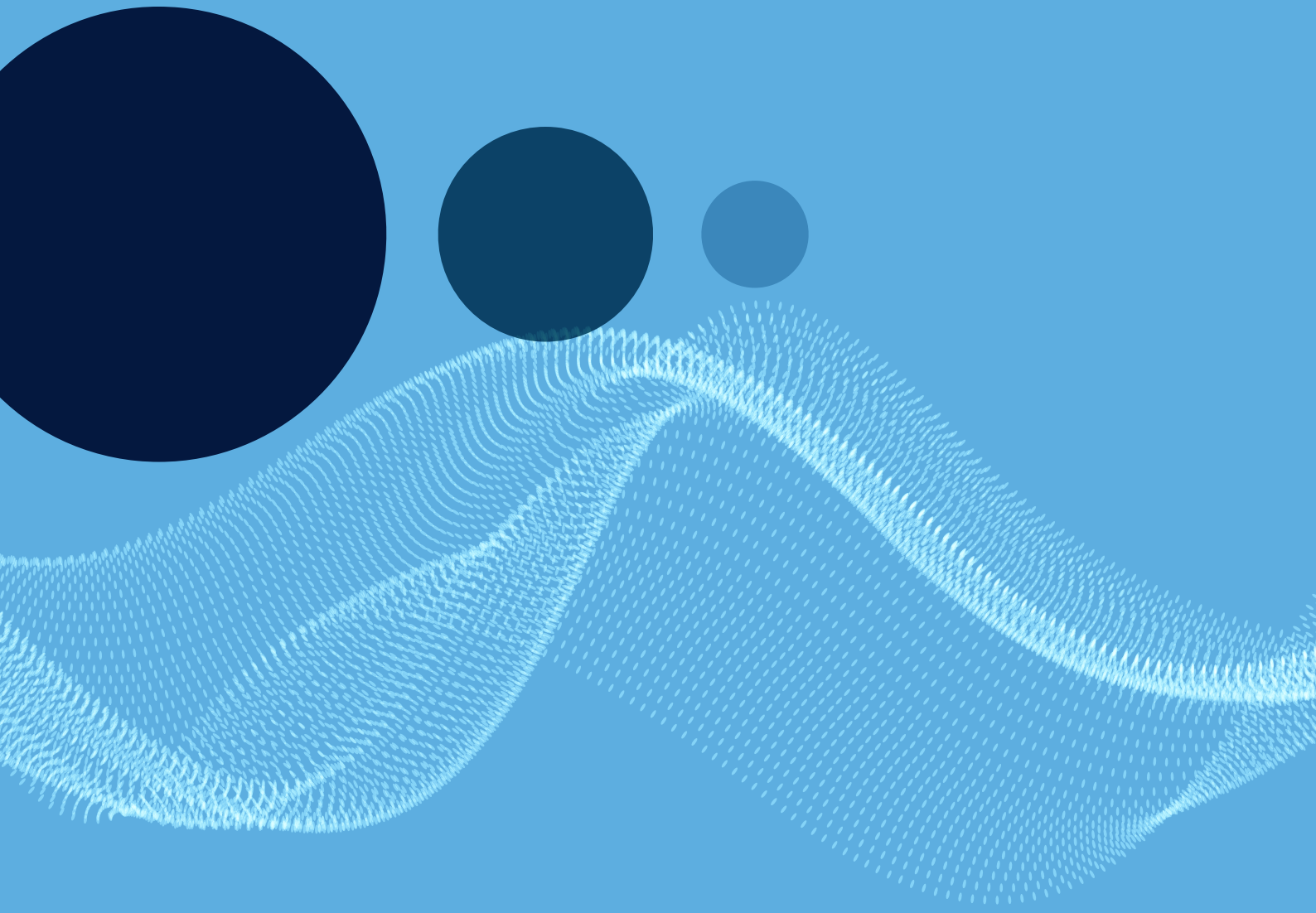
PROGRAMMATIC RESPONSES OR RECOMMENDATIONS FROM MOH

- Effective linkage to care, retention on ART, and adherence support to maintain an undetectable viral load, remain important components of Malawi's prevention strategy, particularly among younger adults living with HIV. However, ART alone will not be enough to achieve the country's prevention goals. Despite progress in providing treatment and achieving viral load suppression, there are still barriers to achieving the first 95.
- Whether diagnosed late or previously diagnosed and lost-to-follow-up, efforts should be made to identify and provide close follow-up and support for any HIV-positive person with immune suppression and/or advanced HIV disease who is not on ART, because they are at heightened risk of developing life-threatening opportunistic infections and AIDS-related cancers while they remain off-treatment.
- As Malawi increases rates of VLS, it may become harder to find incident HIV infections in the general population. Expanding existing HIV surveillance systems that include case surveillance, including HIV recency testing and a rapid public health response to identify clusters of new HIV diagnoses and interrupt transmission could improve timely diagnosis, and help bring HIV incidence down to zero.
- The program will monitor whether the uptake of early infant diagnostic testing, which was well below national targets according to the self-reported data in the survey, improves as Malawi rolls out point-of-care services to ANC clinics in all districts.
- Efforts to scale-up high-impact cost-effective primary and combination prevention interventions could be enhanced through differentiated service delivery tailored to meeting the needs of populations at high risk of HIV, especially adolescent girls and young women.
- High-impact interventions, as defined by the Malawi prevention strategy, include condoms and voluntary medical male circumcision (VMMC). Continued efforts to increase uptake of condom use could help avert new infections. The current national HIV strategic plan calls for saturating the market with high quality condoms and lubricants.
- In addition, further expansion of the VMMC program may be necessary to reach the national coverage targets, especially in areas with high HIV prevalence and among men 25 years of age or older.
- The survey suggested that there may be an opportunity for expanding the use of PrEP as part of the HIV combination prevention interventions in Malawi. This tracks well with the national strategic plan, which also identified PrEP as a potential "game changer" prevention opportunity that could be provided to adolescent girls and young women at family planning and sexually transmitted infection clinics, as well as other populations at high risk.

- Continuing to expand access to viral load testing and make the results available to people living with HIV in a timely manner will have the added benefit of supporting the U=U strategy (see Chapter 8).
- Women living with HIV in Malawi could benefit from differentiated services to support their own health and the wellbeing of their families, especially those who are heading a household. In particular, improving access to quality sexual and reproductive health services integrated into HIV service points could improve access and uptake to cervical cancer screening.
- Given the high risk of HIV/TB coinfection in Malawi, intensified efforts to support the implementation of the package of evidence-based TB/HIV interventions (including enhanced case finding and preventive treatment) could help address current gaps in the delivery of TB and HIV activities, such as HIV testing in the TB clinics, and TB symptom screening in the HIV clinics.

CONCLUSION

MPHIA 2020-2021 provided critical data on the primary outcomes of HIV incidence and prevalence of HIV and VLS among adults at national and subnational levels. MOH encourages public health staff, programmers, epidemiologists, and policy makers to examine the MPHIA data for their respective program areas and utilize the data to inform program planning.



1. INTRODUCTION

1.1 BACKGROUND

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

MPHIA 2020-2021 was led by the Government of Malawi through the Ministry of Health (MOH) and the National AIDS Commission (NAC). The survey was conducted with funding from PEPFAR and technical assistance through the US Centers for Disease Control and Prevention (CDC). ICAP at Columbia University implemented the survey in collaboration with Government of Malawi at national and subnational levels. The Government of Malawi, local civil society organizations, and international development partners participated in steering committees and technical working groups to provide input on survey planning and implementation.

1.2 OVERVIEW OF MPHIA 2020-2021

MPHIA 2020-2021 was a household-based national survey among adults (defined as those 15 years and older) that measured the status of Malawi's national HIV response. Conducted from January 2020 through April 2021 (with a pause from April 2020 until March 2021 due to the COVID-19 pandemic), MPHIA 2020-2021 offered HIV home-based testing and counseling (HBTC) with return of results and collected information about households and individuals' backgrounds, and the uptake of HIV care and treatment services. This was the second MPHIA to estimate HIV incidence and prevalence among a nationally representative sample of adults and national and subnational-level viral load suppression (VLS), defined as HIV RNA <1,000 copies per milliliter (mL), among adults living with HIV. The first MPHIA was conducted from November 2015 through August 2016.

With its focus on measuring key biological endpoints in a nationally representative sample of the population, MPHIA 2020-2021 provides direct estimates of HIV-infection risk and burden, the effectiveness and population-level impact of HIV-related prevention, care, and treatment interventions implemented in the country, and Malawi's progress toward the achievement of the UNAIDS 95-95-95 targets.

1.3 SPECIFIC OBJECTIVES

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

The main objectives of the survey were:

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

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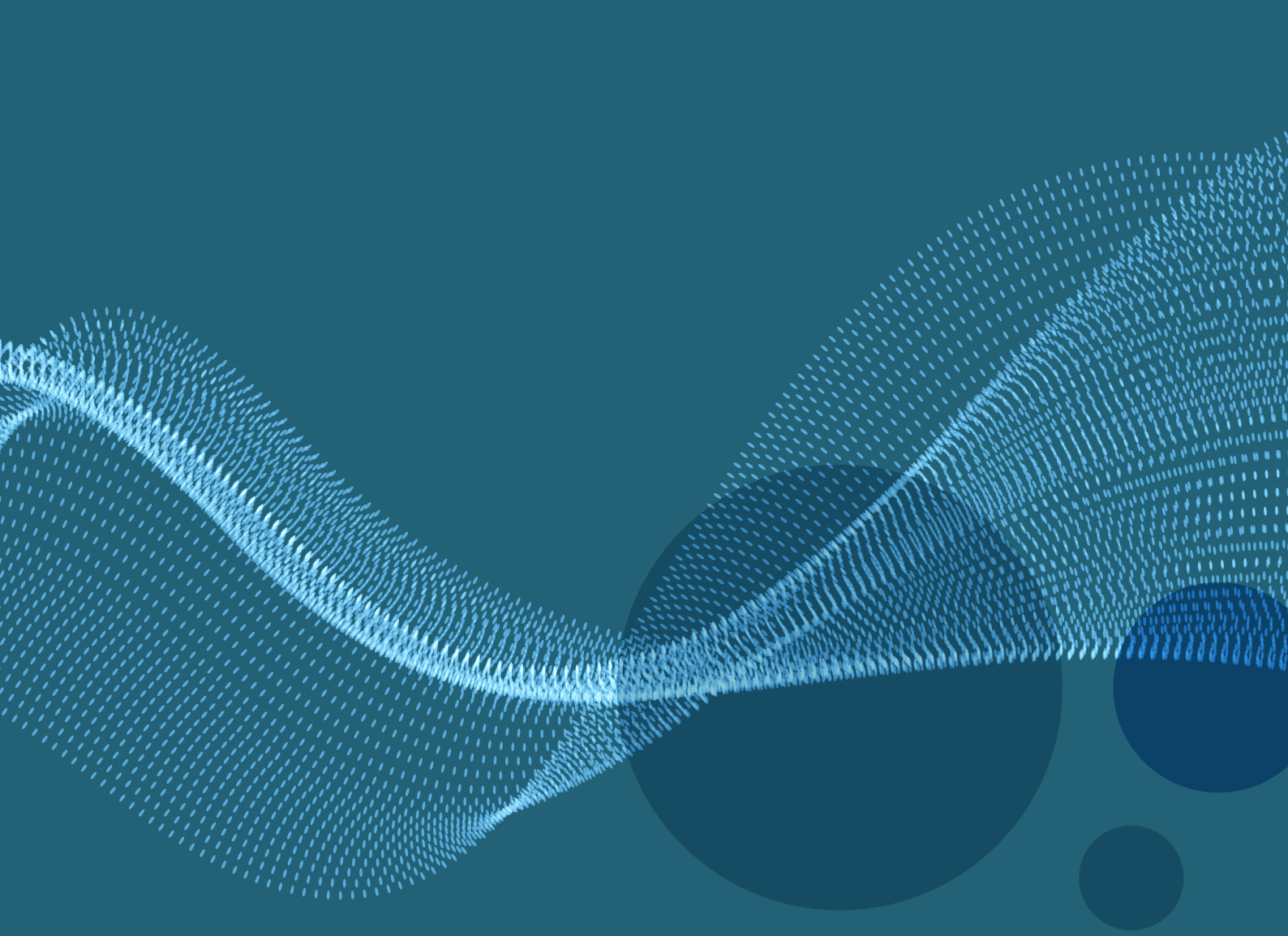
* Joint United Nations Programme on HIV/AIDS (UNAIDS). *Prevailing against pandemics by putting people at the centre. Geneva:* UNAIDS; 2020. https://www.unaids.org/sites/default/files/media_asset/prevailing-against-pandemics_en.pdf.



2. SURVEY DESIGN, METHODS, AND RESPONSE RATES

MPHIA 2020-2021 was a nationally representative, cross-sectional, two-stage, population-based survey of households across Malawi. Its target population corresponded to adults (defined as individuals aged 15 years and older for the purposes of the survey).

2.1 SAMPLE FRAME AND DESIGN

MPHIA 2020-2021 used a two-stage, stratified cluster sample design. The sampling frame was comprised of all households in the country, based upon the Malawi 2018 census sampling frame derived from the 18,463 enumeration areas (EAs) created for the census, with an average number of households and persons per EA of 215 and 948, respectively, at the time of the census.[1] The first stage selected 438 EAs using a probability proportional to size method. The 438 EAs were stratified by seven health zones. During the second stage, a sample of households was randomly selected within each EA, or cluster, using an equal probability method where the average number of households selected per cluster was 35. The actual number of households selected per cluster ranged from 15 to 70 (Table 2.1).

The sample size was calculated to estimate the following indicators: (1) VLS among HIV-positive persons ages 15-49 years at the health zone level with a 95% CI ± 10%; (2) HIV incidence among persons ages 15-49 at the national level with a relative standard error (RSE) < 30%; (3) national-level VLS among HIV-positive persons ages 15-49 years with a 95% CI ± 2.5%; and (4) national-level VLS among HIV-positive women ages 15-24 years with a 95% CI ± 9%. To reach the target sample size, the study planned to enroll at least 20,376 eligible adults aged 15-49 years and 5,202 eligible adults aged 50 years and older—with approximately 19,463 persons aged 15 years and older expected to participate in the survey.

Table 2.1 Distribution of sampled enumeration areas and households by zone

Distribution of sampled enumeration areas and households by zone, MPHIA 2020-2021

	Enumeration Areas			Households		
Zone	Urban	Rural	Total	Urban	Rural	Total
North	8	37	45	302	1,273	1,575
Central East	6	57	63	253	1,952	2,205
Central West	1	64	65	36	2,239	2,275
Lilongwe City	30	0	30	1,050	0	1,050
South East	7	99	106	258	3,451	3,709
South West	3	100	103	106	3,500	3,606
Blantyre City	26	0	26	910	0	910
Total	81	357	438	2,915	12,415	15,330

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

2.2 ELIGIBILITY CRITERIA, RECRUITMENT, AND CONSENT PROCEDURES

In MPHIA 2020-2021, individuals aged 15 years and older were eligible to participate in the survey. The consent criteria included:

- Adults* aged 18 years and older or emancipated minors (an individual aged 15-17 years who is married or is free from any legally competent representative as defined by law in Malawi) who slept in the household the night before the survey, whether they were usual residents in the selected household or overnight visitors, who were willing and able to provide verbal consent.

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

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

A survey interviewer administered the informed consent process using electronic consent forms (see Appendix G) in the following order. First, a designated head of household provided verbal consent for the household interview, after which individual household members were rostered. Once the household interview was completed, eligible adults and emancipated minors could then provide verbal consent for an interview and for participation in the biomarker component of the survey, including HBTC, with return of HIV-testing results during the household visit. Participants had to consent to receipt of their test results to participate in the biomarker component of the survey. If an individual did not want to receive his or her HIV test result, this was considered a refusal and their interview was concluded. The interviewer also asked participants for verbal consent to store their blood samples in a repository to perform additional tests in the future. After the return of HIV rapid test results during the biomarker component of the survey, the interviewer asked all participants who tested HIV positive to provide consent for their viral load and CD4 test results returned with his or her name and age to a health facility of their choice. The interviewer also asked for their consent to share their contact information with a trained healthcare worker or counselor to facilitate active linkage to HIV care to the facility.

The interviewer asked minors aged 15-17 years for their assent to the interview and biomarker components after permission was granted by their parents or guardians. Although parental consent was required for their participation in the survey, minors aged 15-17 years could receive their HIV testing results without their parents being present. The consent process to share contact information for active linkage to care and return of viral load and CD4 results to a health facility was the same as for adults.

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

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

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

2.3 SURVEY IMPLEMENTATION

Training of Field and Laboratory Staff

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

- Scientific objectives of the survey
- Survey design and methods
- Completion of survey forms
- Data collection
- Staff responsibilities
- Recruitment of participants

- Informed consent procedures, including human participants' protection, privacy, and confidentiality
- Blood collection including venipuncture and finger/heel-stick
- Home-based HIV testing and counseling
- Referral of participants to health and social services
- Management and transportation of blood specimens
- Biosafety
- Communication skills
- Protocol deviations, adverse events, and reporting of events

And, after data collection went on hold due to the COVID-19 pandemic:

- COVID-19 risk mitigation trainings: Prior to resumption of data collection after COVID-19, a 5-day training session for all survey staff was conducted to refresh on survey procedures and COVID-19 mitigation measures. The COVID-19 training component included the general COVID-19 introduction and guidance; staff screening, isolation and quarantine procedures (see below).

Laboratory staff were trained in specimen management, including sample processing, labeling, and quality assurance (QA). Central laboratory staff were trained in viral load measurement, early infant diagnosis, HIV confirmatory testing, and HIV recency testing using the limiting antigen (LAg) avidity enzyme immunoassay (see below). In addition, after pausing for COVID-19, laboratory staff received trainings on COVID-19 risk mitigation within the laboratory setting.

COVID-19 Mitigation

Survey fieldwork was paused from April 2020 to March 2021 due to the COVID-19 pandemic. During the pause, the project team continually monitored the COVID-19 situation in the country and worked with partners to develop guidelines for mitigating risk of COVID-19 transmission during survey implementation. Before restarting fieldwork, the project team took precautions to prioritize the health and well-being of the team members, members of surveyed households, and of the greater community where the survey operated. Working in close contact with its partners, the survey team adapted survey-related work to be consistent with rapidly evolving guidance. These approaches included COVID-19 mitigation trainings for survey and laboratory staff, updated community sensitization materials in advance of the survey restart (with an emphasis on holding outdoor community meetings of 10 or less people with all COVID-19 protocols observed), adjustments to the household entry procedures survey team size, and the best practices for interacting with households, including providing personal protective equipment (PPE) to household members.

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

Survey staff were required to reduce their own coronavirus risk through application of the prevention and control measures that were available at the time. Mitigation measures implemented during fieldwork included consistent use of masks for both survey staff and household participants, testing for SARS-CoV-2 before training and the start or restart of fieldwork (in case of a pause), participating in daily symptom screening of all staff using a mobile phone app developed for this purpose before they could be cleared for work, submitting to SARS-CoV-2 testing whenever they screened positive for symptoms consistent with COVID-19, close monitoring of quarantine and isolation periods of those infected or that were close contacts of COVID-19 cases, and providing virtual training for those in isolation or quarantine. Field data collection teams and satellite laboratory shifts operated as cohorts, with all members being considered close contacts of each other. The number of staff interacting with each household was minimized, and staff were encouraged to complete survey procedures outdoors or in well ventilated rooms when possible. Note that not all team members or laboratory facilities were available for the survey restart, so the project team hired and trained new fieldworkers and established additional laboratory facilities.

Survey Staff

Fieldwork started in January 2020 and was completed in April 2021 (with a pause from April 2020 until March 2021 due to the COVID-19 pandemic). At survey launch, the fieldwork was conducted by 36 locally hired field teams with seven members each, including a team leader, four tester/interviewers, and two additional nurse/interviewers. The tester/interviewers performed

interviews, phlebotomy, and testing and counseling while the nurse/interviewer only performed interviews and pretest counselling. Each team was supported by two drivers. Field teams included both male and female staff and members spoke the languages used in the areas to which they were deployed. Following the COVID-19 pause, the survey restarted with a reduced footprint in the field: 32 smaller teams comprised of a team leader, three tester/interviewers, and two nurse/interviewers still supported by two drivers.

Overall, a total of 368 field staff comprising of four regional coordinators, four assistant regional coordinators, 72 nurse/interviewers, 144 tester/interviewers, 36 team leaders, and 72 drivers participated in data collection. The field teams were supervised by their team leaders, and regional coordinators, and managed by central staff who guided and oversaw data collection activities, performed quality checks, and provided technical support (Appendix D).

The laboratory staff were organized at different levels (central laboratory staff, field laboratory officers, supervisors, satellite laboratory managers, satellite/mobile lab technicians, and satellite lab logisticians). At survey launch, 32 satellite laboratory technicians and four central lab technicians processed samples and performed additional procedures for HIV-1 viral load, CD4 counts, quality control (QC), and QA. Note that after the COVID-19 pause, six more satellite staff were hired, with an adjusted rotation shift to allow staff to reduce contact as well as being able to have a full reserve satellite lab team at any time.

Community Sensitization and Mobilization

The survey also employed community mobilization teams to maximize community support and participation before data collection. Prior to the COVID-19 pause, the teams consisted of 12 community mobilization coordinators and 1231 community mobilizers, managed by a mobilization advisor and communication advisor. The mobilization began before fieldwork commenced with a high-level national launch meeting that included key national and regional leaders, mass media, and other stakeholders. Community mobilization teams visited each EA before initiation of data collection and partnered with community mobilizers to meet key gatekeepers in the communities (chiefs, local government officials, and religious and community leaders). The mobilization teams held community sensitization meetings, disseminated written informational materials such as brochures and posters, and held discussions with community residents.

After the survey pause for COVID-19 and relaunch, the teams consisted of 13 community mobilization coordinators and 681 community mobilizers. Door-to-door sensitization was used after relaunch instead of holding large community meetings which could create opportunities for wider transmission. Radio and community-based public address systems were extensively used after the relaunch.

Supervision

Data-collection teams were continuously overseen by field-based supervisors as well as periodically monitored by national and international teams with representation from collaborating institutions. Monitoring teams visited field and laboratory sites at least biweekly and provided direct supervision as well as verification of results by household revisits. Electronic monitoring forms completed by field monitors on tablets/phones and management forms used by teams 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. Weekly debriefing sessions were held between field-based supervisors and monitoring teams. Monitoring reports were circulated to collaborating institutions and the MPHIA 2020-2021 Technical Working Group to respond to any issues.

Electronic Monitoring System

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

Questionnaire Data Collection

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

2.4 FIELD-BASED BIOMARKER TESTING

Blood Collection

Qualified survey staff collected blood from consenting participants: approximately 14 mL of venous blood or 1 mL of capillary blood using finger-stick from individuals who either refused to give venous blood or for whom venous blood draw failed. Blood samples were labeled with a unique barcoded participant identification number and stored in temperature-controlled cooler boxes. At the end of each day, samples were transported to a satellite laboratory for processing into plasma aliquots and dried blood spots (DBS) and were frozen within 24 hours of blood collection at -20° Celsius. Plasma and DBS samples were regularly transferred to the central laboratory for repository storage at -80° Celsius.

HIV Home-Based Testing and Counseling

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

Determine™ HIV-1/2 (Abbott Molecular Inc., Des Plaines, Illinois, United States) was used as a screening test and Uni-Gold™ (Trinity Biotech, plc. Wicklow, Ireland) as a confirmatory test. Individuals with a nonreactive result on the screening test were reported as HIV negative. Individuals with a reactive screening test underwent subsequent testing with Uni-Gold™. Those with reactive results on both the screening and confirmatory tests were classified as HIV positive. Individuals with a reactive Determine™ test followed by a nonreactive Uni-Gold™ test were immediately retested in parallel in the field. If the results during the parallel testing were repeatedly discordant, the individual was classified as inconclusive and referred to a local health facility for repeat testing within 4 weeks as per the national guidelines. Those with an inconclusive or HIV-positive result were given a field test referral form which provided different instructions to the health facility for inconclusive; positive, not on ART; and positive, on ART.

Participants who tested HIV positive and who reported not being on ART were counseled on the possibility of receiving a facilitated linkage to a clinic for ART, care and support and asked to provide verbal consent for their information to be shared with a trained healthcare worker or counselor to facilitate the linkage. If the participant consented, the field staff completed the Active Linkage to Care Form so the participant could be offered a physical escort to the facility of their choice accompanied by a linkage assistant. All organizations participating in linkage to care were trained in confidentiality procedures and detailed procedures on active linkage to care, including eligibility for linkage to care, how contact information should be shared with the facility, community-based organization or a local linkage counselor, mechanisms of facilitated linkage, and documentation of linkage to care.

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

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

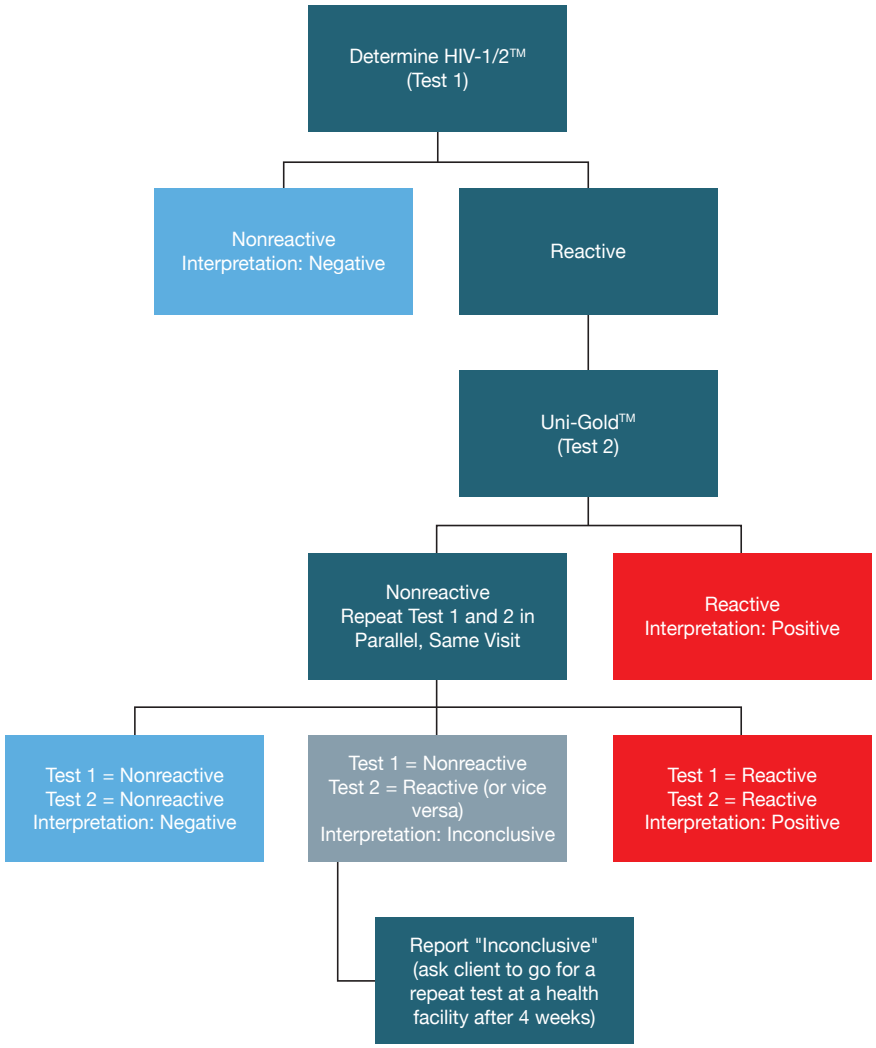


Figure 2.1
Household-based HIV testing algorithm, MPHIA 2020-2021

2.5 LABORATORY-BASED BIOMARKER TESTING

Satellite and Central Laboratories

Thirteen satellite laboratories for the survey were established nationally. One central reference laboratory was chosen for more specialized tests. At each satellite laboratory, trained technicians performed HIV confirmatory testing, QA testing, and processing of whole blood specimens into plasma aliquots and DBS cards for temporary storage at -20°C.

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

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

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

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

CD4 Count Measurement

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

Viral Load Testing

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

Return of CD4 and Viral Load Results

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

HIV Recent Infection Testing Algorithm

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

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

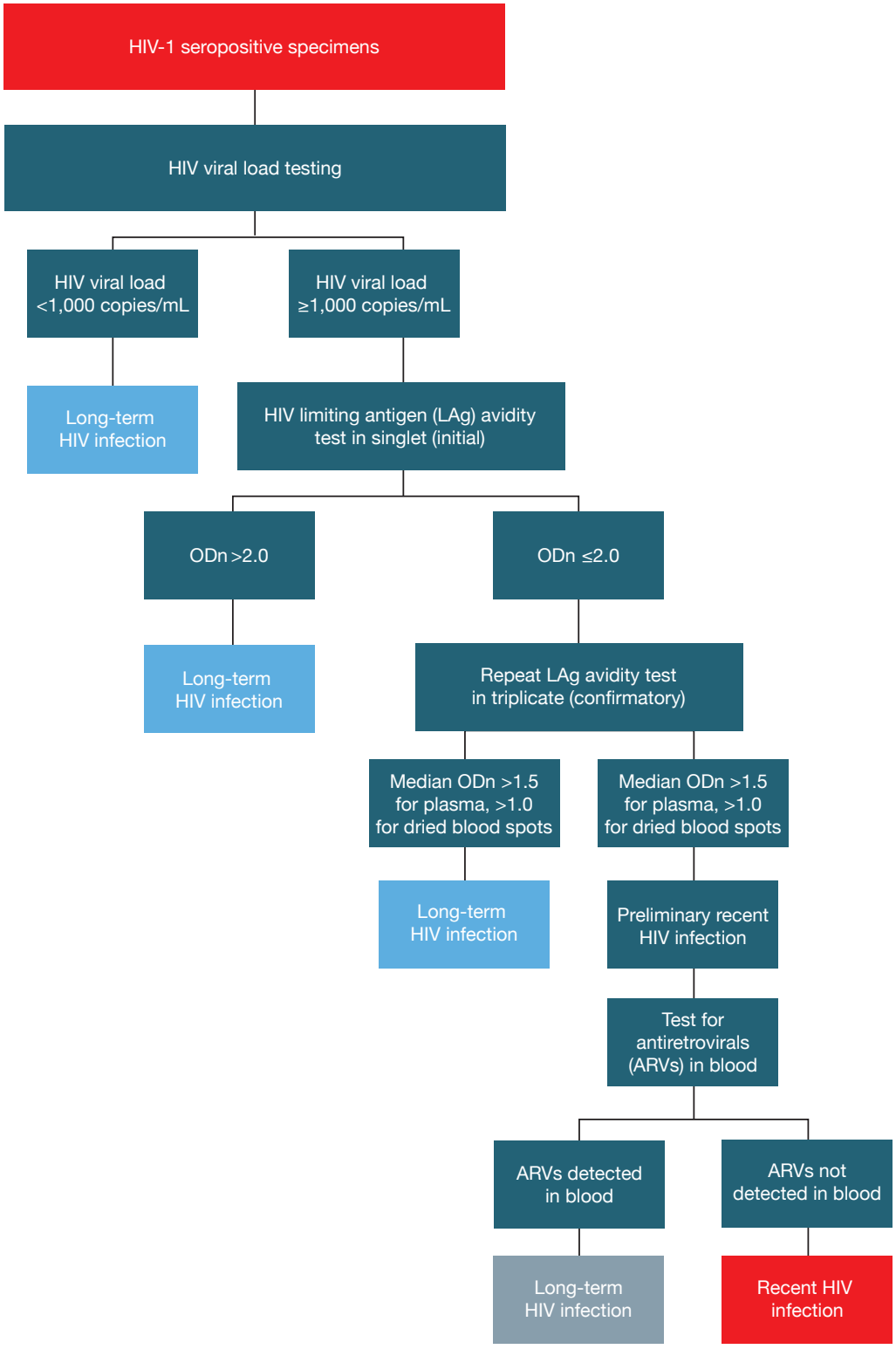


Figure 2.2
HIV-1 recent infection testing algorithm, MPHIA 2020-2021

Abbreviations: mL, milliliter; ODn, normalized optical density; DBS, dried blood spot; ARV, antiretroviral.

Detection of Antiretroviral Drug Resistance

HIV resistance to ARVs was assessed for HIV-positive participants including recent cases, those without VLS (≥1,000 copies/mL; both on treatment and not on treatment), and those with viral load of 200-999 copies/mL. The findings will be presented in a separate addendum to this report.

Detection of Antiretrovirals

Qualitative screening for detectable concentrations of ARVs was conducted on DBS specimens from all HIV-positive participants by means of high-resolution liquid chromatography coupled with tandem mass spectrometry. The method used for ARV detection was a modified version of the methodology described by Koal et al.[2] This qualitative assay was highly specific, as it separates the parent compound from the fragments, and highly sensitive, with a limit of detection of 0.02 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, four ARVs: efavirenz, lopinavir, dolutegravir, and nevirapine were selected as markers for the most prescribed first- and second-line regimens in Malawi. These ARVs were also selected based on their relatively long half-lives, allowing for a longer period of detection following intake.

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

ARV detection was performed by the Division of Clinical Pharmacology of the Department of Medicine at the University of Cape Town, 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 were adjusted for nonresponse and noncoverage. Nonresponse adjusted weights were calculated for households, individual interviews, and individual blood draws in a hierarchical form. Weighting adjustment cells, defined by a combination of variables that are potential predictors of response, were developed to adjust initial individual and blood-level weights for nonresponse. The nonresponse adjustment cells were constructed using chi-square automatic interaction detection, or the Chi-square Automatic Interaction Detector (CHAID) algorithm. The cells were defined based on data from the household interview for the adjustment of individual-level weights, and from both the household and individual interviews for the adjustment of blood sample-level weights. Post-stratification adjustments were implemented to compensate for noncoverage in the sampling process. This final adjustment calibrated the nonresponse-adjusted individual and blood weights to make the sum of each set of weights conform to national population totals by sex and 5-year age groups. Descriptive analyses of RR, characteristics of respondents, and other indicators were conducted using SAS 9.4.

Incidence estimates were based on the number of HIV infections identified as recent with the HIV-1 LAg avidity plus viral load and ARV detection algorithm, and obtained using the formula recommended by the WHO Incidence Working Group and Consortium for Evaluation and Performance of Incidence Assays and with assay performance characteristics of a mean duration of recent infection = 130 days (95% CI: 118, 142), a time cutoff = 1.0 year and percentage false recent = 0.00.[3]

In this report, denominators for a characteristic in a table may differ from the overall table totals due to nonresponse, missing data, and conditional responses. Also, unless otherwise noted in the report, comparisons between estimates were based upon nonoverlapping 95% CIs. Note that CIs are not shown in most of the report tables. However, the public use data package will provide instructions to calculate the CIs, once it is available on the PHIA website.

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

2.7 RESPONSE RATES

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

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

Of the 15,330 selected households, 13,958 were occupied, and of those, 12,815 were interviewed. The overall household RR (unweighted) was 91.6%. After adjusting for differential sampling probabilities and nonresponse, the overall weighted household RR was 91.7% (Table 2.2).

A total of 30,049 individuals (13,304 men and 16,745 women) were eligible to participate in the survey. A total of 26,519 adults participated in the individual interview: interview RRs were 83.5% among men and 91.7% among women. Among those interviewed, 85.8% of men and 84.2% of women also had their blood drawn (Table 2.3).

Table 2.2 Household response rates

Number of households selected, occupied, and interviewed and household response rates (unweighted and weighted), by residence, MPHIA 2020-2021

	Residence		
Result	Urban	Rural	Total
Household interviews			
Households selected	2,915	12,415	15,330
Households occupied	2,701	11,257	13,958
Households interviewed	2,371	10,444	12,815
Household response rate[1] (unweighted)	87.6	92.6	91.6
Household response rate[1] (weighted)	87.8	92.5	91.7

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

Table 2.3 Individual interview 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, MPHIA 2020-2021

Result	Residence				Total		Total
	Urban		Rural				
	Men	Women	Men	Women	Men	Women	
Eligible individuals, ages 15-24 years							
Number of eligible individuals	1,029	1,098	3,874	4,576	4,903	5,674	10,577
Interview response rate (unweighted)	80.2	89.6	80.7	88.1	80.6	88.4	84.8
Interview response rate (weighted)	79.9	89.3	80.2	87.7	80.1	88.0	84.3
Blood draw response rate (unweighted)	86.1	82.9	86.4	84.1	86.4	83.9	85.0
Blood draw response rate (weighted)	85.6	82.8	85.8	83.0	85.7	83.0	84.3
Eligible individuals, ages 15-49 years							
Number of eligible individuals	2,437	2,746	8,628	11,016	11,065	13,762	24,827
Interview response rate (unweighted)	73.2	91.4	84.9	92.4	82.4	92.2	87.8
Interview response rate (weighted)	73.0	91.2	84.7	92.0	82.3	91.9	87.6
Blood draw response rate (unweighted)	82.9	81.9	86.9	86.3	86.1	85.4	85.7
Blood draw response rate (weighted)	82.6	81.7	86.3	85.5	85.6	84.8	85.1
Eligible individuals, ages 15+ years							
Number of eligible individuals	2,747	3,081	10,557	13,664	13,304	16,745	30,049
Number of interviewed individuals	2,039	2,811	9,075	12,594	11,114	15,405	26,519
Number of individuals with blood draw	1,701	2,295	7,894	10,772	9,595	13,067	22,662
Interview response rate (unweighted)	74.2	91.2	86.0	92.2	83.5	92.0	88.3
Interview response rate (weighted)	74.0	91.0	85.7	91.9	83.5	91.7	88.1
Blood draw response rate (unweighted)	83.4	81.6	87.0	85.5	86.3	84.8	85.5
Blood draw response rate (weighted)	83.1	81.4	86.5	84.8	85.8	84.2	84.9
Overall response rate (unweighted)[3]	54.2	65.2	69.3	73.0	66.1	71.5	69.1

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

2.8 REFERENCES

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3. World Health Organization. *WHO Working Group on HIV Incidence Measurement and Data Use.* Geneva: WHO; 2018. https://apps.who.int/iris/bitstream/handle/10665/254868/WHO-HIV-2017.04-eng.pdf. Accessed November 14, 2022.

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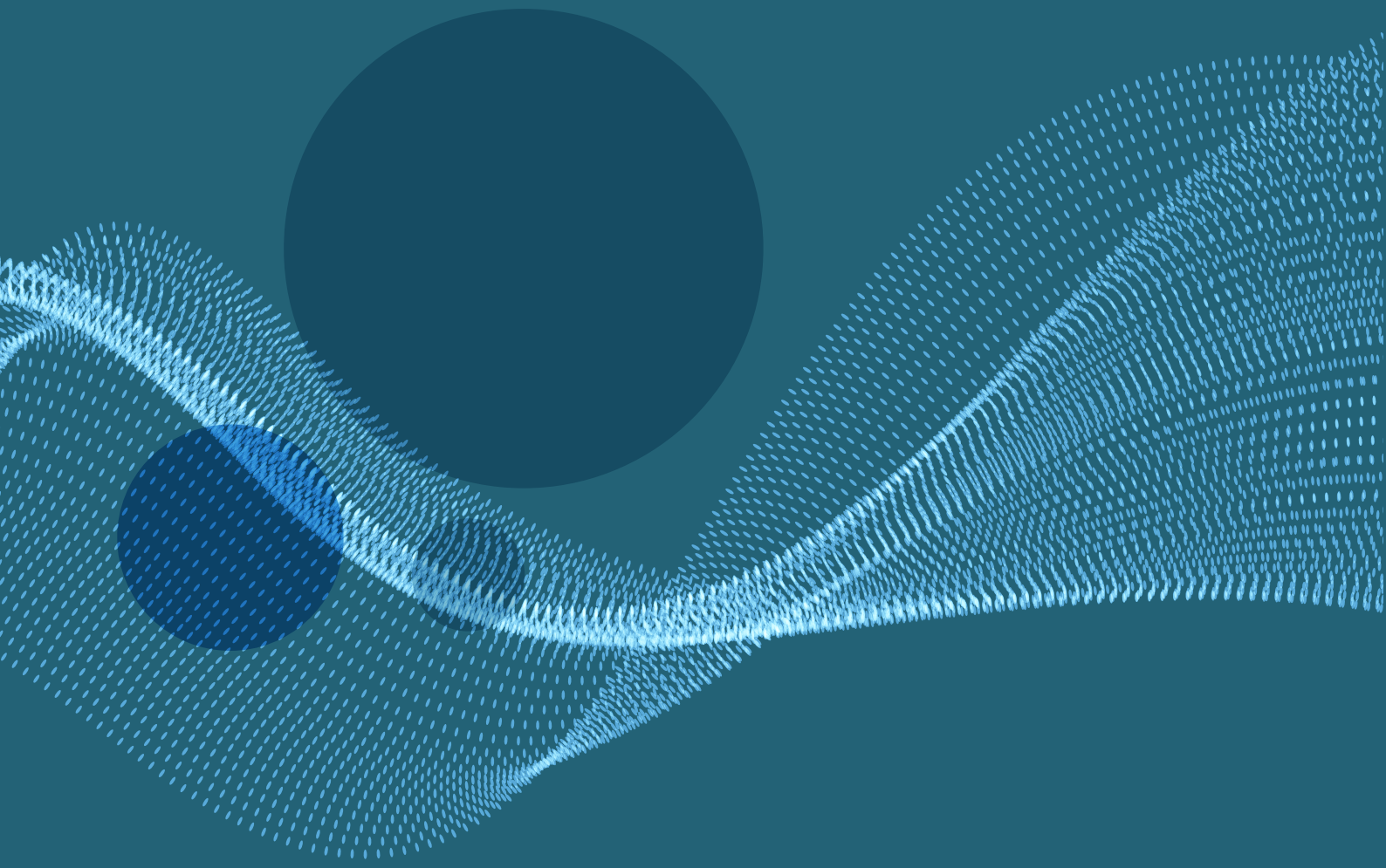


3. SURVEY HOUSEHOLD CHARACTERISTICS

3.1 BACKGROUND

This chapter presents the characteristics of the households surveyed in MPHIA 2020-2021. Household composition is described in terms of the 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.

3.2 RESULTS

The following tables and figures describe household characteristics.

Table 3.1 Household composition

Percent distribution of households by sex of head of household; median (quartile 1, quartile 3 [Q1, Q3]) size of household and median (Q1, Q3) number of children under 18 years of age by residence, MPHIA 2020-2021

Characteristic	Residence				Total	
	Urban		Rural			
	Percent	Number	Percent	Number	Percent	Number
Head of household						
Male	44.4	1,047	50.4	5,189	49.4	6,236
Female	55.6	1,324	49.6	5,255	50.6	6,579
Total	100.0	2,371	100.0	10,444	100.0	12,815

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

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

Percent distribution of the de facto household population by 5-year age groups and sex, MPHIA 2020-2021

Age	Men		Women		Total	
	Percent	Number	Percent	Number	Percent	Number
0-4	6.9	3,788	6.8	3,747	13.7	7,535
5-9	7.9	4,366	7.9	4,315	15.8	8,681
10-14	8.1	4,465	8.1	4,459	16.2	8,924
15-19	4.9	2,708	5.0	2,790	9.9	5,498
20-24	4.0	2,207	5.2	2,890	9.3	5,097
25-29	2.9	1,608	4.2	2,326	7.1	3,934
30-34	2.5	1,362	3.1	1,761	5.6	3,123
35-39	2.3	1,244	3.2	1,759	5.4	3,003
40-44	1.9	1,052	2.2	1,238	4.1	2,290
45-49	1.6	896	1.8	1,004	3.4	1,900

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

Percent distribution of the de facto household population by 5-year age groups and sex, MPHIA 2020-2021

Age	Men		Women		Total	
	Percent	Number	Percent	Number	Percent	Number
50-54	1.1	590	1.2	679	2.3	1,269
55-59	0.8	433	1.0	554	1.8	987
60-64	0.7	370	0.9	500	1.6	870
65-69	0.5	271	0.7	377	1.2	648
70-74	0.5	274	0.6	353	1.1	627
75-79	0.3	138	0.4	194	0.6	332
80+	0.3	163	0.6	326	0.9	489
Total	47.1	25,935	52.9	29,272	100.0	55,207

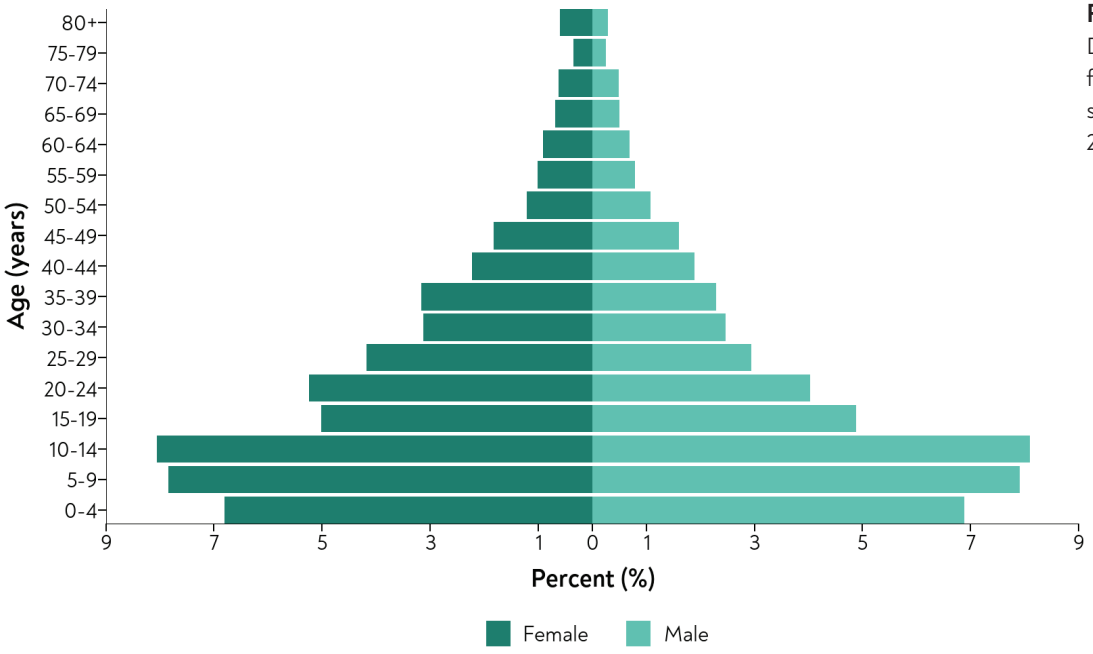


Figure 3.2
Distribution of the de facto population by sex and age, MPHIA 2020-2021

Table 3.3 Household population by age, sex, and residence

Percent distribution of the household population by age, sex, and residence, MPHIA 2020-2021

Age	Urban						Rural					
	Men		Women		Total		Men		Women		Total	
	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number
0-4	12.8	598	12.1	609	12.4	1,207	15.0	3,190	13.0	3,138	13.9	6,328
5-14	28.4	1,326	26.0	1,304	27.2	2,630	35.1	7,505	30.9	7,470	32.8	14,975
15-49	52.3	2,438	55.1	2,747	53.7	5,185	40.8	8,639	45.3	11,021	43.2	19,660
50+	6.6	310	6.8	335	6.7	645	9.1	1,929	10.8	2,648	10.0	4,577
Total	100.0	4,672	100.0	4,995	100.0	9,667	100.0	21,263	100.0	24,277	100.0	45,540

Figure 3.3
Household population by age, sex, and residence, MPHIA 2020-2021

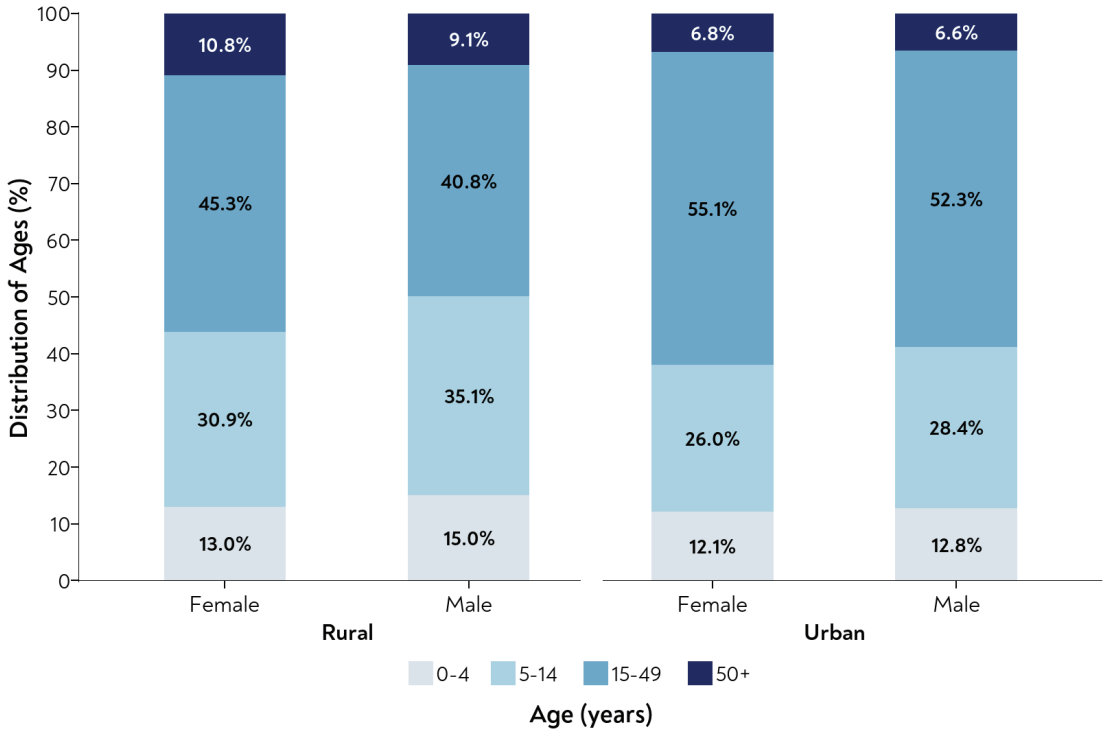


Table 3.4 Prevalence of HIV-affected households

Percentage of households with at least one HIV-positive household member by residence, MPHIA 2020-2021

Residence	Percent	Number
Urban	21.9	2,009
Rural	15.5	9,193
Total	16.6	11,202

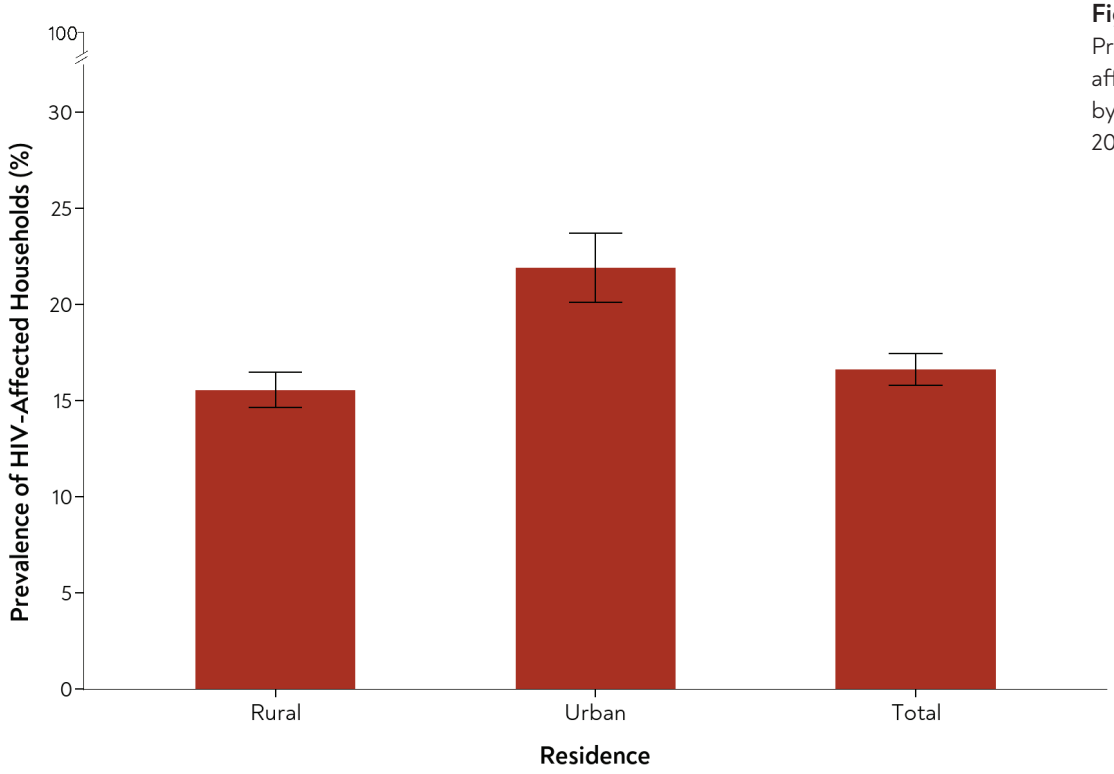
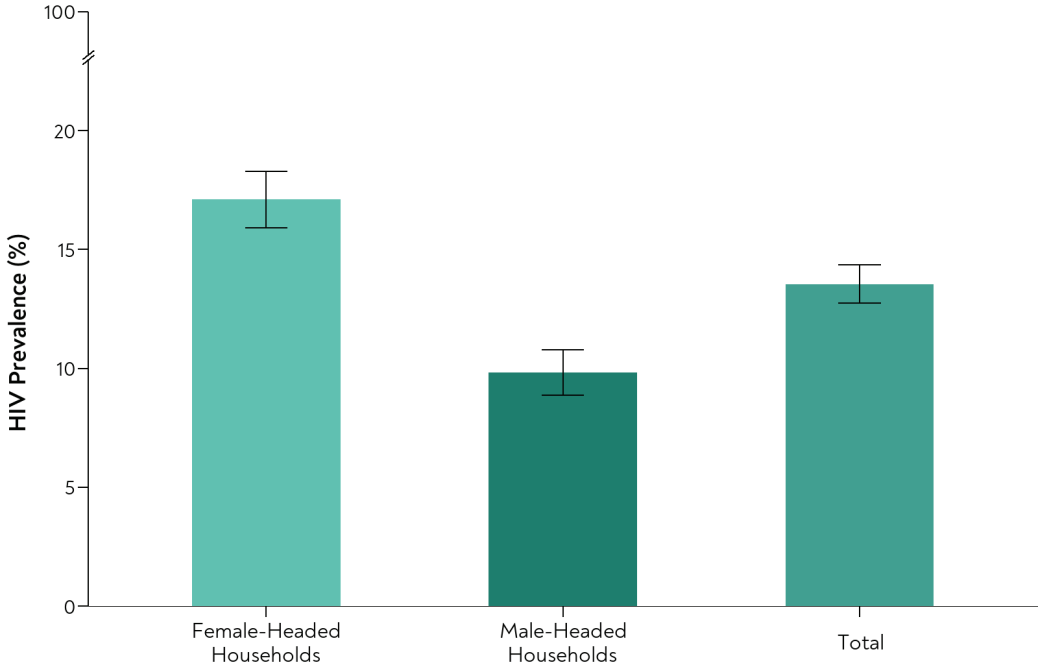


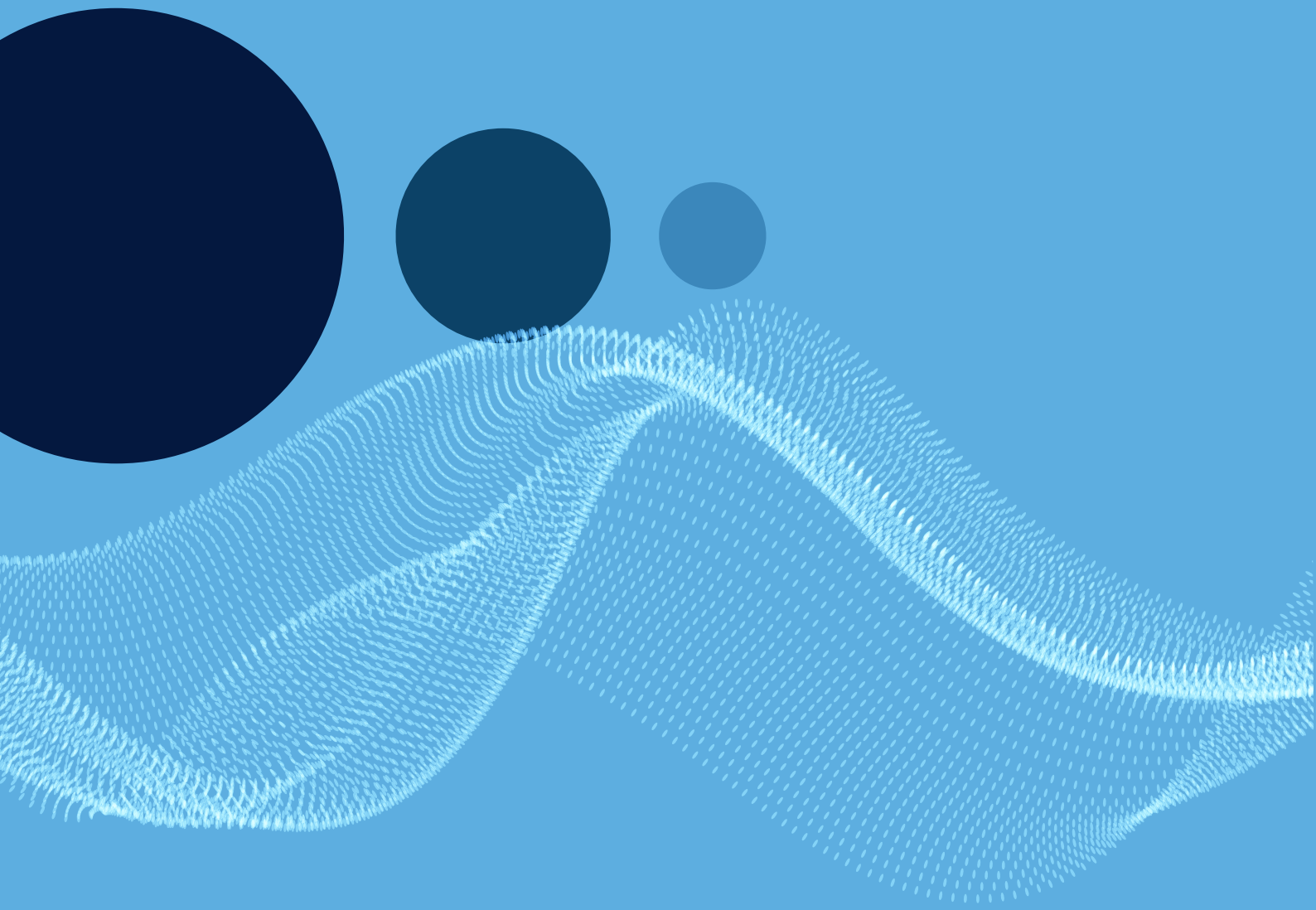
Figure 3.4
Prevalence of HIV-affected households by residence, MPHIA 2020-2021

Table 3.5 Prevalence of households with an HIV-positive head of household

Percentage of households with an HIV-positive head of household by sex of head of household, MPHIA 2020-2021		
Sex of head of household	Percent	Number
Male	9.8	4,979
Female	17.1	5,406
Total	13.5	10,385

Figure 3.5
Prevalence of HIV among heads of households, by sex, MPHIA 2020-2021





4. SURVEY RESPONDENT CHARACTERISTICS

4.1 BACKGROUND

MPHIA 2020-2021 assessed key indicators and outcomes for adults (defined as those aged 15 years and older). To provide context for these outcomes, this chapter summarizes the basic demographic and socioeconomic characteristics of survey respondents. Most key indicators in this report are stratified according to these characteristics.

4.2 RESULTS

Table 4.1 presents the demographic characteristics of MPHIA 2020-2021's respondents.

Table 4.1 Demographic characteristics of the adult population

Percent distribution of the population aged 15 years and older by sex and selected demographic characteristics, MPHIA 2020-2021

Characteristic	Men		Women		Total	
	Percent	Number	Percent	Number	Percent	Number
Residence						
Urban	18.2	2,039	17.4	2,811	17.8	4,850
Rural	81.8	9,075	82.6	12,594	82.2	21,669
Zone						
North	12.9	1,368	11.2	1,564	12.0	2,932
Central East	17.9	1,957	15.8	2,333	16.8	4,290
Central West	21.6	1,643	20.8	2,141	21.2	3,784
Lilongwe City	5.6	620	5.9	956	5.8	1,576
South East	17.5	2,351	20.7	3,822	19.2	6,173
South West	18.8	2,477	20.5	3,705	19.7	6,182
Blantyre City	5.6	698	5.1	884	5.4	1,582
Marital status						
Never married	33.7	3,557	19.9	2,531	26.4	6,088
Married or living together	60.6	6,891	58.4	9,300	59.4	16,191
Divorced or separated	4.8	539	13.5	2,197	9.4	2,736
Widowed	0.9	121	8.2	1,355	4.8	1,476
Education						
No education	6.5	768	14.0	2,252	10.4	3,020
Primary	59.4	6,628	63.8	9,725	61.7	16,353
Secondary	29.1	3,178	19.8	3,007	24.2	6,185
More than secondary	5.0	531	2.5	396	3.7	927
Wealth quintile						
Lowest	16.4	1,734	19.1	2,830	17.8	4,564
Second	18.9	2,113	18.6	2,846	18.7	4,959
Middle	19.8	2,247	20.9	3,280	20.4	5,527
Fourth	22.6	2,541	20.9	3,245	21.7	5,786
Highest	22.3	2,476	20.5	3,200	21.3	5,676
Age						
15-19	19.9	2,103	19.2	2,312	19.5	4,415
20-24	16.6	1,848	16.4	2,704	16.5	4,552
25-29	13.8	1,346	13.8	2,196	13.8	3,542

Table 4.1 Demographic characteristics of the adult population (continued)

Percent distribution of the population aged 15 years and older by sex and selected demographic characteristics, MPHIA 2020-2021

Characteristic	Men		Women		Total	
	Percent	Number	Percent	Number	Percent	Number
30-34	11.2	1,129	11.3	1,670	11.3	2,799
35-39	9.1	1,028	9.2	1,669	9.1	2,697
40-44	7.4	889	7.3	1,184	7.3	2,073
45-49	6.0	770	5.7	952	5.8	1,722
50-54	4.5	516	4.4	647	4.5	1,163
55-59	3.4	391	3.3	532	3.4	923
60-64	2.6	333	2.7	473	2.6	806
65+	5.5	761	6.6	1,066	6.1	1,827
Total 15-24	36.5	3,951	35.7	5,016	36.0	8,967
Total 15-49	84.0	9,113	83.0	12,687	83.4	21,800
Total 50+	16.0	2,001	17.0	2,718	16.6	4,719
Total 15+	100.0	11,114	100.0	15,405	100.0	26,519

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

5. HIV INCIDENCE

5.1 BACKGROUND

HIV incidence, the measure of new HIV infections in a population over time, provides important information on the status of the HIV epidemic. It can be used for effective targeted HIV prevention planning in groups that are most vulnerable to recent infection and to measure the impact of HIV prevention programs. This chapter presents annual estimates of HIV incidence among adults (ages 15 years and older) at the national level. For the purposes of this analysis, HIV incidence is expressed as the cumulative incidence or risk of new infections in a 12-month period, which is a close approximation to the instantaneous incidence rate. It is important to note that MPHIA 2020-2021 was not powered to estimate incidence at the regional level or across different sub-groups.

A laboratory-based incidence testing algorithm (HIV-1 LAg avidity plus viral load and ARV detection) was used to distinguish recent from long-term infection, and incidence estimates were obtained using the formula recommended by the WHO Incidence Working Group and Consortium for Evaluation and Performance of Incidence Assays, and with assay performance characteristics of a mean duration of recent infection = 130 days (95% CI: 118, 142), with time cutoff = 1.0 year and residual proportion false recent = 0.00. Survey weights are utilized for all estimates. All HIV-positive participants with viral loads ≥ 1,000 copies/mL were tested for recent infection using HIV-1 LAg avidity assay.

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

5.2 RESULTS

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

Table 5.1 Annual HIV incidence using the recent infection testing algorithm

Annual incidence of HIV among adults aged 15-49 and 15 years and older, by sex and age, using the recent infection testing algorithm (limiting antigen plus viral load plus antiretroviral biomarker testing), MPHIA 2020-2021

Age	Men		Women		Total	
	Percentage annual incidence[1]	95% CI	Percentage annual incidence[1]	95% CI	Percentage annual incidence[1]	95% CI
15-24	0.07	(0.00-0.22)	0.42	(0.09-0.75)	0.25	(0.06-0.44)
25-34	0.38	(0.00-0.91)	0.25	(0.00-0.55)	0.31	(0.01-0.61)
35-49	0.00	(0.00-0.51)	0.18	(0.00-0.45)	0.09	(0.00-0.24)
50+	0.00	(0.00-0.69)	0.16	(0.00-0.48)	0.09	(0.00-0.26)
15-49	0.15	(0.00-0.32)	0.31	(0.13-0.50)	0.23	(0.11-0.36)
15+	0.12	(0.00-0.27)	0.29	(0.12-0.45)	0.21	(0.10-0.32)

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

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

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

People living with HIV and number of new HIV infections per year among adults aged 15-49 years and 15 years and older, by age, using the recent infection testing algorithm (limiting antigen plus viral load plus antiretroviral biomarker testing), MPHIA 2020-2021

Age	People living with HIV[1]	95% CI	Number of new HIV infections per year	95% CI
15-24	81,000	(68,000-94,000)	9,000	(2,000-17,000)
25-34	208,000	(186,000-229,000)	8,000	(0-15,000)
35-49	421,000	(390,000-452,000)	2,000	(0-5,000)
50+	236,000	(214,000-259,000)	1,000	(0-4,000)
15-49	710,000	(665,000-754,000)	19,000	(9,000-29,000)
15+	946,000	(893,000-999,000)	20,000	(10,000-31,000)

[1] People living with HIV is calculated as the weighted total number of HIV-positive people, equivalent to multiplying the HIV prevalence by the population count.

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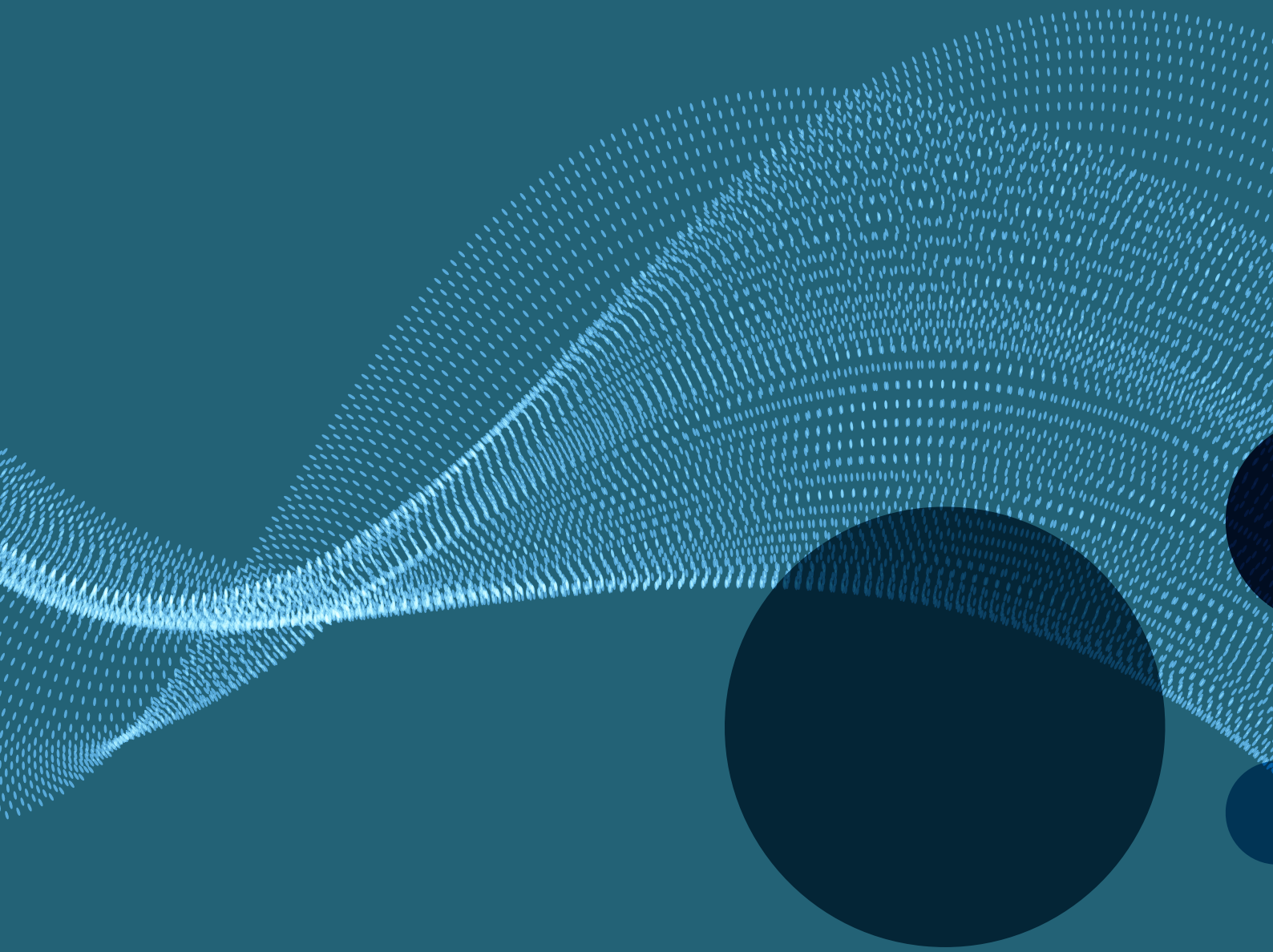

6. HIV PREVALENCE

6.1 BACKGROUND

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

6.2 RESULTS

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

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

Prevalence of HIV among adults aged 15-49 years by sex and selected demographic characteristics, MPHIA 2020-2021

Characteristic	Men		Women		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
Residence						
Urban	8.1	1,480	12.7	2,056	10.5	3,536
Rural	5.2	6,366	9.4	8,784	7.4	15,150
Zone						
North	4.5	967	6.7	1,100	5.6	2,067
Central East	2.3	1,470	4.5	1,758	3.4	3,228
Central West	3.0	1,104	4.6	1,411	3.9	2,515
Lilongwe City	7.0	433	10.7	669	9.0	1,102
South East	7.4	1,649	13.5	2,754	10.9	4,403
South West	9.9	1,711	16.1	2,507	13.3	4,218
Blantyre City	10.2	512	16.3	641	13.3	1,153
Marital status						
Never married	1.6	3,059	2.8	2,084	2.1	5,143
Married or living together	8.3	4,379	9.8	6,873	9.1	11,252
Divorced or separated	10.8	377	17.9	1,576	16.2	1,953
Widowed	(33.9)	26	42.0	299	41.2	325
Education						
No education	9.8	360	13.7	969	12.5	1,329
Primary	5.9	4,552	9.9	7,079	8.1	11,631
Secondary	5.3	2,558	9.3	2,520	7.0	5,078
More than secondary	3.7	373	5.6	263	4.4	636
Wealth quintile						
Lowest	4.7	1,260	8.1	1,996	6.6	3,256
Second	4.2	1,550	8.3	2,105	6.3	3,655
Middle	6.1	1,539	10.2	2,147	8.2	3,686
Fourth	6.8	1,732	12.0	2,254	9.4	3,986
Highest	6.8	1,764	11.1	2,336	9.0	4,100
Pregnancy status						
Currently pregnant	NA	NA	8.5	694	NA	NA
Not currently pregnant	NA	NA	10.1	10,067	NA	NA

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

Prevalence of HIV among adults aged 15-49 years by sex and selected demographic characteristics, MPHIA 2020-2021

Characteristic	Men		Women		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
Total 15-49	5.8	7,846	10.0	10,840	8.0	18,686

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

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

Prevalence of HIV among adults aged 15 years and older by sex and selected demographic characteristics, MPHIA 2020-2021

Characteristic	Men		Women		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
Residence						
Urban	10.4	1,701	13.7	2,295	12.1	3,996
Rural	6.4	7,894	9.8	10,772	8.2	18,666
Zone						
North	5.9	1,201	7.4	1,363	6.6	2,564
Central East	3.1	1,761	5.0	2,090	4.0	3,851
Central West	3.9	1,378	5.2	1,727	4.6	3,105
Lilongwe City	10.0	495	11.1	741	10.6	1,236
South East	9.0	2,044	14.0	3,315	11.8	5,359
South West	11.5	2,127	16.4	3,120	14.2	5,247
Blantyre City	11.3	589	17.1	711	14.2	1,300
Marital status						
Never married	1.6	3,080	2.9	2,136	2.1	5,216
Married or living together	9.5	5,935	9.6	7,894	9.6	13,829
Divorced or separated	12.2	471	17.7	1,904	16.4	2,375
Widowed	21.5	104	23.2	1,115	23.0	1,219
Education						
No education	9.6	651	11.7	1,796	11.1	2,447
Primary	7.4	5,757	10.6	8,377	9.1	14,134
Secondary	6.3	2,770	9.7	2,595	7.8	5,365
More than secondary	5.0	410	6.5	279	5.5	689
Wealth quintile						
Lowest	5.1	1,530	8.5	2,406	7.0	3,936
Second	5.0	1,864	8.9	2,456	7.0	4,320
Middle	7.2	1,930	10.6	2,791	9.0	4,721
Fourth	8.6	2,208	12.5	2,780	10.5	4,988
Highest	8.7	2,060	11.7	2,632	10.2	4,692
Pregnancy status						
Currently pregnant	NA	NA	8.5	700	NA	NA
Not currently pregnant	NA	NA	10.6	12,287	NA	NA
Total 15+	7.1	9,595	10.5	13,067	8.9	22,662

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

Figure 6.2.1
HIV prevalence among adults by zone, MPHIA 2020-2021

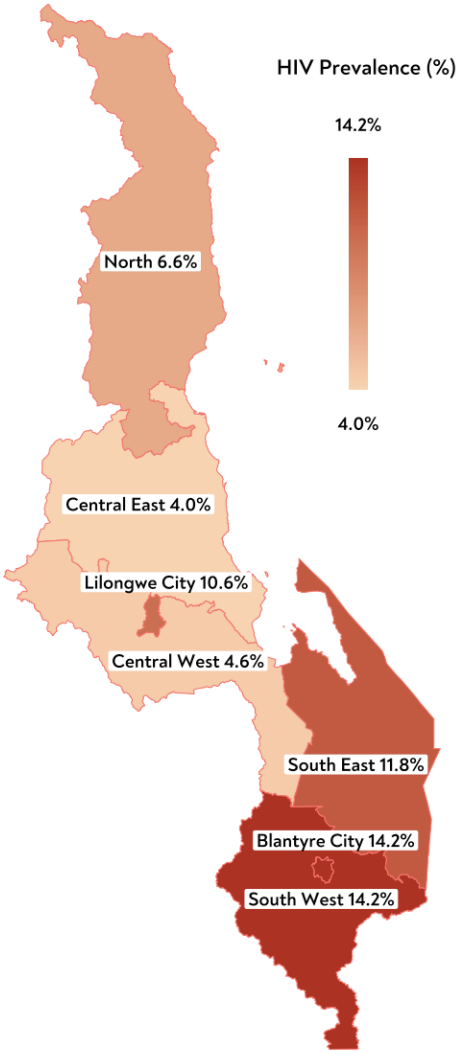

Figure 6.2.2
HIV prevalence among adults by zone, MPHIA 2020-2021

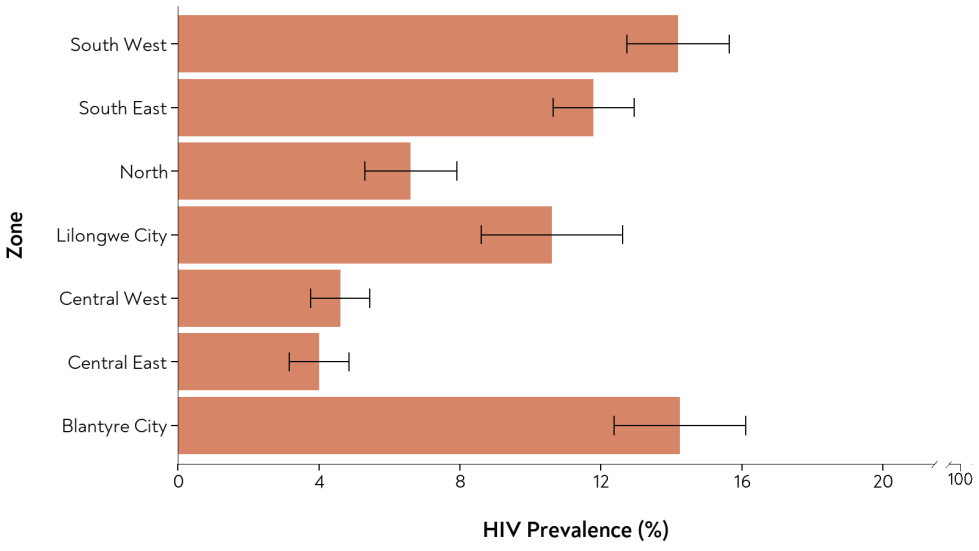

Table 6.3 HIV prevalence by age

Prevalence of HIV among adults aged 15 years and older by sex and age, MPHIA 2020-2021

Age	Men		Women		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
15-19	1.4	1,830	1.7	1,942	1.6	3,772
20-24	1.3	1,582	4.0	2,265	2.7	3,847
25-29	3.2	1,131	7.6	1,846	5.5	2,977
30-34	6.5	957	14.1	1,441	10.5	2,398
35-39	9.4	904	20.0	1,451	15.0	2,355
40-44	15.7	777	21.2	1,045	18.5	1,822
45-49	19.4	665	22.1	850	20.8	1,515
50-54	20.0	461	20.6	562	20.3	1,023
55-59	17.5	349	12.6	445	15.0	794
60-64	13.2	297	11.5	408	12.3	705
65+	7.0	642	8.5	812	7.9	1,454
Total 15-24	1.4	3,412	2.8	4,207	2.1	7,619
Total 15-49	5.8	7,846	10.0	10,840	8.0	18,686
Total 50+	14.0	1,749	12.9	2,227	13.4	3,976
Total 15+	7.1	9,595	10.5	13,067	8.9	22,662

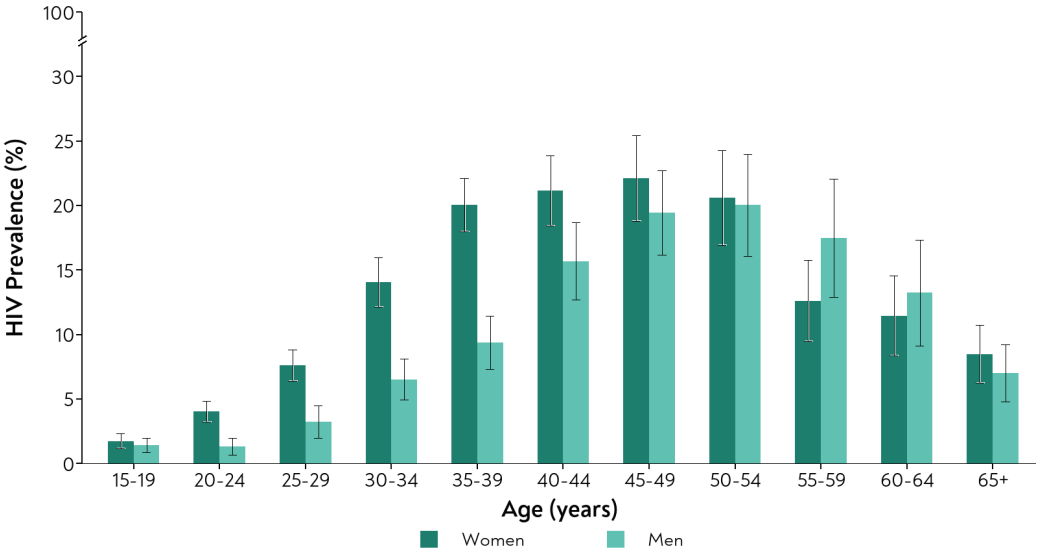

Figure 6.3
HIV prevalence by age and sex, MPHIA 2020-2021

7. HIV DIAGNOSIS AND TREATMENT

7.1 BACKGROUND

HIV testing is necessary for awareness of HIV status and is an essential component of HIV epidemic control targets. Awareness of HIV-positive status is the first step to 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 comorbidities. While many countries have expanded the uptake of HIV testing services, making certain that everyone knows their current HIV status remains a challenge. MPHIA 2020-2021 gathered data on HIV testing and awareness to help identify gaps in testing uptake, and whether there were subpopulations in need of expanded or community-based HIV testing service options such as self-testing, mobile testing, partner notification/testing, and index case testing.

Once someone has been diagnosed, current guidelines recommend that they immediately be linked to HIV treatment services to start ART as soon as possible.[1,2] Treating people living with HIV as soon as possible can improve their immune recovery and preserve health, decreasing the risk of opportunistic infections, cancers, comorbidities, and mortality. In addition, it can help them to protect their loved ones from sexual and vertical transmission of HIV. In 2016, after an extensive review of the evidence of both the clinical and population-level benefits of expanding ART, WHO changed their ART policy recommendations to "Treat All" regardless of CD4 count. By November 2017, all countries in sub-Saharan Africa had adopted this policy, despite the challenges in ensuring uptake and implementation.[2] This policy was adopted in Malawi in 2016.[3]

7.2 RESULTS

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

Tables 7.2.A-C and Figure 7.2 present the proportion of participants who tested positive in MPHIA 2020-2021 who reported awareness of their status as well as the proportion of those who were aware of their HIV-positive status who reported that they were also on ART.

Note that since participants are sometimes reluctant to reveal their HIV and treatment status in a household survey, MPHIA 2020-2021 determined whether they were taking ART, by screening their blood for the presence of selected ARVs (efavirenz, nevirapine, lopinavir, and dolutegravir) used in first- and second-line regimens in the country at the time of the survey. Since many tables in this report describe estimates among self-reported people living with HIV without adjustment for ARV detection, Tables 7.3.A-C reports the concordance of self-reported and actual ART use based upon these ARV biomarker data.

Table 7.1.A Self-reported HIV testing: Men

Percentage of men aged 15 years and older who reported they had ever received an HIV test, and percentage who reported they had received an HIV test in the 12 months before the survey, by result of MPHIA HIV test and selected demographic characteristics, MPHIA 2020-2021

Characteristic	Among all men			Among men who did not report an HIV-positive status		
	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey[1]	Number	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey[1]	Number
Result of MPHIA HIV test						
HIV positive	95.2	37.5	719	75.7	33.0	124
HIV negative	72.5	40.4	8,295	72.5	40.4	8,292
Not tested	76.6	53.3	1,409	75.9	52.9	1,352

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

Percentage of men aged 15 years and older who reported they had ever received an HIV test, and percentage who reported they had received an HIV test in the 12 months before the survey, by result of MPHIA HIV test and selected demographic characteristics, MPHIA 2020-2021

Characteristic	Among all men			Among men who did not report an HIV-positive status		
	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey[1]	Number	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey[1]	Number
Residence						
Urban	78.5	44.3	1,901	76.8	44.6	1,752
Rural	73.6	41.6	8,522	72.2	41.6	8,016
Zone						
North	71.7	42.7	1,298	70.4	42.9	1,240
Central East	67.0	37.1	1,887	66.3	36.7	1,843
Central West	70.7	41.5	1,563	69.9	41.4	1,515
Lilongwe City	77.7	43.1	585	76.0	42.9	541
South East	79.3	45.9	2,183	77.7	46.1	2,011
South West	80.3	42.2	2,277	78.1	42.8	2,043
Blantyre City	83.8	46.4	630	82.5	47.7	575
Marital status						
Never married	53.6	29.2	3,377	53.2	29.1	3,340
Married or living together	86.2	49.7	6,416	85.1	50.4	5,869
Divorced or separated	77.8	40.0	510	75.9	39.7	464
Widowed	64.7	34.8	116	57.4	33.2	91
Education						
No education	69.0	40.7	698	66.9	40.2	645
Primary	69.7	38.8	6,193	67.8	38.5	5,771
Secondary	82.9	47.2	3,022	82.1	47.9	2,863
More than secondary	88.7	52.7	501	88.3	53.3	481
Wealth quintile						
Lowest	70.9	41.5	1,641	69.9	41.5	1,571
Second	74.1	42.0	1,990	72.9	41.9	1,894
Middle	73.7	41.6	2,092	72.1	42.0	1,953
Fourth	73.4	39.9	2,379	71.5	40.0	2,201
Highest	79.3	45.2	2,319	77.9	45.2	2,148
Age						
15-19	42.9	22.3	1,994	42.4	22.2	1,976
20-24	75.4	47.4	1,743	75.2	47.3	1,730
25-29	87.4	54.4	1,274	87.1	54.5	1,249
30-34	88.9	53.0	1,067	88.4	53.6	1,017
35-39	87.7	49.8	969	86.7	50.0	897
40-44	88.8	46.7	822	87.1	48.9	701
45-49	84.5	44.0	721	81.6	44.5	596
50-54	83.1	40.2	483	79.3	40.2	388
55-59	77.8	33.7	361	74.2	34.4	304

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

Percentage of men aged 15 years and older who reported they had ever received an HIV test, and percentage who reported they had received an HIV test in the 12 months before the survey, by result of MPHIA HIV test and selected demographic characteristics, MPHIA 2020-2021

Characteristic	Among all men			Among men who did not report an HIV-positive status		
	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey[1]	Number	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey[1]	Number
60-64	76.6	40.4	301	73.9	40.1	262
65+	62.9	30.3	688	60.6	28.7	648
Total 15-24	57.6	33.7	3,737	57.3	33.6	3,706
Total 15-49	74.6	43.3	8,590	73.4	43.4	8,166
Total 50+	74.1	35.5	1,833	70.6	34.8	1,602
Total 15+	74.5	42.1	10,423	73.0	42.1	9,768

[1] Relates to PEPFAR indicator HTS_TST: Number of individuals who received HIV testing services and received their test results.
Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Table 7.1.B Self-reported HIV testing: Women

Percentage of women aged 15 years and older who reported they had ever received an HIV test, and percentage who reported they had received an HIV test in the 12 months before the survey, by result of MPHIA HIV test and selected demographic characteristics, MPHIA 2020-2021

Characteristic	Among all women			Among women who did not report an HIV-positive status		
	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey[1]	Number	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey[1]	Number
Result of MPHIA HIV test						
HIV positive	97.8	36.9	1,562	84.8	36.0	168
HIV negative	81.6	49.8	10,578	81.6	49.8	10,572
Not tested	83.2	62.5	2,161	82.5	63.0	2,065
Residence						
Urban	86.5	54.2	2,611	84.8	56.3	2,277
Rural	82.7	49.8	11,690	81.1	51.0	10,528
Zone						
North	80.6	47.8	1,485	79.3	48.1	1,388
Central East	79.1	48.4	2,231	78.2	48.7	2,140
Central West	77.8	47.7	2,026	76.7	48.1	1,921
Lilongwe City	86.4	58.5	893	85.0	59.6	794
South East	88.3	55.3	3,475	86.7	57.7	3,025
South West	87.0	49.4	3,390	84.8	51.9	2,859
Blantyre City	89.3	52.5	801	87.6	57.1	678

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

Percentage of women aged 15 years and older who reported they had ever received an HIV test, and percentage who reported they had received an HIV test in the 12 months before the survey, by result of MPHIA HIV test and selected demographic characteristics, MPHIA 2020-2021

Characteristic	Among all women			Among women who did not report an HIV-positive status		
	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey[1]	Number	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey[1]	Number
Marital status						
Never married	51.4	34.6	2,390	50.4	34.5	2,328
Married or living together	94.2	58.0	8,656	93.7	59.9	7,841
Divorced or separated	92.8	55.1	2,026	91.5	57.6	1,689
Widowed	69.4	29.0	1,208	61.2	28.6	926
Education						
No education	77.7	44.5	2,027	75.0	45.0	1,782
Primary	83.3	50.4	9,017	81.7	51.5	8,059
Secondary	86.4	54.0	2,856	85.3	55.9	2,587
More than secondary	92.0	62.1	381	91.5	64.1	358
Wealth quintile						
Lowest	82.1	51.4	2,640	80.6	52.0	2,414
Second	84.4	52.8	2,656	83.1	53.9	2,423
Middle	82.2	47.6	3,012	80.5	49.2	2,692
Fourth	82.1	48.4	3,003	79.9	49.6	2,634
Highest	86.3	53.0	2,987	84.8	54.9	2,640
Age						
15-19	53.2	38.0	2,184	52.7	37.9	2,156
20-24	94.6	65.1	2,550	94.4	65.5	2,478
25-29	98.2	65.6	2,069	98.1	66.8	1,937
30-34	98.3	59.3	1,565	98.0	62.2	1,355
35-39	97.8	55.0	1,569	97.3	58.3	1,259
40-44	95.3	48.3	1,097	94.3	53.1	854
45-49	92.7	44.2	868	91.1	47.0	669
50-54	86.8	42.4	589	83.4	44.4	462
55-59	79.5	38.7	473	76.6	38.7	409
60-64	65.6	31.0	410	61.7	31.5	365
65+	50.8	23.2	927	47.2	21.7	861
Total 15-24	72.3	50.5	4,734	71.8	50.5	4,634
Total 15-49	86.3	54.1	11,902	85.1	55.6	10,708
Total 50+	68.3	32.6	2,399	64.0	32.0	2,097
Total 15+	83.4	50.6	14,301	81.8	51.9	12,805

[1] Relates to PEPFAR indicator HTS_TST: Number of individuals who received HIV testing services and received their test results.
Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Table 7.1.C Self-reported HIV testing: Total

Percentage of adults aged 15 years and older who reported they had ever received an HIV test, and percentage who reported that they received an HIV test in the 12 months before the survey, by result of MPHIA HIV test and selected demographic characteristics, MPHIA 2020-2021

Characteristic	Among all adults			Among adults who did not report an HIV-positive status		
	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey[1]	Number	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey[1]	Number
Result of MPHIA HIV test						
HIV positive	96.9	37.1	2,281	80.3	34.5	292
HIV negative	77.1	45.2	18,873	77.1	45.2	18,864
Not tested	80.2	58.4	3,570	79.5	58.4	3,417
Residence						
Urban	82.6	49.4	4,512	80.8	50.5	4,029
Rural	78.4	45.9	20,212	76.8	46.4	18,544
Zone						
North	76.1	45.2	2,783	74.7	45.4	2,628
Central East	72.9	42.6	4,118	72.1	42.6	3,983
Central West	74.4	44.7	3,589	73.3	44.8	3,436
Lilongwe City	82.4	51.4	1,478	80.8	51.8	1,335
South East	84.3	51.2	5,658	82.6	52.5	5,036
South West	84.0	46.1	5,667	81.7	47.6	4,902
Blantyre City	86.6	49.5	1,431	85.0	52.3	1,253
Marital status						
Never married	52.7	31.4	5,767	52.1	31.2	5,668
Married or living together	90.3	54.0	15,072	89.5	55.3	13,710
Divorced or separated	89.1	51.4	2,536	87.4	52.9	2,153
Widowed	69.0	29.5	1,324	60.8	29.0	1,017
Education						
No education	75.1	43.4	2,725	72.5	43.5	2,427
Primary	77.1	45.1	15,210	75.2	45.5	13,830
Secondary	84.4	50.1	5,878	83.4	51.3	5,450
More than secondary	89.9	56.1	882	89.4	57.1	839
Wealth quintile						
Lowest	77.2	47.1	4,281	75.8	47.3	3,985
Second	79.5	47.6	4,646	78.1	48.0	4,317
Middle	78.2	44.8	5,104	76.5	45.8	4,645
Fourth	77.8	44.1	5,382	75.7	44.7	4,835
Highest	82.8	49.2	5,306	81.3	50.0	4,788
Age						
15-19	48.2	30.4	4,178	47.8	30.3	4,132
20-24	85.4	56.7	4,293	85.2	56.7	4,208
25-29	93.1	60.3	3,343	92.8	60.8	3,186

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

Percentage of adults aged 15 years and older who reported they had ever received an HIV test, and percentage who reported that they received an HIV test in the 12 months before the survey, by result of MPHIA HIV test and selected demographic characteristics, MPHIA 2020-2021

Characteristic	Among all adults			Among adults who did not report an HIV-positive status		
	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey[1]	Number	Percentage who had ever received an HIV test	Percentage who received an HIV test in the 12 months before the survey[1]	Number
30-34	93.8	56.3	2,632	93.2	57.9	2,372
35-39	93.0	52.6	2,538	92.0	54.1	2,156
40-44	92.2	47.5	1,919	90.7	51.0	1,555
45-49	88.7	44.1	1,589	86.3	45.7	1,265
50-54	85.0	41.4	1,072	81.4	42.3	850
55-59	78.7	36.3	834	75.4	36.6	713
60-64	70.8	35.5	711	67.5	35.6	627
65+	56.1	26.3	1,615	53.1	24.7	1,509
Total 15-24	65.2	42.4	8,471	64.8	42.3	8,340
Total 15-49	80.7	48.9	20,492	79.4	49.6	18,874
Total 50+	71.0	34.0	4,232	67.1	33.3	3,699
Total 15+	79.2	46.5	24,724	77.5	47.1	22,573

[1] Relates to PEPFAR indicator HTS_TST: Number of individuals who received HIV testing services and received their test results.
Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Figure 7.1
Proportion of adults who reported having received an HIV test in the 12 months before the survey by age and sex, MPHIA 2020-2021

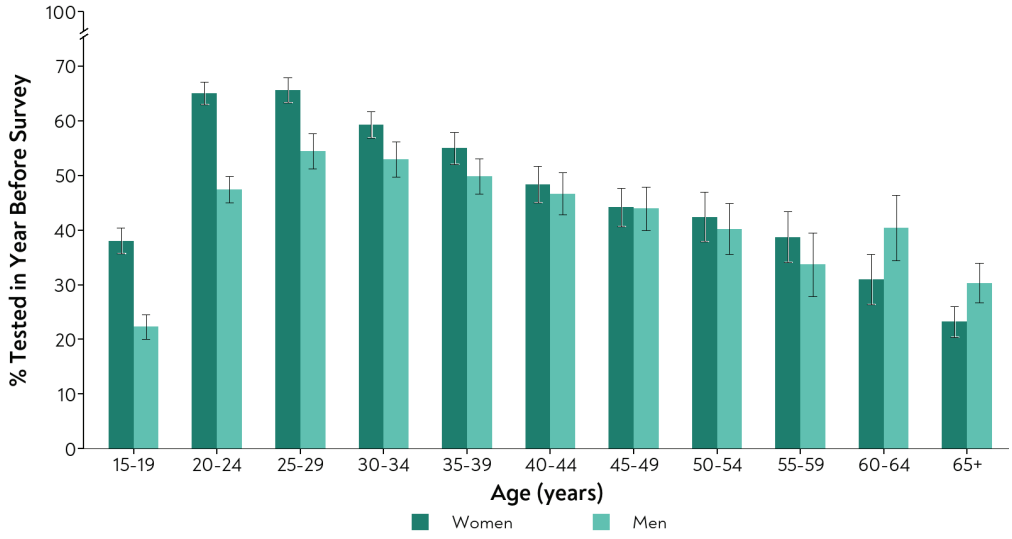

Table 7.2.A HIV diagnosis and treatment status: Men

Percent distribution of HIV-positive men, aged 15 years and older, diagnosed and on treatment based on self-reported HIV status and antiretroviral therapy (ART) use (adjusted by detection of an antiretroviral in blood), by selected demographic characteristics, MPHIA 2020-2021

Characteristic	Unaware of HIV status	Aware of HIV status and not on ART	Aware of HIV status and on ART[1]	Total	Number
Residence					
Urban	16.4	3.3	80.3	100.0	185
Rural	14.5	1.8	83.7	100.0	583
Zone					
North	17.3	2.5	80.3	100.0	71
Central East	20.8	0.0	79.2	100.0	59
Central West	25.1	6.5	68.3	100.0	59
Lilongwe City	16.3	2.1	81.7	100.0	50
South East	9.8	1.2	89.0	100.0	199
South West	11.7	1.3	87.0	100.0	261
Blantyre City	16.9	3.7	79.4	100.0	69
Marital status					
Never married	16.5	4.9	78.5	100.0	53
Married or living together	14.2	2.2	83.6	100.0	624
Divorced or separated	23.7	0.0	76.3	100.0	64
Widowed	(8.9)	(0.0)	(91.1)	(100.0)	27
Education					
No education	19.6	1.8	78.6	100.0	68
Primary	14.1	1.9	84.0	100.0	482
Secondary	14.0	3.2	82.8	100.0	194
More than secondary	*	*	*	*	23
Wealth quintile					
Lowest	21.1	5.0	73.9	100.0	87
Second	13.1	2.2	84.7	100.0	110
Middle	15.3	2.5	82.2	100.0	160
Fourth	14.9	1.9	83.2	100.0	209
Highest	13.2	1.0	85.8	100.0	201
Age					
15-19	(8.5)	(6.3)	(85.2)	(100.0)	28
20-24	*	*	*	*	23
25-29	(32.4)	(0.0)	(67.6)	(100.0)	37
30-34	29.3	5.5	65.2	100.0	68
35-39	17.9	0.0	82.1	100.0	87
40-44	9.2	4.2	86.6	100.0	132
45-49	8.3	1.1	90.6	100.0	141
50-54	5.7	2.2	92.1	100.0	98
55-59	9.4	2.8	87.8	100.0	64
60-64	(16.5)	(0.0)	(83.5)	(100.0)	45
65+	(17.8)	(0.0)	(82.2)	(100.0)	45

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

Percent distribution of HIV-positive men, aged 15 years and older, diagnosed and on treatment based on self-reported HIV status and antiretroviral therapy (ART) use (adjusted by detection of an antiretroviral in blood), by selected demographic characteristics, MPHIA 2020-2021

Characteristic	Unaware of HIV status	Aware of HIV status and not on ART	Aware of HIV status and on ART[1]	Total	Number
Total 15-24	22.8	3.6	73.6	100.0	51
Total 15-49	17.1	2.5	80.4	100.0	516
Total 50+	10.5	1.6	87.9	100.0	252
Total 15+	15.0	2.2	82.8	100.0	768

[1] Relates to Global AIDS Monitoring 2021 indicator 1.2: People living with HIV on ART; and PEPFAR indicator TX_CURR_NAT / SUBNAT: Percentage of adults and children currently receiving ART.
* Estimates based on a denominator less than 25 have been suppressed.
( ) Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.
Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Table 7.2.B HIV diagnosis and treatment status: Women

Percent distribution of HIV-positive women, aged 15 years and older, diagnosed and on treatment based on self-reported HIV status and antiretroviral therapy (ART) use (adjusted by detection of an antiretroviral in blood), by selected demographic characteristics, MPHIA 2020-2021

Characteristic	Unaware of HIV status	Aware of HIV status and not on ART	Aware of HIV status and on ART[1]	Total	Number
Residence					
Urban	10.7	2.6	86.8	100.0	373
Rural	9.3	1.4	89.3	100.0	1,320
Zone					
North	9.6	3.4	87.0	100.0	112
Central East	14.5	0.0	85.5	100.0	112
Central West	6.8	3.6	89.6	100.0	109
Lilongwe City	15.0	5.0	80.0	100.0	103
South East	8.4	0.8	90.7	100.0	514
South West	9.2	1.1	89.7	100.0	598
Blantyre City	10.4	1.5	88.0	100.0	145
Marital status					
Never married	20.4	1.0	78.6	100.0	84
Married or living together	9.2	1.6	89.2	100.0	899
Divorced or separated	11.4	2.4	86.2	100.0	393
Widowed	5.0	1.2	93.9	100.0	316
Education					
No education	5.4	0.3	94.3	100.0	260
Primary	9.3	1.8	88.9	100.0	1,096
Secondary	13.1	2.3	84.6	100.0	313
More than secondary	*	*	*	*	22
Wealth quintile					
Lowest	9.1	2.8	88.0	100.0	256
Second	10.5	1.5	88.0	100.0	266
Middle	9.8	1.2	88.9	100.0	367

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

Percent distribution of HIV-positive women, aged 15 years and older, diagnosed and on treatment based on self-reported HIV status and antiretroviral therapy (ART) use (adjusted by detection of an antiretroviral in blood), by selected demographic characteristics, MPHIA 2020-2021

Characteristic	Unaware of HIV status	Aware of HIV status and not on ART	Aware of HIV status and on ART[1]	Total	Number
Fourth	8.4	0.4	91.2	100.0	421
Highest	10.4	2.7	86.8	100.0	382
Age					
15-19	(21.5)	(2.4)	(76.1)	(100.0)	42
20-24	25.6	3.1	71.3	100.0	108
25-29	19.1	3.7	77.2	100.0	166
30-34	11.2	1.9	86.8	100.0	235
35-39	6.9	1.2	92.0	100.0	330
40-44	4.2	1.8	94.0	100.0	255
45-49	3.6	0.8	95.7	100.0	219
50-54	4.6	0.8	94.6	100.0	132
55-59	10.3	1.1	88.6	100.0	71
60-64	4.3	1.5	94.2	100.0	56
65+	9.1	0.0	90.9	100.0	79
Total 15-24	24.2	2.9	72.9	100.0	150
Total 15-49	10.4	1.9	87.8	100.0	1,355
Total 50+	6.8	0.8	92.4	100.0	338
Total 15+	9.6	1.7	88.7	100.0	1,693

[1] Relates to Global AIDS Monitoring 2021 indicator 1.2: People living with HIV on ART and PEPFAR indicator TX_CURR_NAT / SUBNAT: Percentage of adults and children currently receiving ART.
* Estimates based on a denominator less than 25 have been suppressed.
( ) Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.
Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Table 7.2.C HIV diagnosis and treatment status: Total

Percent distribution of HIV-positive adults, aged 15 years and older, diagnosed and on treatment based on self-reported HIV status and antiretroviral therapy (ART) use (adjusted by detection of an antiretroviral in blood), by selected demographic characteristics, MPHIA 2020-2021

Characteristic	Unaware of HIV status	Aware of HIV status and not on ART	Aware of HIV status and on ART[1]	Total	Number
Residence					
Urban	13.1	2.8	84.1	100.0	558
Rural	11.2	1.6	87.2	100.0	1,903
Zone					
North	13.1	3.0	83.9	100.0	183
Central East	17.0	0.0	83.0	100.0	171
Central West	14.3	4.8	80.9	100.0	168
Lilongwe City	15.5	3.7	80.7	100.0	153
South East	8.9	1.0	90.1	100.0	713

Table 7.2.C HIV diagnosis and treatment status: Total (continued)

Percent distribution of HIV-positive adults, aged 15 years and older, diagnosed and on treatment based on self-reported HIV status and antiretroviral therapy (ART) use (adjusted by detection of an antiretroviral in blood), by selected demographic characteristics, MPHIA 2020-2021

Characteristic	Unaware of HIV status	Aware of HIV status and not on ART	Aware of HIV status and on ART[1]	Total	Number
South West	10.1	1.2	88.7	100.0	859
Blantyre City	13.0	2.4	84.7	100.0	214
Marital status					
Never married	18.6	2.8	78.6	100.0	137
Married or living together	11.6	1.9	86.5	100.0	1,523
Divorced or separated	13.5	2.0	84.5	100.0	457
Widowed	5.3	1.1	93.6	100.0	343
Education					
No education	9.1	0.7	90.2	100.0	328
Primary	11.1	1.9	87.1	100.0	1,578
Secondary	13.5	2.7	83.7	100.0	507
More than secondary	(26.6)	(0.0)	(73.4)	(100.0)	45
Wealth quintile					
Lowest	13.0	3.5	83.5	100.0	343
Second	11.4	1.7	86.9	100.0	376
Middle	11.8	1.7	86.5	100.0	527
Fourth	11.0	1.0	88.0	100.0	630
Highest	11.6	2.0	86.4	100.0	583
Age					
15-19	15.9	4.1	80.1	100.0	70
20-24	29.2	2.4	68.4	100.0	131
25-29	22.8	2.7	74.5	100.0	203
30-34	16.5	3.0	80.5	100.0	303
35-39	10.1	0.8	89.1	100.0	417
40-44	6.2	2.8	91.0	100.0	387
45-49	5.7	0.9	93.4	100.0	360
50-54	5.1	1.5	93.4	100.0	230
55-59	9.8	2.1	88.1	100.0	135
60-64	10.4	0.8	88.8	100.0	101
65+	12.4	0.0	87.6	100.0	124
Total 15-24	23.8	3.1	73.1	100.0	201
Total 15-49	12.7	2.1	85.2	100.0	1,871
Total 50+	8.6	1.2	90.3	100.0	590
Total 15+	11.7	1.9	86.5	100.0	2,461

[1]Relates to Global AIDS Monitoring 2021 indicator 1.2: People living with HIV on ART; and PEPFAR indicator TX_CURR_NAT / SUBNAT: Percentage of adults and children currently receiving ART.
( ) Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.
Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

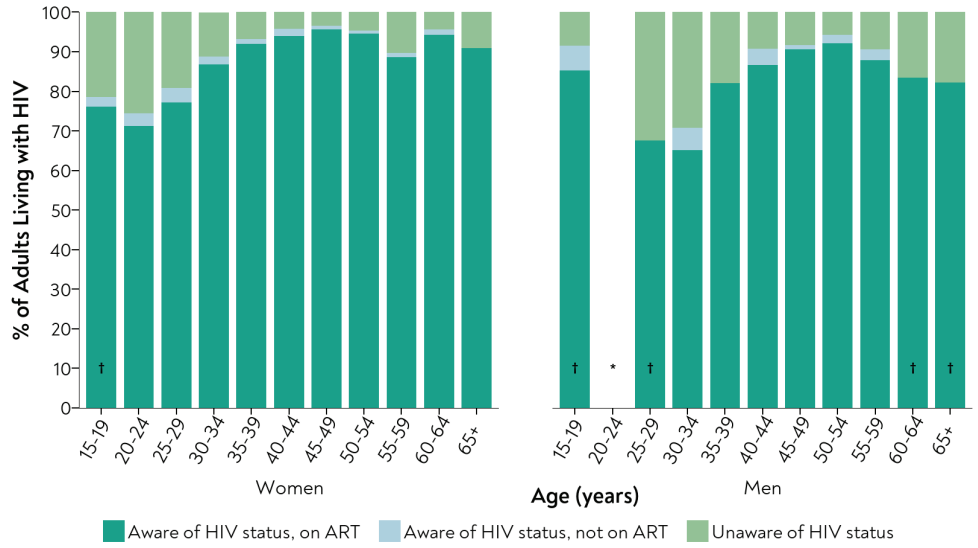

Figure 7.2
Proportion of adults living with HIV aware of their HIV status and on antiretroviral therapy, based upon self-report or having a detectable antiretroviral in blood, by sex and age, MPHIA 2020-2021

Abbreviation: ART, antiretroviral therapy.
Estimates based on a denominator less than 25 have been suppressed with an asterisk.
Estimates based on a denominator between 25 and 49 are marked by a dagger and should be interpreted with caution.

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

Percent distribution of HIV-positive men aged 15 years and older by presence of detectable antiretrovirals (ARVs) versus self-reported HIV treatment status, MPHIA 2020-2021

Characteristic	ARV status		Total	Number
	Not detectable	Detectable		
Self-reported treatment status				
Not previously diagnosed	79.9	20.1	100.0	134
Previously diagnosed, not on ART	*	*	*	17
Previously diagnosed, on ART	3.3	96.7	100.0	617
Total 15-24	30.1	69.9	100.0	51
Total 15-49	22.1	77.9	100.0	516
Total 50+	14.8	85.2	100.0	252
Total 15+	19.8	80.2	100.0	768

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

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

Percent distribution of HIV-positive women aged 15 years and older by presence of detectable antiretrovirals (ARVs) versus self-reported HIV treatment status, MPHIA 2020-2021

Characteristic	ARV status		Total	Number
	Not detectable	Detectable		
Self-reported treatment status				
Not previously diagnosed	80.5	19.5	100.0	179
Previously diagnosed, not on ART	(87.4)	(12.6)	(100.0)	31
Previously diagnosed, on ART	4.4	95.6	100.0	1,481
Total 15-24	36.2	63.8	100.0	150
Total 15-49	16.9	83.1	100.0	1,355
Total 50+	8.1	91.9	100.0	338
Total 15+	15.1	84.9	100.0	1,693

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

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

Percent distribution of HIV-positive adults aged 15 years and older by presence of detectable antiretrovirals (ARVs) versus self-reported HIV treatment status, MPHIA 2020-2021

Characteristic	ARV status		Total	Number
	Not detectable	Detectable		
Self-reported treatment status				
Not previously diagnosed	80.2	19.8	100.0	313
Previously diagnosed, not on ART	(87.7)	(12.3)	(100.0)	48
Previously diagnosed, on ART	4.0	96.0	100.0	2,098
Total 15-24	34.3	65.7	100.0	201
Total 15-49	18.7	81.3	100.0	1,871
Total 50+	11.3	88.7	100.0	590
Total 15+	16.9	83.1	100.0	2,461

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

7.3 REFERENCES

1. World Health Organization. *Consolidated guidelines on HIV prevention, testing, treatment, service delivery and monitoring: recommendations for a public health approach.* Geneva: World Health Organization; 2021. https://www.who.int/publications/i/item/9789240031593. Accessed February 1, 2022.

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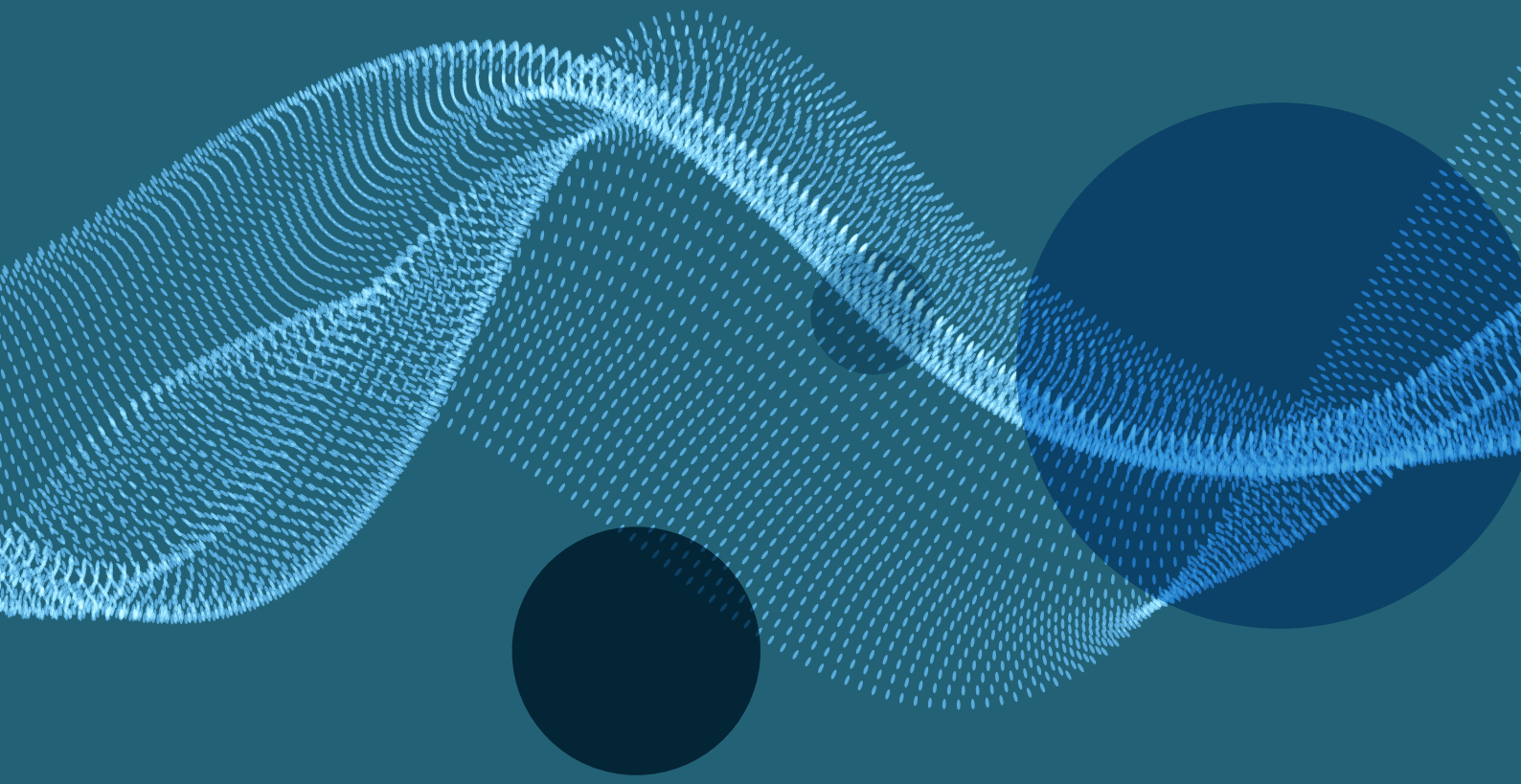

8. VIRAL LOAD SUPPRESSION

8.1 BACKGROUND

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

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

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

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

MPHIA 2020-2021 also reports on the proportion of people living with HIV with a viral load of less than 200 copies/mL. Although the current definition for VLS serves as a benchmark for monitoring global targets over time, using a lower viral load threshold for clinical monitoring has other potential benefits. Studies have shown that low level viremia (detectable ongoing viral replication at levels below 1,000 copies/mL) is associated with a significant risk of subsequent treatment failure and drug resistance.[6,7] WHO guidelines recommend enhanced adherence support for those with low level viremia, as well as repeat viral load monitoring at 3 months.[4]

Finally, MPHIA 2020-2021 also evaluated access to viral load tests and receipt of results among people living with HIV in Malawi. In addition to the clinical benefits that viral load monitoring offers, knowing one's own viral load could also help protect a sexual partner from HIV. Several recent studies of couples in which one partner had HIV and the other did not, found that there was no HIV transmission despite sexual activity when viral load was sustained below 200 copies/mL.[8] In addition, a recent WHO review of the HIV transmission on ART studies found low level viremia was not associated with sexual transmission.[4] These studies serve as the basis of the U=U (Undetectable = Untransmittable) strategy, which encourages people living with HIV on ART to maintain an undetectable viral load* for their own health and to eliminate the risk of HIV transmission to their sexual partners.[4]

8.2 RESULTS

The following tables and figures present VLS data of people living with HIV in Malawi, population viremia by health zone, and other viral load data at the time of the MPHIA 2020-2021 survey.

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

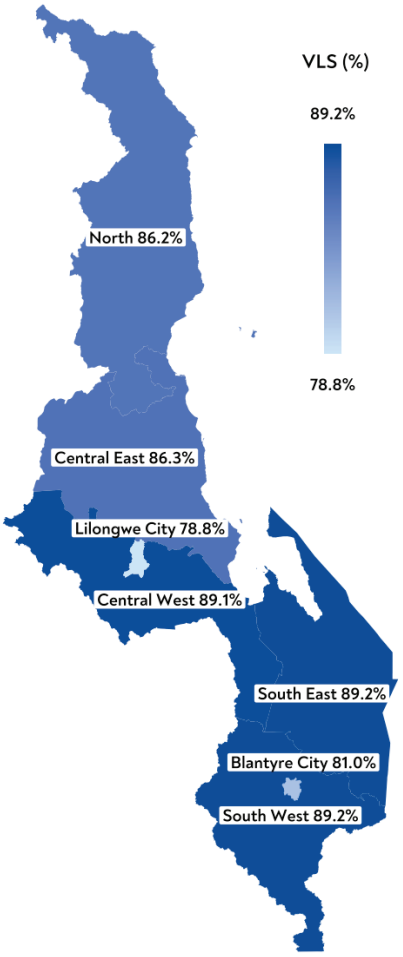
Table 8.1 Viral load suppression (HIV RNA < 1,000 copies per milliliter) by demographic characteristics

Among HIV-positive adults aged 15 years and older, percentage with viral load suppression (VLS), by sex, self-reported HIV diagnosis and antiretroviral therapy (ART) use (adjusted by antiretroviral [ARV] biomarker testing), and selected demographic characteristics, MPHIA 2020-2021

Characteristic	Men		Women		Total	
	Percentage with VLS[1]	Number	Percentage with VLS[1]	Number	Percentage with VLS[1]	Number
HIV diagnosis and treatment status[2]						
Unaware of HIV status	32.6	106	22.7	147	27.5	253
Aware of HIV status and not on ART	*	14	(9.3)	27	(15.3)	41
Aware of HIV status and on ART	96.8	648	96.9	1,519	96.9	2,167
Residence						
Urban	79.6	185	82.6	373	81.4	558
Rural	87.6	583	90.0	1,320	89.1	1,903
Zone						
North	86.2	71	86.2	112	86.2	183
Central East	82.2	59	88.8	112	86.3	171
Central West	85.9	59	91.4	109	89.1	168
Lilongwe City	81.8	50	76.5	103	78.8	153
South East	87.7	199	89.9	514	89.2	713
South West	87.9	261	89.9	598	89.2	859
Blantyre City	76.5	69	84.0	145	81.0	214
Marital status						
Never married	71.1	53	74.0	84	72.7	137
Married or living together	87.4	624	88.5	899	88.0	1,523
Divorced or separated	79.8	64	87.5	393	86.2	457
Widowed	(87.2)	27	93.8	316	93.2	343
Education						
No education	83.2	68	93.2	260	90.6	328
Primary	88.1	482	89.2	1,096	88.8	1,578
Secondary	82.1	194	82.5	313	82.3	507
More than secondary	*	23	*	22	(70.1)	45
Wealth quintile						
Lowest	87.0	87	88.2	256	87.8	343
Second	85.5	110	89.6	266	88.2	376
Middle	84.9	160	90.1	367	88.2	527
Fourth	85.6	209	89.3	421	87.8	630
Highest	85.2	201	84.9	382	85.0	583
Total 15-24						
Total 15-49	83.0	516	87.1	1,355	85.7	1,871
Total 50+	90.9	252	93.0	338	92.0	590
Total 15+	85.5	768	88.4	1,693	87.3	2,461

[1] Relates to Global AIDS Monitoring 2021 indicator 1.3: People living with HIV who have suppressed viral loads.
[2] Both awareness of HIV-positive status and on treatment status were based upon self-report or having a detectable ARV in the blood.
* Estimates based on a denominator less than 25 have been suppressed.
( ) Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.
Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Figure 8.1.1
Viral load suppression among HIV-positive adults 15 years and older, by zone, MPHIA 2020-2021



Abbreviation: VLS, viral load suppression.

Figure 8.1.2
Viral load suppression among HIV-positive adults 15 years and older by zone, MPHIA 2020-2021

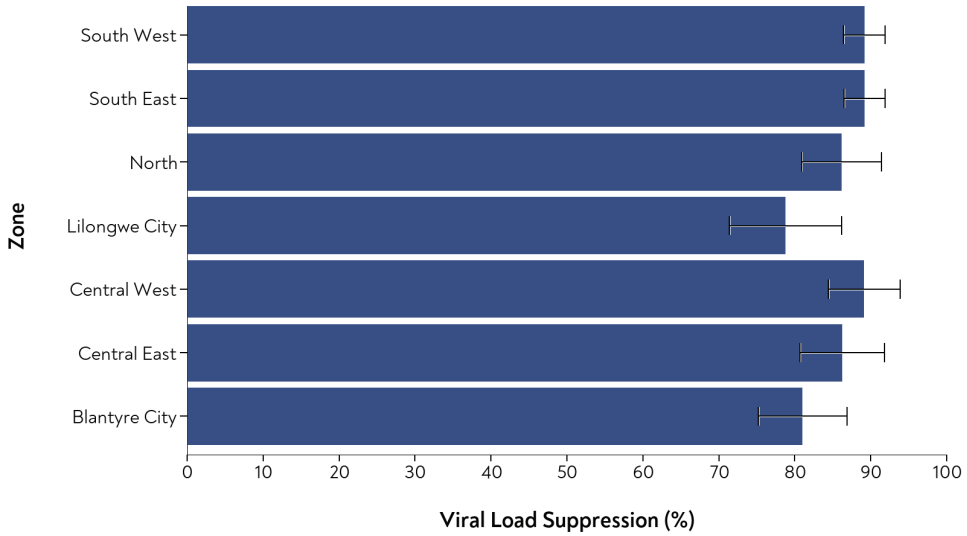


Table 8.2 Viral load suppression (HIV RNA < 1,000 copies per milliliter) by age and sex

Among HIV-positive adults aged 15 years and older, percentage with viral load suppression (VLS) by sex and age, MPHIA 2020-2021

Age	Men		Women		Total	
	Percentage with VLS[1]	Number	Percentage with VLS[1]	Number	Percentage with VLS[1]	Number
15-19	(79.4)	28	(74.5)	42	76.6	70
20-24	*	23	72.6	108	71.8	131
25-29	(73.9)	37	72.9	166	73.2	203
30-34	74.0	68	89.0	235	84.6	303
35-39	81.6	87	90.6	330	87.9	417
40-44	89.5	132	92.4	255	91.2	387
45-49	90.3	141	96.1	219	93.5	360
50-54	93.5	98	95.5	132	94.5	230
55-59	89.9	64	88.6	71	89.3	135
60-64	(82.0)	45	95.7	56	88.8	101
65+	(94.7)	45	90.8	79	92.3	124
15-24	75.0	51	73.2	150	73.8	201
25-34	74.0	105	82.6	401	80.1	506
35-44	86.1	219	91.4	585	89.6	804
45-54	91.7	239	95.9	351	93.9	590
55-64	87.0	109	91.6	127	89.1	236
Total 15-49	83.0	516	87.1	1,355	85.7	1,871
Total 50+	90.9	252	93.0	338	92.0	590
Total 15+	85.5	768	88.4	1,693	87.3	2,461

[1] Relates to Global AIDS Monitoring 2021 indicator 1.3: People living with HIV who have suppressed viral loads.
* Estimates based on a denominator less than 25 have been suppressed.
( ) Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

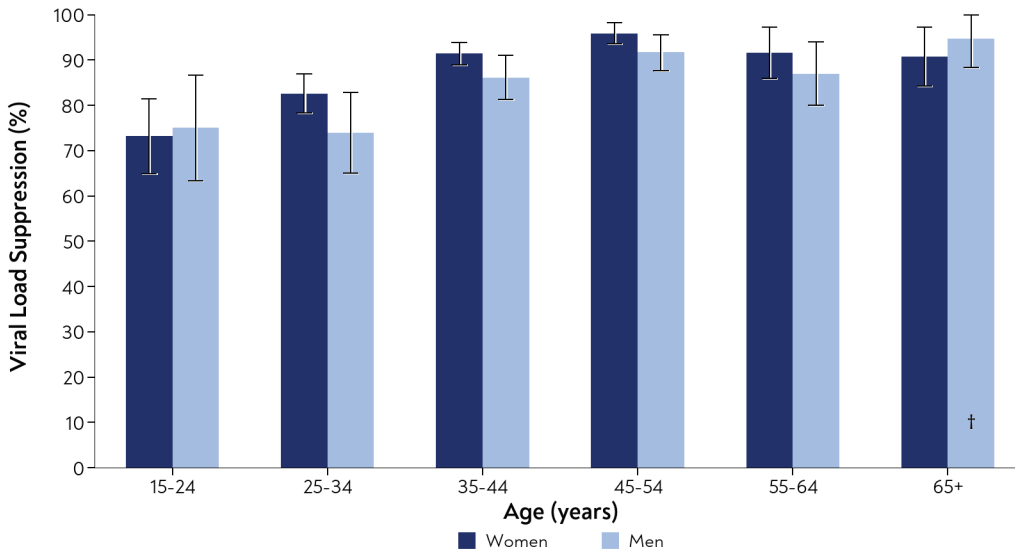


Figure 8.2
Viral load suppression among adults living with HIV by age and sex, MPHIA 2020-2021

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

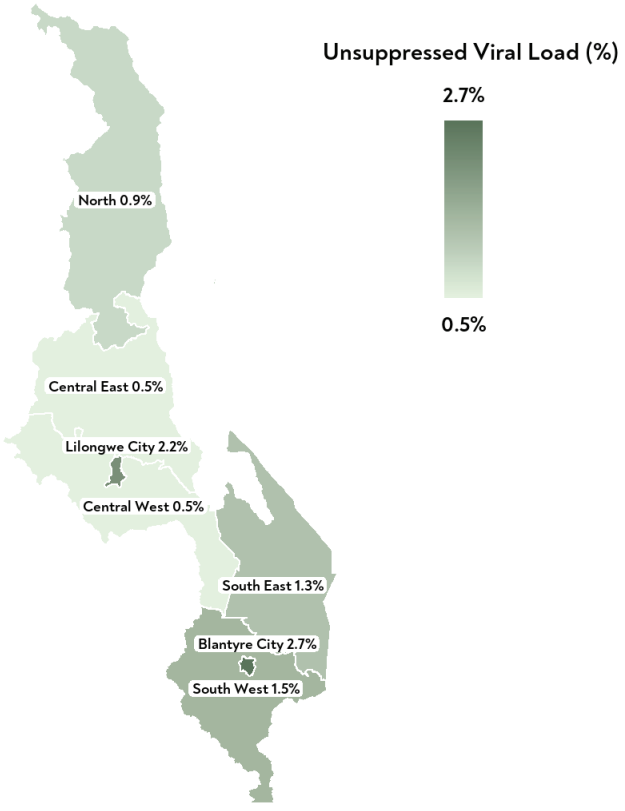
Table 8.3 Population viremia among the adult population in Malawi, by zone

Population viremia[1] (unsuppressed viral load [VL], defined as HIV RNA >= 1,000 copies/milliliter [mL]) among adults aged 15 years and older, by zone, MPHIA 2020-2021

	Percentage with VL ≥ 1000 copies/mL[1]	Number of adults tested for HIV	Mean log_{10} VL	Number of HIV-positive individuals with VL results
Zone				
North	0.9	2,564	1.6	183
Central East	0.5	3,851	1.6	171
Central West	0.5	3,105	1.5	168
Lilongwe City	2.2	1,236	1.9	153
South East	1.3	5,359	1.5	713
South West	1.5	5,247	1.5	859
Blantyre City	2.7	1,300	1.8	214
Total 15+	1.1	22,662	1.6	2,461

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

Figure 8.3
Population viremia (proportion of unsuppressed viral load in the adult population) by zone, MPHIA 2020-2021



Note: Population viremia is defined as unsuppressed viral load (HIV RNA ≥ 1,000 copies per milliliter) among all adults tested in MPHIA 2020-2021 (regardless of HIV status). The numerator is the number of people with unsuppressed viral loads, and the denominator is the entire population tested. Subnational areas with higher population viremia could be at risk of higher incidence.

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

Among HIV-positive adults aged 15 years and older, percentage with viral load (VL) < 200 copies per milliliter, by sex, self-reported diagnosis and antiretroviral therapy (ART) use (adjusted by antiretroviral [ARV] biomarker testing), and selected demographic characteristics, MPHIA 2020-2021

Characteristic	Men		Women		Total	
	Percentage with VL < 200 copies/mL	Number	Percentage with VL < 200 copies/mL	Number	Percentage with VL < 200 copies/mL	Number
HIV diagnosis and treatment status[1]						
Unaware of HIV status	29.1	106	18.3	147	23.6	253
Aware of HIV status and not on ART	*	14	(6.6)	27	(8.4)	41
Aware of HIV status and on ART	95.2	648	95.2	1,511	95.2	2,159
Number of years since initiating ART						
Less than 12 months	91.4	57	90.3	126	90.8	183
12 months or more	95.0	539	94.7	1,302	94.8	1,841
1 to less than 5 years	94.9	196	91.8	426	93.0	622
5 to less than 10 years	94.6	167	96.2	448	95.7	615
10 years or more	95.6	157	96.9	386	96.4	543
Residence						
Urban	75.3	185	79.8	371	77.9	556
Rural	86.3	583	88.1	1,314	87.5	1,897
Zone						
North	81.5	71	85.4	112	83.6	183
Central East	80.6	59	86.8	109	84.4	168
Central West	83.3	59	91.3	108	88.0	167
Lilongwe City	73.5	50	72.2	101	72.8	151
South East	87.0	199	87.0	513	87.0	712
South West	86.7	261	88.0	597	87.5	858
Blantyre City	76.5	69	81.5	145	79.5	214
Marital status						
Never married	63.8	53	69.3	84	66.8	137
Married or living together	86.0	624	86.2	894	86.1	1,518
Divorced or separated	76.0	64	85.3	391	83.7	455
Widowed	(84.4)	27	93.2	315	92.4	342
Education						
No education	82.2	68	92.8	258	90.0	326
Primary	86.1	482	87.1	1,092	86.7	1,574
Secondary	79.1	194	79.0	311	79.1	505
More than secondary	*	23		22	(70.1)	45
Wealth quintile						
Lowest	85.2	87	87.0	256	86.4	343
Second	84.8	110	88.1	265	87.0	375
Middle	84.9	160	88.0	367	86.8	527
Fourth	81.8	209	86.4	417	84.5	626
Highest	82.3	201	82.7	379	82.6	580

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

Among HIV-positive adults aged 15 years and older, percentage with viral load (VL) < 200 copies per milliliter, by sex, self-reported diagnosis and antiretroviral therapy (ART) use (adjusted by antiretroviral [ARV] biomarker testing), and selected demographic characteristics, MPHIA 2020-2021

Characteristic	Men		Women		Total	
	Percentage with VL < 200 copies/mL	Number	Percentage with VL < 200 copies/mL	Number	Percentage with VL < 200 copies/mL	Number
Age						
15-19	(71.3)	28	(70.1)	42	70.6	70
20-24	*	23	68.7	107	68.8	130
25-29	(68.9)	37	68.6	165	68.7	202
30-34	74.0	68	84.9	235	81.7	303
35-39	80.4	87	89.6	330	86.9	417
40-44	87.4	132	91.1	254	89.6	386
45-49	89.8	141	94.3	217	92.2	358
50-54	91.4	98	95.5	132	93.5	230
55-59	84.3	64	88.6	71	86.2	135
60-64	(80.1)	45	94.2	56	87.1	101
65+	(93.3)	45	90.4	76	91.5	121
Total 15-24	70.4	51	69.2	149	69.5	200
Total 15-49	81.3	516	84.6	1,350	83.4	1,866
Total 50+	88.1	252	92.7	335	90.5	587
Total 15+	83.4	768	86.3	1,685	85.2	2,453

[1] Both awareness of HIV-positive status and on treatment status were based upon self-report or having a detectable ARV in the blood.
* Estimates based on a denominator less than 25 have been suppressed.
( ) Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.
Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Table 8.5 Self-reported viral load testing

Percentage of HIV-positive adults aged 15 years and older who reported they had ever had a viral load (VL) test, and among those who had a VL test, percentage who reported that they received VL results from their last test, by selected demographic characteristics, MPHIA 2020-2021

Characteristic	Among all HIV-positive adults receiving HIV care		Among adults who had ever had a VL test	
	Percentage who had ever had a VL test	Number	Percentage who received VL results from their last test	Number
Sex				
Men	76.8	611	55.5	480
Women	78.3	1,463	53.1	1,156
Residence				
Urban	77.6	457	58.3	355
Rural	77.8	1,617	52.6	1,281
Zone				
North	73.8	150	62.2	111
Central East	80.3	132	59.2	106
Central West	66.7	138	56.6	94

Table 8.5 Self-reported viral load testing (continued)

Percentage of HIV-positive adults aged 15 years and older who reported they had ever had a viral load (VL) test, and among those who had a VL test, percentage who reported that they received VL results from their last test, by selected demographic characteristics, MPHIA 2020-2021

Characteristic	Among all HIV-positive adults receiving HIV care		Among adults who had ever had a VL test	
	Percentage who had ever had a VL test	Number	Percentage who received VL results from their last test	Number
Lilongwe City	67.0	129	60.6	88
South East	78.9	616	52.0	489
South West	81.8	736	50.6	604
Blantyre City	83.1	173	53.8	144
Marital status				
Never married	76.2	99	63.0	75
Married or living together	78.0	1,289	53.0	1,021
Divorced or separated	76.9	374	55.1	294
Widowed	78.6	312	53.7	246
Education				
No education	76.4	291	52.4	222
Primary	77.7	1,336	53.7	1,052
Secondary	79.0	412	55.9	334
More than secondary	(75.6)	32	(50.1)	25
Wealth quintile				
Lowest	77.2	281	54.9	224
Second	74.5	325	54.0	246
Middle	81.7	442	53.2	364
Fourth	77.4	540	50.5	422
Highest	77.2	484	58.1	378
Age				
15-19	(62.7)	47	(61.0)	29
20-24	69.1	90	49.3	62
25-29	70.5	146	48.9	103
30-34	79.3	243	53.3	195
35-39	77.5	357	54.4	285
40-44	76.6	346	57.5	272
45-49	83.5	321	53.7	271
50-54	80.9	212	52.2	173
55-59	84.7	121	57.2	103
60-64	75.7	86	46.3	66
65+	74.5	105	56.0	77
Total 15-24	66.5	137	53.7	91
Total 15-49	77.1	1,550	54.2	1,217
Total 50+	79.8	524	53.4	419
Total 15+	77.8	2,074	54.0	1,636

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

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9. UNAIDS 95-95-95 TARGETS

9.1 BACKGROUND

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

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

MPHIA 2020-2021 measured the 95-95-95 indicators using self-reported data adjusted with one of two types of biomarker data: either ARV biomarker data or having a viral load result below 200 copies/mL. For instance, in the ARV-adjusted estimates at the national and subnational levels, individuals were defined as "aware" of their HIV-positive status if they reported knowing they were HIV positive before testing as part of MPHIA 2020-2021 or if they had an ARV detectable in their blood. Individuals were categorized as "on treatment" if they reported ART use or if they had an ARV detectable in their blood. This chapter also presents 95-95-95 estimates at the national level using self-reported data adjusted for having a viral load below 200 copies/mL. Recent research suggests that a viral load measurement below 200 HIV RNA copies/mL may be a useful alternative to ARV-detection for determining awareness and treatment status since it has been believed that individuals are unlikely to have a viral load below 200 copies/mL if they are not on ART.[3]

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

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

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

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

9.2 RESULTS

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

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

95-95-95 targets among people living with HIV aged 15 years and older based upon their self-reported HIV status and antiretroviral (ART) use, both adjusted for a having a detectable antiretroviral (ARV) in blood, by sex and age, MPHIA 2020-2021

	Diagnosed					
	Men		Women		Total	
Age	Percentage aware of HIV status[1,2]	Number	Percentage aware of HIV status[1,2]	Number	Percentage aware of HIV status[1,2]	Number
15-24	77.2	51	75.8	150	76.2	201
25-34	69.5	105	85.6	401	81.0	506
35-49	88.8	360	94.9	804	92.6	1,164
50+	89.5	252	93.2	338	91.4	590
15-49	82.9	516	89.6	1,355	87.3	1,871
15+	85.0	768	90.4	1,693	88.3	2,461
	On Treatment					
	Men		Women		Total	
Age	Percentage on ART[1,3]	Number	Percentage on ART[1,3]	Number	Percentage on ART[1,3]	Number
15-24	73.6	51	72.9	150	73.1	201
25-34	66.1	105	83.0	401	78.1	506
35-49	86.9	360	93.7	804	91.1	1,164
50+	87.9	252	92.4	338	90.3	590
15-49	80.4	516	87.8	1,355	85.2	1,871
15+	82.8	768	88.7	1,693	86.5	2,461
	Viral Load Suppression (VLS) on Treatment					
	Men		Women		Total	
Age	Percentage with VLS[4]	Number	Percentage with VLS[4]	Number	Percentage with VLS[4]	Number
15-24	66.7	51	66.2	150	66.3	201
25-34	63.0	105	79.3	401	74.6	506
35-49	84.9	360	91.8	804	89.1	1,164
50+	85.4	252	91.0	338	88.3	590
15-49	77.7	516	84.7	1,355	82.3	1,871
15+	80.1	768	86.0	1,693	83.8	2,461

[1] Both awareness of HIV-positive status and on treatment status were based upon self-report or having a detectable ARV in the blood.
[2] Relates to Global AIDS Monitoring 2021 indicator (GAM 2021) 1.1: People living with HIV who know their HIV status; and PEPFAR indicator DIAGNOSED_NAT: Percentage of adults and children living with HIV who know their status (have been diagnosed).
[3] Relates to GAM 2021 1.2: People living with HIV on ART; and PEPFAR indicator TX_CURR_NAT / SUBNAT: Number of adults and children currently receiving ART.
[4] Relates to GAM 2021 1.3: People living with HIV who have suppressed viral loads; and PEPFAR indicator VL_SUPPRESSION_NAT: Percentage of people living with HIV on ART with a suppressed viral load.

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

95-95-95 targets among people living with HIV aged 15 years and older based upon their self-reported HIV status and antiretroviral (ART) use, both adjusted for having a detectable antiretroviral (ART) in blood, by sex and age, MPHIA 2020-2021

	Diagnosed					
	Men		Women		Total	
Age	Percentage aware of HIV status[1,2]	Number	Percentage aware of HIV status[1,2]	Number	Percentage aware of HIV status[1,2]	Number
15-24	77.2	51	75.8	150	76.2	201
25-34	69.5	105	85.6	401	81.0	506
35-49	88.8	360	94.9	804	92.6	1,164
50+	89.5	252	93.2	338	91.4	590
15-49	82.9	516	89.6	1,355	87.3	1,871
15+	85.0	768	90.4	1,693	88.3	2,461
	On Treatment Among Those Diagnosed					
	Men		Women		Total	
Age	Percentage on ART[1,3]	Number	Percentage on ART[1,3]	Number	Percentage on ART[1,3]	Number
15-24	(95.4)	38	96.2	115	95.9	153
25-34	95.1	73	96.9	347	96.5	420
35-49	97.8	322	98.7	766	98.4	1,088
50+	98.2	229	99.2	318	98.7	547
15-49	97.0	433	97.9	1,228	97.6	1,661
15+	97.4	662	98.2	1,546	97.9	2,208
	Viral Load Suppression (VLS) Among Those on Treatment					
	Men		Women		Total	
Age	Percentage with VLS[4]	Number	Percentage with VLS[4]	Number	Percentage with VLS[4]	Number
15-24	(90.6)	36	90.7	111	90.7	147
25-34	95.4	70	95.6	336	95.5	406
35-49	97.7	317	98.0	757	97.9	1,074
50+	97.1	225	98.4	315	97.8	540
15-49	96.6	423	96.5	1,204	96.5	1,627
15+	96.8	648	96.9	1,519	96.9	2,167

[1] Both awareness of HIV-positive status and on treatment status were based upon self-report or having a detectable ARV in the blood.
[2] Relates to Global AIDS Monitoring 2021 indicator (GAM 2021) 1.1: People living with HIV who know their HIV status; and PEPFAR indicator DIAGNOSED_NAT: Percentage of adults and children living with HIV who know their status (have been diagnosed).
[3] Relates to GAM 2021 1.2: People living with HIV on ART; and PEPFAR indicator TX_CURR_NAT / SUBNAT: Number of adults and children currently receiving ART.
[4] Relates to GAM 2021 1.3: People living with HIV who have suppressed viral loads; and PEPFAR indicator VL_SUPPRESSION_NAT: Percentage of people living with HIV on ART with a suppressed viral load.
( ) Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

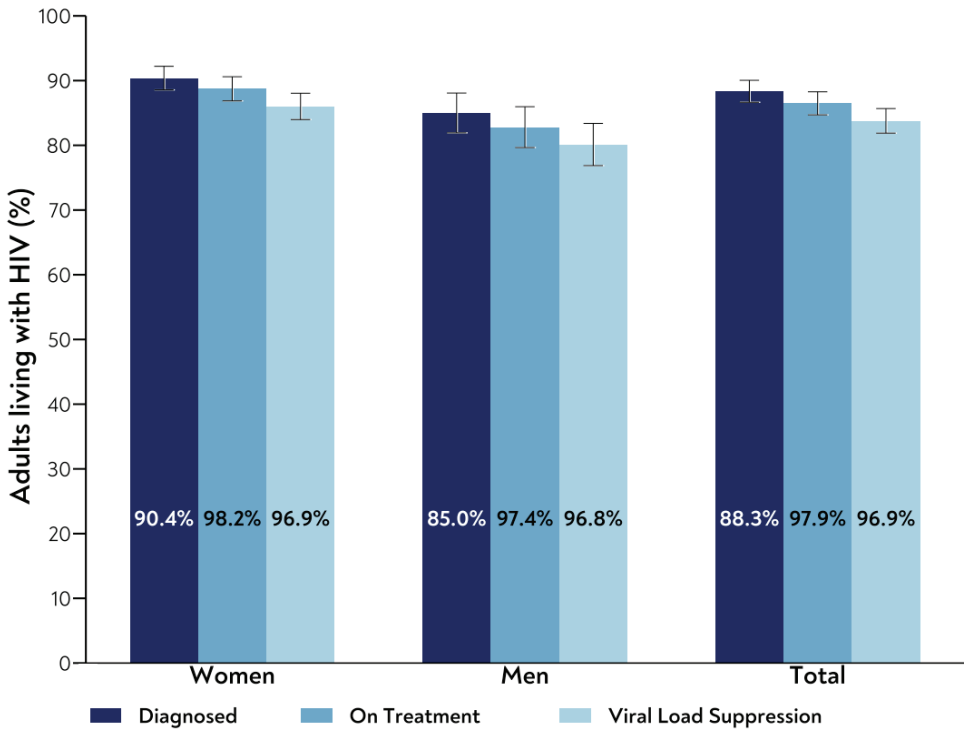


Figure 9.1
ARV-adjusted 95-95-95 among adults (ages 15 years and older) living with HIV, by sex, MPHIA 2020-2021

Note: In the antiretroviral (ARV)-adjusted 95-95-95, participants are classified as "aware" or "diagnosed" if they reported knowing their HIV-positive status before testing positive in MPHIA 2020-2021 or had a detectable antiretrovirals (ARVs) in their blood. Participants are classified as "on treatment" if they reported that they were on treatment or if they had detectable ARVs in their blood. Inset numbers are conditional proportions; the heights of the bars represent the unconditional proportions among all adults living with HIV.

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

95-95-95 targets among adults living with HIV aged 15 years and older, based upon their self-reported HIV status and antiretroviral therapy (ART) use, both adjusted for having a viral load (VL) < 200 copies per milliliter (mL), by sex and age, MPHIA 2020-2021

	Diagnosed					
	Men		Women		Total	
Age	Percentage aware of HIV status[1,2]	Number	Percentage aware of HIV status[1,2]	Number	Percentage aware of HIV status[1,2]	Number
15-24	83.8	51	82.2	150	82.7	201
25-34	80.5	105	87.5	401	85.5	506
35-49	89.9	360	95.6	804	93.4	1,164
50+	92.9	252	95.0	338	94.0	590
15-49	87.0	516	91.4	1,355	89.9	1,871
15+	88.9	768	92.1	1,693	90.9	2,461

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

95-95-95 targets among adults living with HIV aged 15 years and older, based upon their self-reported HIV status and antiretroviral therapy (ART) use, both adjusted for having a viral load (VL) < 200 copies per milliliter (mL), by sex and age, MPHIA 2020-2021

	On Treatment					
	Men		Women		Total	
Age	Percentage on ART[1,3]	Number	Percentage on ART[1,3]	Number	Percentage on ART[1,3]	Number
15-24	80.2	51	80.0	150	80.0	201
25-34	77.0	105	85.1	401	82.7	506
35-49	88.5	360	94.2	804	92.0	1,164
50+	91.3	252	94.0	338	92.7	590
15-49	84.9	516	89.6	1,355	87.9	1,871
15+	86.9	768	90.5	1,693	89.1	2,461
	Viral Load Suppression (VLS) on Treatment					
	Men		Women		Total	
Age	Percentage with VLS[4]	Number	Percentage with VLS[4]	Number	Percentage with VLS[4]	Number
15-24	75.0	51	73.2	150	73.8	201
25-34	74.0	105	81.4	401	79.2	506
35-49	86.9	360	92.4	804	90.3	1,164
50+	89.0	252	92.8	338	91.0	590
15-49	82.6	516	86.6	1,355	85.2	1,871
15+	84.6	768	87.9	1,693	86.6	2,461

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

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

95-95-95 targets among adults living with HIV aged 15 years and older, based upon their self-reported HIV status and antiretroviral therapy (ART) use, both adjusted for having a viral load (VL) < 200 copies per milliliter (mL), by sex and age, MPHIA 2020-2021

	Diagnosed					
	Men		Women		Total	
Age	Percentage aware of HIV status[1,2]	Number	Percentage aware of HIV status[1,2]	Number	Percentage aware of HIV status[1,2]	Number
15-24	83.8	51	82.2	150	82.7	201
25-34	80.5	105	87.5	401	85.5	506
35-49	89.9	360	95.6	804	93.4	1,164
50+	92.9	252	95	338	94	590
15-49	87	516	91.4	1,355	89.9	1,871
15+	88.9	768	92.1	1,693	90.9	2,461

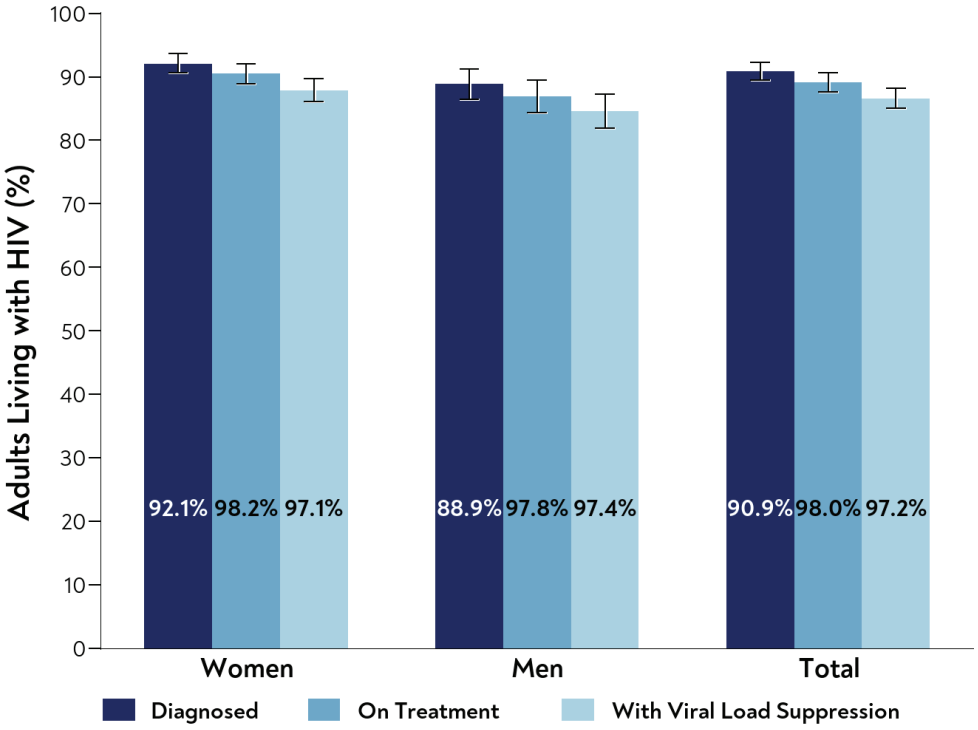
Table 9.2.B Adult 95-95-95 (self-reported data adjusted for a viral load < 200 HIV RNA copies per milliliter); conditional percentages (continued)

95-95-95 targets among adults living with HIV aged 15 years and older, based upon their self-reported HIV status and antiretroviral therapy (ART) use, both adjusted for having a viral load (VL) < 200 copies per milliliter (mL), by sex and age, MPHIA 2020-2021

	On Treatment Among Those Diagnosed					
	Men		Women		Total	
Age	Percentage on ART[1,3]	Number	Percentage on ART[1,3]	Number	Percentage on ART[1,3]	Number
15-24	(95.7)	42	97.3	123	96.8	165
25-34	95.7	83	97.2	353	96.8	436
35-49	98.4	326	98.5	771	98.5	1,097
50+	98.2	235	98.9	323	98.6	558
15-49	97.6	451	98	1,247	97.8	1,698
15+	97.8	686	98.2	1,570	98	2,256
	Viral Load Suppression (VLS) Among Those on Treatment					
	Men		Women		Total	
Age	Percentage with VLS[4]	Number	Percentage with VLS[4]	Number	Percentage with VLS[4]	Number
15-24	(93.5)	40	91.5	120	92.1	160
25-34	96	80	95.7	343	95.8	423
35-49	98.2	322	98.1	761	98.2	1,083
50+	97.5	231	98.7	319	98.2	550
15-49	97.3	442	96.7	1,224	96.9	1,666
15+	97.4	673	97.1	1,543	97.2	2,216

[1] Both awareness of HIV-positive status and on treatment status were based upon self-report or having a VL < 200 copies/mL.
[2] Relates to Global AIDS Monitoring 2021 indicator (GAM 2021) 1.1: People living with HIV who know their HIV status;and PEPFAR indicator DIAGNOSED_NAT: The percentage of adults and children living with HIV who know their status (have been diagnosed).
[3] Relates to GAM 2021 1.2: People living with HIV on ART and PEPFAR indicator TX_CURR_NAT / SUBNAT: Percentage of adults and children receiving ART.
[4] Relates to GAM 2021 1.3: People living with HIV who have suppressed viral loads and PEPFAR indicator VL_SUPPRESSION_NAT: Percentage of people living with HIV on ART with a suppressed viral load.
( ) Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

Figure 9.2
Viral load-adjusted 95-95-95 among adults (ages 15 years and older) living with HIV, by sex, MPHIA 2020-2021



Note: In the viral load-adjusted 95-95-95, participants are classified as "aware" or "diagnosed" if they reported knowing their HIV-positive status before testing positive in MPHIA 2020-2021 or had a viral load < 200 copies/mL. Participants are classified as "on treatment" if they reported that they were on treatment or if they had a viral load < 200 copies/mL. Inset numbers are conditional proportions; the heights of the bars represent the unconditional proportions among all adults living with HIV.

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

95-95-95 targets among people living with HIV aged 15 years and older based upon their self-reported HIV status and antiretroviral therapy (ART) use, both adjusted for having a detectable antiretroviral (ARV) in blood, by sex, residence, and zone, MPHIA 2020-2021

	Diagnosed					
	Men		Women		Total	
	Percentage aware of HIV status[1,2]	Number	Percentage aware of HIV status[1,2]	Number	Percentage aware of HIV status[1,2]	Number
Residence						
Urban	83.6	185	89.3	373	86.9	558
Rural	85.5	583	90.7	1,320	88.8	1,903
Zone						
North	82.7	71	90.4	112	86.9	183
Central East	79.2	59	85.5	112	83.0	171
Central West	74.9	59	93.2	109	85.7	168
Lilongwe City	83.7	50	85.0	103	84.5	153
South East	90.2	199	91.6	514	91.1	713
South West	88.3	261	90.8	598	89.9	859
Blantyre City	83.1	69	89.6	145	87.0	214

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

95-95-95 targets among people living with HIV aged 15 years and older based upon their self-reported HIV status and antiretroviral therapy (ART) use, both adjusted for having a detectable antiretroviral (ARV) in blood, by sex, residence, and zone, MPHIA 2020-2021

	On Treatment					
	Men		Women		Total	
	Percentage on ART[1,3]	Number	Percentage on ART[1,3]	Number	Percentage on ART[1,3]	Number
Residence						
Urban	80.3	185	86.8	373	84.1	558
Rural	83.7	583	89.3	1,320	87.2	1,903
Zone						
North	80.3	71	87.0	112	83.9	183
Central East	79.2	59	85.5	112	83.0	171
Central West	68.3	59	89.6	109	80.9	168
Lilongwe City	81.7	50	80.0	103	80.7	153
South East	89.0	199	90.7	514	90.1	713
South West	87.0	261	89.7	598	88.7	859
Blantyre City	79.4	69	88.0	145	84.7	214
	Viral Load Suppression (VLS) on Treatment					
	Men		Women		Total	
	Percentage with VLS[4]	Number	Percentage with VLS[4]	Number	Percentage with VLS[4]	Number
Residence						
Urban	77.2	185	81.8	373	79.9	558
Rural	81.2	583	87.3	1,320	85.0	1,903
Zone						
North	75.4	71	85.1	112	80.7	183
Central East	79.2	59	81.9	112	80.9	171
Central West	66.9	59	87.9	109	79.3	168
Lilongwe City	80.0	50	74.5	103	76.9	153
South East	85.2	199	87.7	514	86.8	713
South West	84.6	261	87.9	598	86.7	859
Blantyre City	76.5	69	84.0	145	81.0	214

[1] Both awareness of HIV-positive status and on treatment status were based upon self-report or having a detectable ARV in the blood.
[2] Relates to Global AIDS Monitoring 2021 indicator (GAM 2021) 1.1: People living with HIV who know their HIV status; and PEPFAR indicator DIAGNOSED_NAT: Percentage of adults and children living with HIV who know their status (have been diagnosed).
[3] Relates to GAM 2021 1.2: People living with HIV on ART and PEPFAR indicator TX_CURR_NAT / SUBNAT: Number of adults and children currently receiving ART.
[4] Relates to GAM 2021 1.3: People living with HIV who have suppressed viral loads; and PEPFAR indicator VL_SUPPRESSION_NAT: Percentage of people living with HIV on ART with a suppressed viral load.

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

95-95-95 targets among people living with HIV aged 15 years and older based upon their self-reported HIV status and antiretroviral (ART) use, both adjusted for a having a detectable antiretroviral (ARV) in blood, by sex, residence, and zone, MPHIA 2020-2021

	Diagnosed					
	Men		Women		Total	
	Percentage aware of HIV status[1,2]	Number	Percentage aware of HIV status[1,2]	Number	Percentage aware of HIV status[1,2]	Number
Residence						
Urban	83.6	185	89.3	373	86.9	558
Rural	85.5	583	90.7	1,320	88.8	1,903
Zone						
North	82.7	71	90.4	112	86.9	183
Central East	79.2	59	85.5	112	83.0	171
Central West	74.9	59	93.2	109	85.7	168
Lilongwe City	83.7	50	85.0	103	84.5	153
South East	90.2	199	91.6	514	91.1	713
South West	88.3	261	90.8	598	89.9	859
Blantyre City	83.1	69	89.6	145	87.0	214
	On Treatment Among Those Diagnosed[1]					
	Men		Women		Total	
	Percentage on ART[1,3]	Number	Percentage on ART[1,3]	Number	Percentage on ART[1,3]	Number
Residence						
Urban	96.1	155	97.1	337	96.7	492
Rural	97.9	507	98.5	1,209	98.3	1,716
Zone						
North	97.0	59	96.3	102	96.6	161
Central East	(100.0)	47	100.0	97	100.0	144
Central West	(91.3)	45	96.2	103	94.4	148
Lilongwe City	(97.5)	42	94.1	90	95.6	132
South East	98.7	180	99.1	474	99.0	654
South West	98.5	231	98.8	549	98.7	780
Blantyre City	95.6	58	98.3	131	97.3	189
	Viral Load Suppression (VLS) Among Those on Treatment					
	Men		Women		Total	
	Percentage with VLS[4]	Number	Percentage with VLS[4]	Number	Percentage with VLS[4]	Number
Residence						
Urban	96.1	149	94.2	328	95.0	477
Rural	97.0	499	97.7	1,191	97.5	1,690
Zone						
North	94.0	57	97.8	98	96.1	155
Central East	(100.0)	47	95.8	97	97.4	144
Central West	(97.9)	41	98.1	99	98.0	140
Lilongwe City	(98.0)	41	93.0	85	95.2	126

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

95-95-95 targets among people living with HIV aged 15 years and older based upon their self-reported HIV status and antiretroviral (ART) use, both adjusted for a having a detectable antiretroviral (ARV) in blood, by sex, residence, and zone, MPHIA 2020-2021

	Viral Load Suppression (VLS) Among Those on Treatment					
	Men		Women		Total	
	Percentage with VLS[4]	Number	Percentage with VLS[4]	Number	Percentage with VLS[4]	Number
South East	95.7	178	96.6	469	96.3	647
South West	97.2	228	97.9	542	97.7	770
Blantyre City	96.3	56	95.4	129	95.7	185

[1] Both awareness of HIV-positive status and on treatment status were based upon self-report or having a detectable ARV in the blood.
[2] Relates to Global AIDS Monitoring 2021 indicator (GAM 2021) 1.1: People living with HIV who know their HIV status; and PEPFAR indicator DIAGNOSED_NAT: Percentage of adults and children living with HIV who know their status (have been diagnosed).
[3] Relates to GAM 2021 1.2: People living with HIV on ART and PEPFAR indicator TX_CURR_NAT / SUBNAT: Number of adults and children currently receiving ART.
[4] Relates to GAM 2021 1.3: People living with HIV who have suppressed viral loads; and PEPFAR indicator VL_SUPPRESSION_NAT: Percentage of people living with HIV on ART with a suppressed viral load.
( ) Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

9.3 REFERENCES

1. Joint United Nations Programme on HIV/AIDS (UNAIDS). *90-90-90: An ambitious treatment target to help end the AIDS epidemic.* Geneva: UNAIDS; 2014. https://www.unaids.org/sites/default/files/media_asset/90-90-90_en.pdf. Accessed February 2, 2021.

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3. Young PW, Zielinski-Gutierrez E, Wamicwe J, et al. Use of viral load to improve survey estimates of known HIV-positive status and antiretroviral treatment coverage. *AIDS*. 2020;34(4):631-636. doi:10.1097/QAD.0000000000002453.

10. CLINICAL PERSPECTIVES ON PEOPLE LIVING WITH HIV

10.1 BACKGROUND

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

MPHIA 2020-2021 provided a unique opportunity to gauge progress in the expansion of HIV clinical services in Malawi, as well as identify gaps and future challenges. Indicators such as CD4 count at diagnosis and retention on ART can provide evidence of program coverage, the ability to reach vulnerable populations, and quality of care. The distribution of CD4 counts also reflects population health and the potential impact of HIV on mortality. For instance, a CD4 count below 350/μL is categorized as immune suppression, and a CD4 count of less than 200/μL is categorized as advanced HIV disease that requires more intensive care, treatment, and support services to manage. When HIV is diagnosed in someone with immune suppression or advanced HIV disease, it is also considered a late diagnosis. Tracking the proportion of diagnoses made late can serve as an indicator of whether there are barriers to testing and can help programs allocate resources for the care of people living with advanced HIV disease.

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

10.2 RESULTS

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

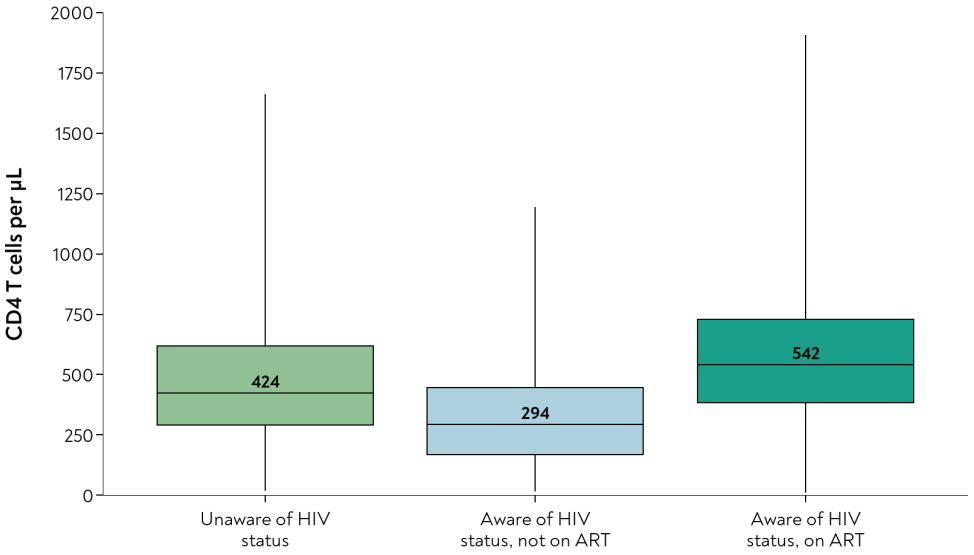
Table 10.1 Median CD4 count by HIV diagnosis and antiretroviral therapy status

Among HIV-positive adults aged 15 years and older, median (quartile 1 [Q1], quartile 3 [Q3]) CD4 count (cells per microliter), by sex, and HIV diagnosis and treatment status based upon self-reported HIV-status and current antiretroviral therapy (ART) use, both adjusted for having a detectable antiretroviral (ARV) in blood, MPHIA 2020-2021

Characteristic	Men			Women			Total		
	Median (Q1, Q3)	Range	Number	Number	Median (Q1, Q3)	Number	Median (Q1, Q3)	Range	Number
HIV diagnosis and treatment status[1]									
Unaware of HIV status	416 (275, 573)	19-1175	106	421 (296, 651)	31-1662	146	424 (290, 619)	19-1662	252
Aware of HIV status and not on ART	247 (205, 398)	54-735	14	381 (97, 451)†	17-1193†	27	294 (169, 447)†	17-1193†	41
Aware of HIV status and on ART	437 (314, 597)	39-1620	648	619 (448, 791)	7-1906	1,518	542 (383, 728)	7-1906	2,166
Total 15-24	554 (408, 726)	60-1303	51	654 (449, 876)	65-1408	150	620 (434, 812)	60-1408	201
Total 15-49	440 (312, 615)	19-1620	516	596 (415, 789)	17-1900	1,356	536 (372, 726)	17-1900	1,872
Total 50+	416 (290, 551)	54-1175	252	596 (448, 766)	7-1906	338	492 (346, 674)	7-1906	590
Total 15+	430 (305, 594)	19-1620	768	596 (420, 783)	7-1906	1,694	524 (367, 715)	7-1906	2,462

[1] Both awareness of HIV-positive status and on treatment status were based upon self-report or having a detectable ARV in the blood.
† Estimates based on a denominator of 25-49 should be interpreted with caution.

Figure 10.1
CD4 count distribution among adults (ages 15 years and older) living with HIV, by HIV diagnosis and ART status, MPHIA 2020-2021



This box plot shows the CD4 count distribution among those who tested positive in the survey, based upon their self-reported awareness of HIV-positive status and antiretroviral therapy (ART) use. The band and number within each box represent the median CD4 count; the box represents the interquartile range (where half of the CD4 count measurements lie); while the whiskers (vertical lines) above and below the box show the range from the minimum to the maximum CD4 count.

Table 10.2 CD4 count distribution

Percent distribution of CD4 count among adults aged 15 years and older who tested HIV positive in the survey but reported an HIV-negative status and had no antiretroviral detectable in blood, by sex and selected demographic characteristics, MPHIA 2020-2021

Characteristic	CD4 Count				Number
	< 200 cells/µL[1]	200-349 cells/µL	350-499 cells/µL	>= 500 cells/µL	
Sex					
Men	13.0	26.7	25.4	34.9	106
Women	10.4	24.8	20.5	44.3	147
Residence					
Urban	14.2	28.5	37.3	19.9	66
Rural	10.7	24.7	17.6	47.0	187
Zone					
North	*	*	*	*	22
Central East	(3.9)	(20.6)	(35.5)	(39.9)	27
Central West	*	*	*	*	20
Lilongwe City	*	*	*	*	21
South East	8.2	27.3	18.0	46.5	59
South West	16.4	24.7	20.5	38.5	79
Blantyre City	(9.3)	(40.0)	(25.3)	(25.4)	25

Table 10.2 CD4 count distribution (continued)

Percent distribution of CD4 count among adults aged 15 years and older who tested HIV positive in the survey but reported an HIV-negative status and had no antiretroviral detectable in blood, by sex and selected demographic characteristics, MPHIA 2020-2021

Characteristic	CD4 Count				Number
	< 200 cells/μL[1]	200-349 cells/μL	350-499 cells/μL	>= 500 cells/μL	
Age					
15-24	(5.1)	(18.6)	(26.0)	(50.3)	48
25-34	6.3	25.1	21.2	47.5	86
35-44	24.2	28.7	21.4	25.7	56
45-54	(18.7)	(29.8)	(29.1)	(22.4)	31
55-64	*	*	*	*	20
65+	*	*	*	*	12
Total 15-24	(5.1)	(18.6)	(26.0)	(50.3)	48
Total 15-49	12.4	25.5	23.1	39.1	210
Total 50+	(8.5)	(26.9)	(22.1)	(42.5)	43
Total 15+	11.7	25.7	22.9	39.7	253

[1] Relates to Global AIDS Monitoring 2021 indicator 1.4: Late HIV Diagnosis.
* Estimates based on a denominator less than 25 have been suppressed.
( ) Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

Table 10.3 Retention on antiretroviral therapy

Among HIV-positive adults aged 15 years and older who reported initiating antiretroviral therapy (ART), percentage who reported they were still taking ART, by sex and years since initiating ART, MPHIA 2020-2021

Charasteristic	Men		Women		Total	
	Percentage still taking ART	Number	Percentage still taking ART	Number	Percentage still taking ART	Number
Number of years since initiating ART						
Less than 12 months	100.0	57	98.7	128	99.2	185
12 months or more	98.1	539	98.9	1,311	98.6	1,850
1 to less than 5 years	98.4	196	97.6	431	97.9	627
5 to less than 10 years	97.8	167	99.5	450	98.9	617
10 years or more	97.9	157	99.5	388	99.0	545
Total 15-24	(94.5)	32	96.9	109	96.2	141
Total 15-49	98.1	406	98.7	1,190	98.5	1,596
Total 50+	98.1	222	99.3	310	98.8	532
Total 15+	98.1	628	98.8	1,500	98.6	2,128

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

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

Among HIV-positive adults aged 15 years and older, percent distribution of HIV care and antiretroviral therapy (ART) status and receipt characteristics, by extended stay away from home, based upon self-report, MPHIA 2020-2021

Characteristic	Lived away from home for more than 1 month at a time in the year before the survey			
	Yes	Number	No	Number
HIV diagnosis and treatment status[1]				
Unaware of HIV status	17.3	36	10.6	163
Aware of HIV status and not on ART	2.4	5	1.9	30
Aware of HIV status and on ART	80.3	198	87.6	1,572
Viral load suppression (VLS)				
Yes	83.7	204	88.0	1,564
No	16.3	35	12.0	201
Treatment interrupted				
Yes	12.6	24	NA	NA
No	86.6	170	NA	NA
Never on ART	0.8	1	NA	NA
Was ART changed				
Yes	63.8	126	67.8	1,033
No	35.4	67	31.3	486
Never on ART	0.8	1	0.9	14
How normally receive ART				
Pick up at local clinic	60.9	124	65.2	1,026
Pick up at hospital	36.9	70	32.7	488
From the community support group/ adherence club	0.0	0	0.4	5
Delivery	0.0	0	0.1	2
A family member or friend collects them	0.0	0	0.2	4
Not currently on ART	2.2	4	1.4	18
Total 15+	100.0	240	100.0	1,767

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

Table 10.5 Mental health and HIV care and treatment

Percent distribution of care and treatment outcomes among HIV positive adults by mental health screening symptoms, MPHIA 2020-2021

	Screened likely for depressive symptoms[2]		Did not screen likely for depressive symptoms		Screened likely for generalized anxiety symptoms[3]		Did not screen likely for generalized anxiety symptoms	
Characteristic	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number
HIV diagnosis and treatment status[1]								
Unaware of HIV status	4.6	2	11.8	250	13.0	5	11.6	247
Aware of HIV status and not on antiretroviral therapy (ART)	0.0	0	1.9	41	0.0	0	1.9	41
Aware of HIV status and on ART	95.4	49	86.3	2,107	87.0	54	86.5	2,107

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

Percent distribution of care and treatment outcomes among HIV positive adults by mental health screening symptoms, MPHIA 2020-2021

	Screened likely for depressive symptoms[2]		Did not screen likely for depressive symptoms		Screened likely for generalized anxiety symptoms[3]		Did not screen likely for generalized anxiety symptoms	
Characteristic	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number
Presence of a detectable antiretroviral (ARV)								
Detectable	89.3	46	83.0	2,023	79.0	49	83.2	2,025
Not detectable	10.7	5	17.0	375	21.0	10	16.8	370
Viral load suppression (VLS)								
Yes	89.3	46	87.2	2,110	87.3	53	87.3	2,108
No	10.7	5	12.8	288	12.7	6	12.7	287
Ever on ART								
Yes	100.0	48	98.9	2,069	100.0	54	98.9	2,068
No	0.0	0	1.1	21	0.0	0	1.1	21
Retention (among those who reported ever initiating ART)								
Reported current ART use	100.0	48	98.6	2,043	100.0	54	98.5	2,041
Reported initiating but not on ART at time of the survey	0.0	0	1.4	26	0.0	0	1.5	27
Adherence (among those who reported current ART use)								
Adherent	70.8	34	83.6	1,698	69.9	37	83.8	1,699
Non-adherent	29.2	14	16.4	337	30.1	17	16.2	333
Total 15+	100.0	51	100.0	2,401	100.0	59	100.0	2,398

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

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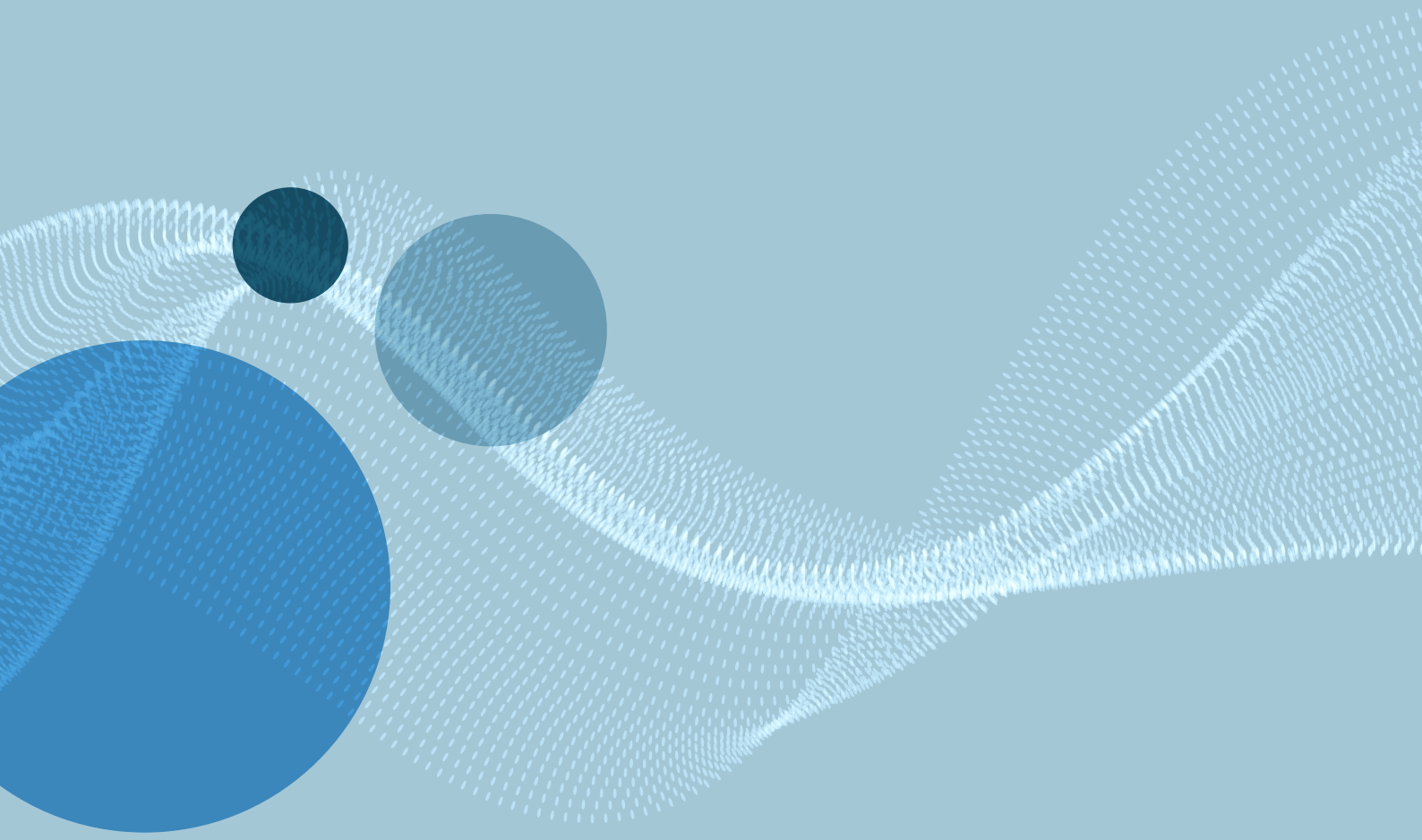

11. PREVENTION OF MOTHER-TO-CHILD TRANSMISSION

11.1 BACKGROUND

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

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

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

11.2 RESULTS

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

Table 11.1 Antenatal care

Among women aged 15-49 years who delivered in the 3 years before the survey, percentage who reported attending at least one antenatal care (ANC) visit for her most recent birth, by selected demographic characteristics, MPHIA 2020-2021

Characteristic	Percentage who attended at least one ANC visit	Number
Residence		
Urban	98.8	758
Rural	98.6	3,827
Zone		
North	98.2	453
Central East	98.9	714
Central West	99.1	644
Lilongwe City	99.1	262
South East	98.4	1,325
South West	98.3	965
Blantyre City	99.2	222
Marital status		
Never married	98.4	235
Married or living together	98.8	3,641
Divorced or separated	98.3	656
Widowed	(96.1)	49

Table 11.1 Antenatal care (continued)

Among women aged 15-49 years who delivered in the 3 years before the survey, percentage who reported attending at least one antenatal care (ANC) visit for her most recent birth, by selected demographic characteristics, MPHIA 2020-2021

Characteristic	Percentage who attended at least one ANC visit	Number
Education		
No education	98.7	380
Primary	98.7	3,141
Secondary	98.5	979
More than secondary	100.0	81
Wealth quintile		
Lowest	98.7	1,064
Second	99.0	1,009
Middle	98.4	883
Fourth	98.4	843
Highest	98.7	786
Age		
15-19	97.4	462
20-24	98.8	1,560
25-29	98.8	1,103
30-34	98.9	692
35-39	98.8	537
40-44	100.0	173
45-49	96.6	58
Total 15-24	98.4	2,022
Total 15-49	98.7	4,585

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

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

Among women aged 15-49 years who gave birth within the 12 months before the survey, percentage who reported that they were tested for HIV during antenatal care (ANC) and received their results or that they already knew they were HIV positive during their last pregnancy, by selected demographic characteristics, MPHIA 2020-2021

Characteristic	Tested for HIV during ANC and received results		Percentage who already knew they were HIV positive	Total percentage with known HIV status[1]	Number of women who gave birth within the 12 months before the survey
	Percentage who tested HIV positive	Percentage who tested HIV negative			
Residence					
Urban	1.8	87.4	6.2	95.4	310
Rural	1.3	88.0	4.0	93.4	1,513
Region					
North	0.0	90.7	1.5	92.2	203
Central East	0.3	92.8	1.7	94.8	292

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

Among women aged 15-49 years who gave birth within the 12 months before the survey, percentage who reported that they were tested for HIV during antenatal care (ANC) and received their results or that they already knew they were HIV positive during their last pregnancy, by selected demographic characteristics, MPHIA 2020-2021

Characteristic	Tested for HIV during ANC and received results		Percentage who already knew they were HIV positive	Total percentage with known HIV status[1]	Number of women who gave birth within the 12 months before the survey
	Percentage who tested HIV positive	Percentage who tested HIV negative			
Central West	0.7	92.4	0.4	93.4	256
Lilongwe City	1.7	89.5	2.5	93.7	104
South East	2.5	83.1	7.3	92.9	494
South West	2.1	83.6	8.7	94.5	381
Blantyre City	4.3	81.2	10.9	96.4	93
Marital status					
Never married	0.9	86.7	2.6	90.3	103
Married or living together	1.3	89.3	3.6	94.3	1,472
Divorced or separated	2.2	82.4	7.6	92.1	231
Widowed	*	*	*	*	15
Education					
No education	0.6	88.9	5.1	94.6	160
Primary	1.4	87.7	4.5	93.6	1,249
Secondary	2.0	87.8	3.6	93.3	379
More than secondary	(0.0)	(94.1)	(3.0)	(97.1)	35
Wealth quintile					
Lowest	1.2	89.4	4.0	94.6	396
Second	1.3	88.7	3.1	93.0	400
Middle	0.9	88.6	5.2	94.7	354
Fourth	2.1	86.1	3.8	91.9	350
Highest	1.8	86.4	6.1	94.3	323
Age					
15-19	1.7	90.5	0.4	92.7	254
20-24	0.9	90.7	2.7	94.4	619
25-29	1.3	90.4	4.2	96.0	412
30-34	2.0	83.2	6.8	92.0	258
35-39	1.3	79.6	11.3	92.3	204
40-44	3.0	77.3	8.3	88.6	63
45-49	*	*	*	*	13
Total 15-24	1.2	90.7	1.9	93.8	873
Total 15-49	1.4	87.9	4.3	93.7	1,823

[1] Relates to PEPFAR indicator PMTCT_STAT_NAT / SUBNAT: Percentage of pregnant women with known HIV status and Global AIDS Monitoring 2021 indicator 2.6: HIV testing in pregnant women.
( ) Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.
* Estimates based on a denominator less than 25 have been suppressed.
Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

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

Among self-reported HIV-positive women aged 15-49 years who gave birth within the 12 months before the survey, percentage who reported they had received antiretroviral therapy (ART) during their last pregnancy to reduce the risk of mother-to-child-transmission, by selected demographic characteristics, MPHIA 2020-2021

Characteristic	Percentage who were already on ART prior to pregnancy	Percentage who were newly initiated on ART during pregnancy or labor and delivery	Total percentage who received ART[1]	Number of HIV-positive women who gave birth within the 12 months before the survey
Residence				
Urban	(70.3)	(29.7)	(100.0)	26
Rural	69.7	29.1	98.8	96
Zone				
North	*	*	*	3
Central East	*	*	*	6
Central West	*	*	*	3
Lilongwe City	*	*	*	5
South East	(69.5)	(30.5)	(100.0)	47
South West	(80.5)	(19.5)	(100.0)	44
Blantyre City	*	*	*	14
Marital status				
Never married	*	*	*	4
Married or living together	68.2	30.4	98.6	82
Divorced or separated	(73.3)	(26.7)	(100.0)	28
Widowed	*	*	*	8
Education				
No education	*	*	*	11
Primary	69.7	28.9	98.6	87
Secondary	*	*	*	23
More than secondary	*	*	*	1
Wealth quintile				
Lowest	*	*	*	24
Second	*	*	*	21
Middle	(79.8)	(20.2)	(100.0)	25
Fourth	*	*	*	23
Highest	(74.1)	(25.9)	(100.0)	29
Age				
15-19	*	*	*	6
20-24	(62.0)	(33.3)	(95.4)	26
25-29	(75.9)	(24.1)	(100.0)	27
30-34	(69.1)	(30.9)	(100.0)	27
35-39	(83.9)	(16.1)	(100.0)	26
40-44	*	*	*	8
45-49	*	*	*	2
Total 15-24	(52.4)	(44.1)	(96.5)	32
Total 15-49	69.8	29.2	99.0	122

[1] Relates to Global AIDS Monitoring 2021 indicator 2.3: Preventing mother-to-child transmission of HIV; and PEPFAR indicator PMTCT_ARV_NAT / SUBNAT: Number and percentage of HIV-positive pregnant women who received antiretroviral medicine during pregnancy to reduce the risk of mother-to-child transmission.
( ) Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.
* Estimates based on a denominator less than 25 have been suppressed.
Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

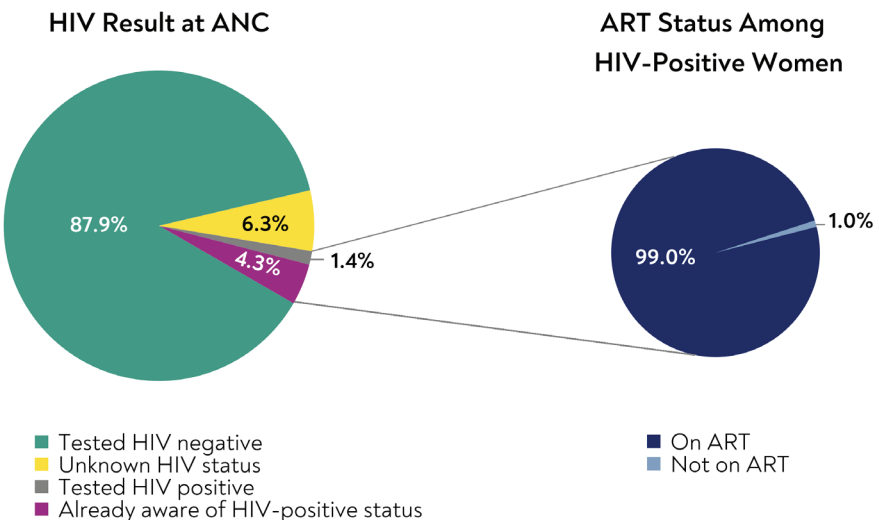

Figure 11.3
Self-reported HIV testing status and antiretroviral therapy use during antenatal care among mothers aged 15-49 years who delivered in the 12 months before the survey, MPHIA 2020-2021

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

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

Percent distribution of last-born children born to women aged 15-49 years in the three years before the survey by breastfeeding status reported by their mothers, by child's age and mother's HIV status, MPHIA 2020-2021

Characteristic	Never breastfed	Ever breastfed, but not currently breastfeeding	Currently breastfeeding	Total	Number
Child's age (months)					
0-1	1.4	5.4	93.2	100.0	324
2-3	1.3	6.4	92.3	100.0	300
4-5	0.5	6.2	93.2	100.0	318
6-8	0.5	6.1	93.4	100.0	421
9-11	0.2	5.0	94.8	100.0	416
12-17	0.4	16.6	83.0	100.0	797
18-23	0.6	32.5	67.0	100.0	645
24-36	1.1	85.0	13.9	100.0	1,255
Result of mother's MPHIA survey HIV test					
HIV positive	1.3	43.0	55.7	100.0	366
HIV negative	1.0	33.6	65.4	100.0	3,564
Not tested	0.4	28.3	71.3	100.0	652
Total	0.9	33.5	65.6	100.0	4,582

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

Among self-reported HIV-positive women aged 15-49 years who delivered within the 3 years before the survey, percentage who reported their last-born infant had an HIV test done within 2 months of birth and within 12 months of birth, by result of infant's HIV test, MPHIA 2020-2021

Characteristic	Percentage of infants who had an HIV test within 2 months of age[1,2]	Percentage of infants who had an HIV test between 2 and 12 months of age[2]	Number of infants born in the 3 years before the survey to HIV-positive women[3]
Result of infant's HIV test			
HIV positive	*	*	4
HIV negative	16.1	53.9	203
Don't know/other	*	*	24
Total	18.5	45.7	260

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

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

Among HIV-positive women aged 15-49 years, percentage with viral load suppression (VLS) (HIV RNA < 1,000 copies/milliliter), by self-reported pregnancy and postpartum-related characteristics, MPHIA 2020-2021

Characteristic	Percentage with VLS	Number
Ever pregnant		
Yes	87.9	1,293
No	74.6	59
Pregnancy status		
Pregnant at time of the survey	74.6	72
Not pregnant at time of the survey	88.1	1,270
Timing of delivery among those who delivered in the three years before the survey		
Delivered in the 12 months before the survey	92.9	135
Delivered in the 3 years before the survey	88.7	365
Breastfeeding status among those who delivered in the three years before the survey		
Never breastfed	*	7
Ever breastfed, but not currently breastfeeding	83.5	220
Currently breastfeeding	91.7	206

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

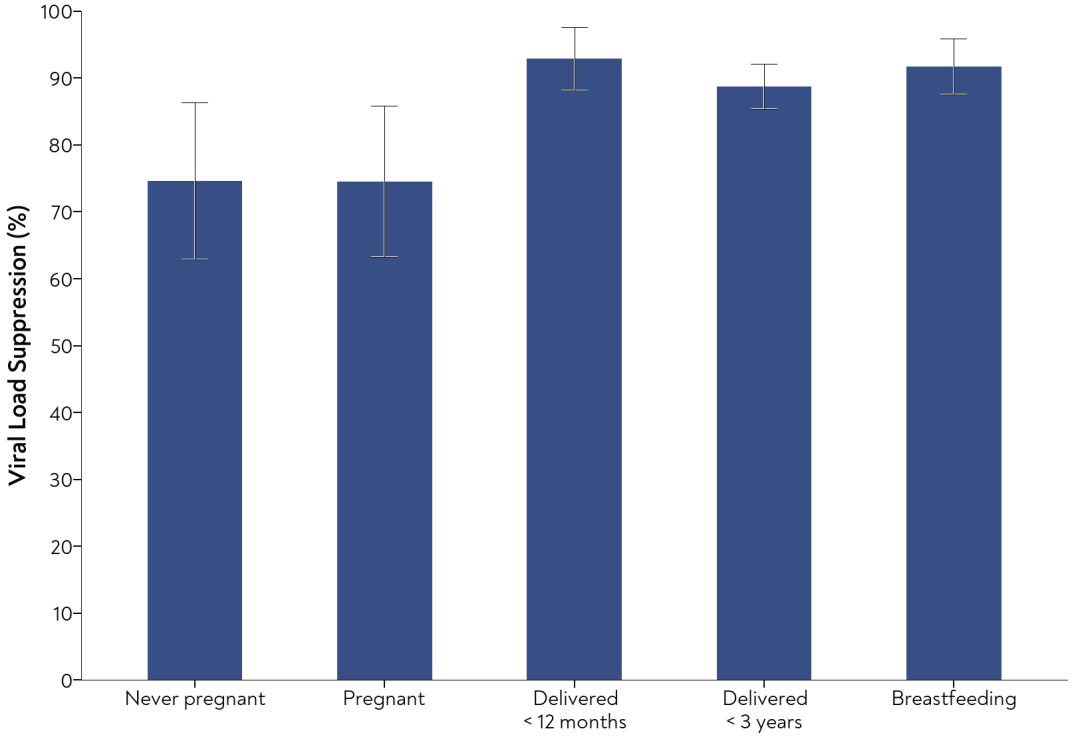

Figure 11.6
Viral load suppression among women aged 15-49 years by pregnancy status, postpartum timing, and breastfeeding status at time of survey, MPHIA 2020-2021

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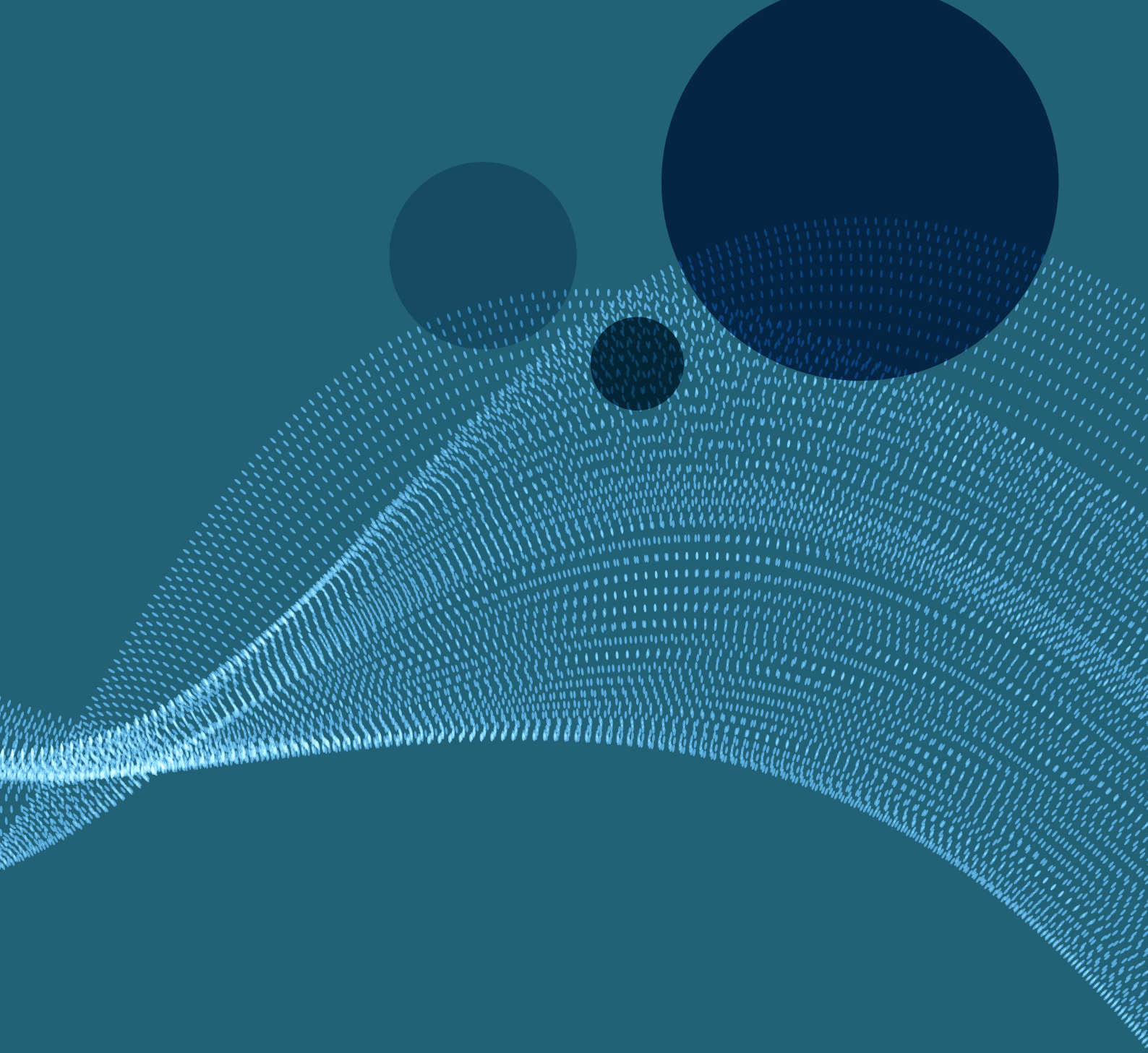

12. HIV RISK FACTORS AND PREVENTION INTERVENTIONS

12.1 BACKGROUND

This chapter describes the prevalence of sexual behaviors that increase the risk of HIV infection as well as the uptake of key HIV prevention methods. MPHIA 2020-2021 provides evidence on high-risk behaviors, including early sexual debut, number of lifetime sexual partners, and recent engagement in multiple sexual partnerships among adults in Malawi. The report also presents data on the use of proven HIV prevention interventions including condom use, male circumcision, and PrEP (pre-exposure prophylaxis—the use of ARVs to prevent HIV acquisition).

Risk taking behavior among young adolescents (ages 10-14 years) and young people (ages 15-24 years) is a particularly important challenge for long-term epidemic control. Young people are particularly more likely to engage in risky sexual behaviors than older adults and have less frequent contact with the healthcare system.[1] Although young adolescents were not included in MPHIA 2020-2021, Table 12.3 shows the prevalence of early sexual debut before 15 years of age self-reported by young people in Malawi, by sex, health zone, and other selected sociodemographic characteristics that may identify where young adolescents and young people may benefit from enhanced HIV education and prevention efforts.

Although the scale-up of universal testing and treatment is expected to lead to reduced HIV transmission, eliminating HIV transmission will require a combination of prevention options that can meet the current needs of different people.[2] Condoms remain an inexpensive and effective tool that can prevent HIV, sexually transmitted infections, and unwanted pregnancies. MPHIA 2020-2021 asked participants about their condom use at last sexual intercourse, particularly with nonmarital, noncohabitating partners (Tables 12.4.A, 12.4.B, 12.4.C). Since 2007, WHO and UNAIDS have also recommended voluntary medical male circumcision as a cost-effective strategy to reduce male acquisition of HIV.[3] To inform the national voluntary medical male circumcision program, MPHIA 2020-2021 asked men whether they had been medically or traditionally circumcised (Table 12.5). Finally, PrEP, the use of ARVs by people at risk for HIV to prevent HIV acquisition, has become an important prevention tool among some populations and in regions with the highest HIV prevalence.[4] Tables 12.6, 12.7, and 12.8 describe the knowledge levels and acceptability of and update of PrEP among adults in Malawi at the time of the survey.

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

12.2 RESULTS

The following tables present MPHIA 2020-2021 data on HIV risk factors and uptake of prevention interventions by demographic characteristics.

Table 12.1 Sexual behavior by demographic characteristics

Percent distribution of self-reported sexual behavior characteristics among adults aged 15 years and older by sex, MPHIA 2020-2021

Charasteristic	Men		Women		Total	
	Percent	Number	Percent	Number	Percent	Number
Ever had sex						
Yes	91.5	10,113	91.5	14,328	91.5	24,441
No	8.5	877	8.5	982	8.5	1,859
Had sex in the 12 months before the survey						
Yes	74.2	8,052	66.9	10,056	70.4	18,108
No	17.2	1,875	24.2	3,688	20.9	5,563
Never had sex	8.6	877	8.8	982	8.7	1,859
Had sexual intercourse before the age of 15						
Yes	14.1	1,455	8.1	1,179	10.9	2,634

Table 12.1 Sexual behavior by demographic characteristics (continued)

Percent distribution of self-reported sexual behavior characteristics among adults aged 15 years and older by sex, MPHIA 2020-2021

Charasteristic	Men		Women		Total	
	Percent	Number	Percent	Number	Percent	Number
No	77.0	8,049	82.9	12,215	80.1	20,264
Never had sex	8.9	877	9.0	982	9.0	1,859
Total 15-24	36.5	3,951	35.7	5,016	36.0	8,967
Total 15-49	84.0	9,113	83.0	12,687	83.4	21,800
Total 50+	16.0	2,001	17.0	2,718	16.6	4,719
Total 15+	100.0	11,114	100.0	15,405	100.0	26,519

Table 12.2 HIV prevalence by sexual behavior

Prevalence of HIV among adults aged 15 years and older by sex and self-reported sexual behavior characteristics, MPHIA 2020-2021

Charasteristic	Men		Women		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
Age at first sexual intercourse						
Under 15	5.4	1,275	14.0	1,039	8.8	2,314
15-19	7.4	4,668	10.7	8,305	9.3	12,973
20-24	7.6	1,818	12.5	1,881	9.8	3,699
25+	10.5	522	13.1	216	11.1	738
Number of lifetime sexual partners						
0	1.9	812	1.4	929	1.6	1,741
1	3.5	1,616	5.5	5,314	5.0	6,930
2+	8.5	6,979	16.6	6,662	11.9	13,641
Number of sexual partners in the 12 months before the survey						
0	7.9	1,607	14.4	3,093	11.9	4,700
1	7.7	5,110	10.2	8,017	9.1	13,127
2+	6.8	1,891	13.3	334	7.6	2,225
Condom use at last sexual intercourse in the 12 months before the survey						
Used condom	8.1	1,663	19.6	1,134	12.2	2,797
Did not use condom	7.3	5,334	8.8	7,210	8.1	12,544
No sexual intercourse in the 12 months before the survey	7.9	1,607	14.4	3,093	11.9	4,700
Total 15-24	1.4	3,412	2.8	4,207	2.1	7,619
Total 15-49	5.8	7,846	10.0	10,840	8.0	18,686
Total 50+	14.0	1,749	12.9	2,227	13.4	3,976
Total 15+	7.1	9,595	10.5	13,067	8.9	22,662

Table 12.3 Sex before the age of 15 years

Percentage of young people aged 15-24 years who reported that they had sexual intercourse before the age of 15 years by sex and selected demographic characteristics, MPHIA 2020-2021

Charasteristic	Men		Women		Total	
	Percentage who had sex before the age of 15 years	Number	Percentage who had sex before the age of 15 years	Number	Percentage who had sex before the age of 15 years	Number
Residence						
Urban	15.3	779	7.3	936	11.3	1,715
Rural	21.9	3,013	10.0	3,904	15.6	6,917
Zone						
North	19.1	463	10.3	482	14.9	945
Central East	21.0	665	8.1	756	14.7	1,421
Central West	18.7	529	8.8	678	13.5	1,207
Lilongwe City	14.2	238	9.7	310	11.9	548
South East	25.9	822	10.6	1,244	17.3	2,066
South West	22.6	802	10.6	1,071	16.1	1,873
Blantyre City	13.7	273	6.0	299	9.9	572
Marital status						
Never married	21.6	2,984	8.1	2,095	16.1	5,079
Married or living together	16.6	701	10.6	2,274	12.2	2,975
Divorced or separated	19.0	102	12.8	455	14.2	557
Widowed	*	0	*	12	*	12
Education						
No education	17.4	73	13.0	164	14.5	237
Primary	24.2	2,316	11.8	3,205	17.5	5,521
Secondary	15.3	1,296	4.1	1,359	10.0	2,655
More than secondary	5.6	104	1.6	111	3.8	215
Wealth quintile						
Lowest	22.3	553	11.1	920	15.8	1,473
Second	22.5	697	10.6	952	16.2	1,649
Middle	24.9	775	9.2	935	16.9	1,710
Fourth	19.7	896	10.2	980	15.1	1,876
Highest	14.9	870	6.6	1,051	10.7	1,921
Age						
15-19	26.2	2,012	10.2	2,209	17.9	4,221
20-24	14.0	1,780	8.7	2,631	11.2	4,411
Total 15-24	20.6	3,792	9.5	4,840	14.8	8,632

* Estimates based on a denominator less than 25 have been suppressed.
Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

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

Among men aged 15 years and older, self-reported condom use with nonmarital, noncohabitating partners in the 12 months before the survey by selected demographic characteristics, MPHIA 2020-2021

Charasteristic	Among men who reported having sex in the 12 months before the survey		Among men who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey	
	Percentage who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey[1]	Number	Percentage who reported using a condom the last time they had sex with a such a partner[2]	Number
Residence				
Urban	43.6	1,336	59.4	574
Rural	34.7	6,696	53.9	2,211
Zone				
North	36.2	1,006	65.4	337
Central East	38.5	1,432	67.3	518
Central West	30.6	1,203	50.1	346
Lilongwe City	42.5	415	61.2	171
South East	37.8	1,745	47.3	620
South West	34.8	1,799	46.2	598
Blantyre City	45.2	432	52.9	195
Marital status				
Never married	88.4	1,828	65.9	1,610
Married or living together	15.5	5,830	39.8	861
Divorced or separated	85.2	342	37.0	286
Widowed	(86.8)	28	*	24
Education				
No education	16.9	563	40.1	93
Primary	34.7	4,719	52.5	1,549
Secondary	42.9	2,358	59.7	993
More than secondary	39.3	384	58.8	148
Wealth quintile				
Lowest	30.8	1,305	50.6	385
Second	32.1	1,611	54.6	497
Middle	33.9	1,632	56.2	533
Fourth	39.2	1,788	54.4	662
Highest	43.4	1,694	57.6	708
Age				
15-19	89.2	914	67.6	808
20-24	59.3	1,383	60.2	790
25-29	33.1	1,109	51.3	354
30-34	23.7	962	50.4	227
35-39	23.0	863	40.2	194
40-44	19.2	742	30.4	147
45-49	17.2	639	35.7	108
50-54	14.3	410	33.5	57
55-59	12.4	296	17.4	36
60-64	12.1	261	26.8	30

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

Among men aged 15 years and older, self-reported condom use with nonmarital, noncohabitating partners in the 12 months before the survey by selected demographic characteristics, MPHIA 2020-2021

Charasteristic	Among men who reported having sex in the 12 months before the survey		Among men who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey	
	Percentage who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey[1]	Number	Percentage who reported using a condom the last time they had sex with such a partner[2]	Number
65+	7.4	453	15.5	34
Total 15-24	71.5	2,297	64.0	1,598
Total 15-49	40.9	6,612	56.6	2,628
Total 50+	11.5	1,420	25.1	157
Total 15+	36.2	8,032	55.0	2,785

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

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

Among women aged 15 years and older, self-reported condom use with nonmarital, noncohabitating partners in the 12 months before the survey by selected demographic characteristics, MPHIA 2020-2021

Charasteristic	Among women who reported having sex in the 12 months before the survey		Among women who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey	
	Percentage who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey[1]	Number	Percentage who reported using a condom the last time they had sex with such a partner[2]	Number
Residence				
Urban	26.2	1,803	46.4	443
Rural	19.1	7,903	37.6	1,454
Zone				
North	15.8	1,035	56.9	151
Central East	15.7	1,462	48.2	211
Central West	15.7	1,343	38.1	188
Lilongwe City	27.0	621	42.7	152
South East	24.0	2,415	36.0	545
South West	23.9	2,260	31.7	505
Blantyre City	26.4	570	41.5	145
Marital status				
Never married	81.1	959	56.4	770
Married or living together	3.2	7,617	27.0	249
Divorced or separated	77.0	986	23.0	772
Widowed	75.8	136	40.5	102
Education				
No education	10.0	1,170	35.2	120
Primary	18.3	6,253	34.2	1,101

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

Among women aged 15 years and older, self-reported condom use with nonmarital, noncohabitating partners in the 12 months before the survey by selected demographic characteristics, MPHIA 2020-2021

Charasteristic	Among women who reported having sex in the 12 months before the survey		Among women who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey	
	Percentage who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey[1]	Number	Percentage who reported using a condom the last time they had sex with such a partner[2]	Number
Secondary	30.1	2,005	48.3	576
More than secondary	37.2	271	54.0	99
Wealth quintile				
Lowest	19.5	1,714	25.9	328
Second	17.0	1,910	32.9	320
Middle	19.7	1,981	43.0	378
Fourth	19.5	1,999	42.9	369
Highest	25.4	2,098	47.9	500
Age				
15-19	54.7	1,017	55.3	540
20-24	22.4	2,038	39.1	459
25-29	16.2	1,751	31.0	292
30-34	15.1	1,289	20.9	202
35-39	13.2	1,265	22.3	177
40-44	12.5	793	32.8	102
45-49	11.5	626	30.8	76
50-54	5.1	341	*	19
55-59	5.1	245	*	12
60-64	5.1	165	*	10
65+	4.0	176	*	8
Total 15-24	35.1	3,055	49.0	999
Total 15-49	21.9	8,779	39.9	1,848
Total 50+	4.9	927	(26.3)	49
Total 15+	20.3	9,706	39.6	1,897

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

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

Among adults aged 15 years and older, self-reported condom use with nonmarital, noncohabitating partners in the 12 months before the survey by selected demographic characteristics, MPHIA 2020-2021

Charasteristic	Among persons who reported having sex in the 12 months before the survey		Among persons who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey	
	Percentage who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey[1]	Number	Percentage who reported using a condom the last time they had sex with a such a partner[2]	Number
Residence				
Urban	34.9	3,139	54.4	1,017
Rural	27.1	14,599	48.3	3,665
Zone				
North	26.8	2,041	63.1	488
Central East	28.3	2,894	62.5	729
Central West	23.5	2,546	46.3	534
Lilongwe City	34.4	1,036	53.5	323
South East	30.5	4,160	42.6	1,165
South West	29.4	4,059	40.2	1,103
Blantyre City	35.7	1,002	48.6	340
Marital status				
Never married	86.1	2,787	63.1	2,380
Married or living together	9.3	13,447	37.5	1,110
Divorced or separated	79.6	1,328	27.6	1,058
Widowed	77.8	164	42.3	126
Education				
No education	12.6	1,733	37.7	213
Primary	26.3	10,972	45.9	2,650
Secondary	37.8	4,363	56.1	1,569
More than secondary	38.6	655	57.2	247
Wealth quintile				
Lowest	25.1	3,019	40.7	713
Second	24.7	3,521	47.3	817
Middle	27.0	3,613	51.4	911
Fourth	30.0	3,787	50.9	1,031
Highest	34.6	3,792	54.1	1,208
Age				
15-19	71.5	1,931	62.7	1,348
20-24	39.9	3,421	53.9	1,249
25-29	24.4	2,860	44.2	646
30-34	19.3	2,251	38.6	429
35-39	18.1	2,128	33.5	371
40-44	16.0	1,535	31.3	249
45-49	14.6	1,265	33.9	184
50-54	10.5	751	33.3	76
55-59	9.5	541	(21.6)	48

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

Among adults aged 15 years and older, self-reported condom use with nonmarital, noncohabitating partners in the 12 months before the survey by selected demographic characteristics, MPHIA 2020-2021

Charasteristic	Among persons who reported having sex in the 12 months before the survey		Among persons who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey	
	Percentage who reported having sex with a nonmarital, noncohabitating partner in the 12 months before the survey[1]	Number	Percentage who reported using a condom the last time they had sex with a such a partner[2]	Number
60-64	9.7	426	(23.4)	40
65+	6.5	629	(14.7)	42
Total 15-24	52.6	5,352	58.8	2,597
Total 15-49	31.3	15,391	50.6	4,476
Total 50+	9.1	2,347	25.3	206
Total 15+	28.5	17,738	49.6	4,682

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

Figure 12.4
Self-reported sex and condom use at last sex with a nonmarital, noncohabitating partner in the 12 months before the survey, MPHIA 2020-2021

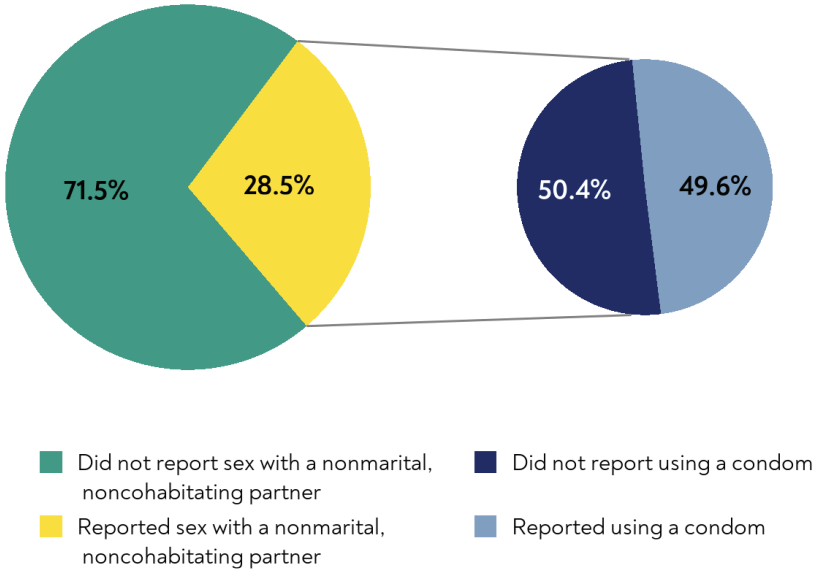

Table 12.5 Male circumcision

Percent distribution of men aged 15 years and older by self-reported circumcision status, by result of MPHIA HIV test and selected demographic characteristics, MPHIA 2020-2021

Charasteristic	Circumcised[1]		Uncircumcised	Total	*Number*
	Medical circumcision	Nonmedical circumcision			
Result of MPHIA HIV test					
HIV positive	12.7	22.1	65.3	100.0	763
HIV negative	15.5	17.6	66.9	100.0	8,788
Not tested	15.2	19.1	65.7	100.0	1,509
Residence					
Urban	24.8	16.6	58.6	100.0	2,031
Rural	13.1	18.5	68.4	100.0	9,029
Zone					
North	7.1	4.3	88.5	100.0	1,351
Central East	8.7	10.4	80.9	100.0	1,947
Central West	7.2	3.8	89.1	100.0	1,634
Lilongwe City	20.3	14.8	65.0	100.0	618
South East	20.6	53.8	25.6	100.0	2,344
South West	24.8	18.1	57.2	100.0	2,469
Blantyre City	32.1	21.5	46.5	100.0	697
Marital status					
Never married	24.1	13.2	62.7	100.0	3,542
Married or living together	10.5	20.7	68.8	100.0	6,858
Divorced or separated	14.2	19.0	66.9	100.0	535
Widowed	8.7	21.6	69.7	100.0	119
Education					
No education	6.4	24.9	68.7	100.0	763
Primary	11.2	20.1	68.7	100.0	6,593
Secondary	23.3	14.4	62.4	100.0	3,166
More than secondary	28.7	7.6	63.7	100.0	530
Wealth quintile					
Lowest	10.2	17.2	72.7	100.0	1,725
Second	11.0	18.9	70.1	100.0	2,103
Middle	13.3	19.7	67.0	100.0	2,234
Fourth	15.2	19.4	65.5	100.0	2,526
Highest	24.4	15.5	60.1	100.0	2,469
Age					
15-19	24.9	13.0	62.1	100.0	2,095
20-24	22.1	16.0	61.8	100.0	1,841
25-29	18.5	17.8	63.7	100.0	1,344
30-34	13.8	18.6	67.6	100.0	1,122
35-39	9.8	19.1	71.2	100.0	1,024
40-44	6.5	21.3	72.1	100.0	884
45-49	8.7	22.4	68.9	100.0	770
50-54	6.3	20.4	73.3	100.0	513

Table 12.5 Male circumcision (continued)

Percent distribution of men aged 15 years and older by self-reported circumcision status, by result of MPHIA HIV test and selected demographic characteristics, MPHIA 2020-2021

Charasteristic	Circumcised[1]		Uncircumcised	Total	*Number*
	Medical circumcision	Nonmedical circumcision			
55-59	3.7	22.0	74.3	100.0	389
60-64	3.1	19.8	77.1	100.0	330
65+	2.3	27.2	70.4	100.0	748
Total 15-24	23.6	14.4	62.0	100.0	3,936
Total 15-49	17.4	17.2	65.4	100.0	9,080
Total 50+	3.9	22.9	73.2	100.0	1,980
Total 15+	15.3	18.1	66.6	100.0	11,060

[1] Relates to Global AIDS Monitoring 2021 indicator 3.16: Prevalence of male circumcision; and PEPFAR indicator VMMC_TOTALCIRC NAT / SUBNAT: Total number of men ever circumcised.
Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

Figure 12.5
Self-reported male circumcision status by survey HIV test result, MPHIA 2020-2021

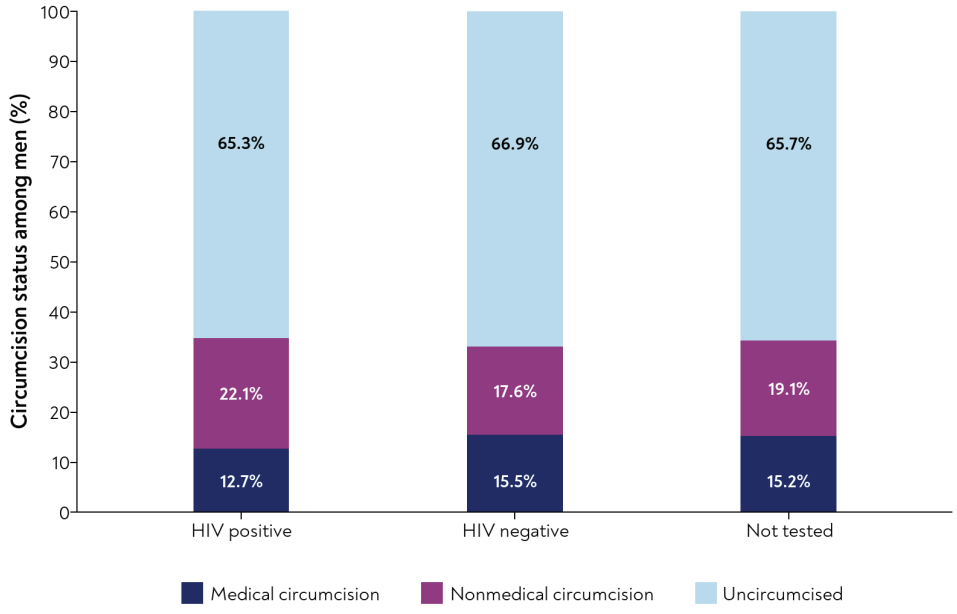

Table 12.6 Self-reported knowledge of pre-exposure prophylaxis

Among persons aged 15 years and older, percentage who reported they had heard of pre-exposure prophylaxis (PrEP), by selected demographic characteristics, MPHIA 2020-2021

Charasteristic	Men		Women		Total	
	Percentage who had heard of PrEP	Number	Percentage who had heard of PrEP	Number	Percentage who had heard of PrEP	Number
Residence						
Urban	25.1	2,034	19.5	2,804	22.2	4,838
Rural	15.9	9,026	10.8	12,516	13.2	21,542
Zone						
North	20.0	1,367	14.0	1,560	17.1	2,927
Central East	15.6	1,952	9.6	2,324	12.6	4,276
Central West	13.0	1,641	8.8	2,135	10.8	3,776
Lilongwe City	22.2	618	18.4	956	20.1	1,574
South East	17.7	2,328	12.3	3,783	14.7	6,111
South West	19.0	2,459	13.5	3,683	16.0	6,142
Blantyre City	25.8	695	20.3	879	23.0	1,574
Marital status						
Never married	18.4	3,542	13.9	2,521	16.6	6,063
Married or living together	17.1	6,856	12.5	9,243	14.7	16,099
Divorced or separated	17.7	536	12.4	2,186	13.7	2,722
Widowed	18.0	121	7.2	1,348	8.2	1,469
Education						
No education	10.6	762	8.6	2,232	9.2	2,994
Primary	13.6	6,593	10.6	9,671	12.0	16,264
Secondary	22.8	3,165	16.8	2,998	20.2	6,163
More than secondary	43.3	531	42.4	395	43.0	926
Wealth quintile						
Lowest	13.1	1,720	8.6	2,811	10.6	4,531
Second	12.5	2,100	9.8	2,829	11.1	4,929
Middle	15.8	2,237	11.6	3,253	13.5	5,490
Fourth	17.6	2,527	11.9	3,226	14.7	5,753
Highest	26.7	2,473	19.3	3,197	23.0	5,670
Age						
15-19	14.4	2,090	11.8	2,302	13.0	4,392
20-24	18.1	1,839	12.9	2,687	15.4	4,526
25-29	20.4	1,340	14.8	2,184	17.5	3,524
30-34	21.2	1,125	15.0	1,662	17.9	2,787
35-39	19.6	1,023	14.0	1,658	16.6	2,681
40-44	18.6	885	14.3	1,180	16.4	2,065
45-49	17.1	768	11.1	947	14.1	1,715
50-54	16.9	514	10.2	645	13.5	1,159
55-59	17.1	390	8.0	528	12.4	918
60-64	15.7	330	8.7	469	11.9	799
65+	10.5	756	4.7	1,058	7.1	1,814

Table 12.6 Self-reported knowledge of pre-exposure prophylaxis (continued)

Among persons aged 15 years and older, percentage who reported they had heard of pre-exposure prophylaxis (PrEP), by selected demographic characteristics, MPHIA 2020-2021

Charasteristic	Men		Women		Total	
	Percentage who had heard of PrEP	Number	Percentage who had heard of PrEP	Number	Percentage who had heard of PrEP	Number
Total 15-24	16.1	3,929	12.3	4,989	14.1	8,918
Total 15-49	18.1	9,070	13.4	12,620	15.6	21,690
Total 50+	14.6	1,990	7.4	2,700	10.7	4,690
Total 15+	17.6	11,060	12.4	15,320	14.8	26,380

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

Table 12.7 Willingness to take pre-exposure prophylaxis

Among persons aged 15 years and older who were HIV negative, percentage who reported they would take pre-exposure prophylaxis (PrEP) to prevent HIV by selected demographics characteristics, MPHIA 2020-2021

Charasteristic	Men		Women		Total	
	Percentage who would take PrEP	Number	Percentage who would take PrEP	Number	Percentage who would take PrEP	Number
Heard of PrEP						
Yes	80.9	1,454	80.2	1,371	80.6	2,825
No	71.3	7,166	65.5	9,759	68.2	16,925
Residence						
Urban	72.3	1,477	67.7	1,879	69.9	3,356
Rural	73.0	7,174	67.1	9,288	70.0	16,462
Zone						
North	75.9	1,106	72.6	1,236	74.3	2,342
Central East	75.5	1,688	66.4	1,952	71.1	3,640
Central West	67.1	1,288	62.4	1,599	64.7	2,887
Lilongwe City	69.4	432	64.4	623	66.7	1,055
South East	77.5	1,811	72.2	2,729	74.6	4,540
South West	71.0	1,818	65.5	2,480	68.1	4,298
Blantyre City	74.7	508	68.8	548	71.8	1,056
Marital status						
Never married	73.7	2,976	66.8	2,006	71.0	4,982
Married or living together	72.1	5,196	68.7	6,876	70.4	12,072
Divorced or separated	78.8	398	71.0	1,488	72.9	1,886
Widowed	60.6	76	49.5	781	50.6	857
Education						
No education	69.2	570	59.0	1,496	62.1	2,066
Primary	72.7	5,188	68.1	7,171	70.2	12,359
Secondary	74.3	2,522	70.7	2,234	72.7	4,756
More than secondary	71.7	365	59.8	248	67.6	613

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

Among persons aged 15 years and older who were HIV negative, percentage who reported they would take pre-exposure prophylaxis (PrEP) to prevent HIV by selected demographics characteristics, MPHIA 2020-2021

Charasteristic	Men		Women		Total	
	Percentage who would take PrEP	Number	Percentage who would take PrEP	Number	Percentage who would take PrEP	Number
Wealth quintile						
Lowest	71.0	1,422	65.9	2,117	68.2	3,539
Second	73.4	1,726	70.1	2,153	71.7	3,879
Middle	75.2	1,733	66.3	2,381	70.5	4,114
Fourth	72.8	1,962	66.7	2,317	69.8	4,279
Highest	71.9	1,806	67.1	2,198	69.5	4,004
Age						
15-19	73.4	1,773	68.8	1,868	71.0	3,641
20-24	75.5	1,534	71.4	2,123	73.4	3,657
25-29	75.6	1,064	73.5	1,649	74.5	2,713
30-34	73.1	870	68.1	1,181	70.6	2,051
35-39	73.7	801	69.8	1,091	71.8	1,892
40-44	73.1	628	69.5	782	71.3	1,410
45-49	71.6	516	65.7	626	68.6	1,142
50-54	69.9	357	66.9	426	68.4	783
55-59	74.7	277	58.2	365	65.8	642
60-64	68.1	247	55.5	342	61.3	589
65+	57.9	584	41.4	714	48.5	1,298
Total 15-24	74.4	3,307	70.0	3,991	72.1	7,298
Total 15-49	74.1	7,186	70.0	9,320	72.0	16,506
Total 50+	66.2	1,465	53.0	1,847	59.0	3,312
Total 15+	72.9	8,651	67.2	11,167	70.0	19,818

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

Table 12.8 Ever taken pre-exposure prophylaxis

Among persons aged 15 years and older who were HIV negative and who had been offered pre-exposure prophylaxis (PrEP) to prevent HIV, percentage who reported they had ever taken it, by selected demographic characteristics, MPHIA 2020-2021

Charasteristic	Men		Women		Total	
	Percentage who had ever taken PrEP	Number	Percentage who had ever taken PrEP	Number	Percentage who had ever taken PrEP	Number
Residence						
Urban	(49.1)	40	(32.2)	26	43.2	66
Rural	38.7	108	13.8	70	30.1	178
Zone						
North	*	23	*	12	(43.5)	35
Central East	(23.1)	26	*	11	(16.8)	37

Table 12.8 Ever taken pre-exposure prophylaxis (continued)

Among persons aged 15 years and older who were HIV negative and who had been offered pre-exposure prophylaxis (PrEP) to prevent HIV, percentage who reported they had ever taken it, by selected demographic characteristics, MPHIA 2020-2021

Charasteristic	Men		Women		Total	
	Percentage who had ever taken PrEP	Number	Percentage who had ever taken PrEP	Number	Percentage who had ever taken PrEP	Number
Central West	*	12	*	9	*	21
Lilongwe City	*	11	*	10	*	21
South East	(38.8)	32	*	23	27.5	55
South West	(38.0)	34	(34.6)	25	36.7	59
Blantyre City	*	10	*	6	*	16
Marital status						
Never married	(36.2)	48	*	22	31.4	70
Married or living together	44.3	89	20.3	56	36.3	145
Divorced or separated	*	10	*	16	(26.6)	26
Widowed	*	1	*	2	*	3
Education						
No education	*	5	*	9	*	14
Primary	32.8	58	14.2	59	24.3	117
Secondary	43.1	66	*	24	37.1	90
More than secondary	*	19	*	4	*	23
Wealth quintile						
Lowest	*	16	*	17	(14.8)	33
Second	*	13	*	16	(27.4)	29
Middle	(35.8)	29	*	19	(28.5)	48
Fourth	(31.0)	30	*	16	(27.6)	46
Highest	52.3	60	(34.8)	28	47.7	88
Age						
15-19	*	24	*	23	(16.6)	47
20-24	(32.4)	25	*	21	(31.1)	46
25-29	(65.6)	26	*	13	(54.9)	39
30-34	*	17	*	12	(49.4)	29
35-39	*	17	*	11	(26.8)	28
40-44	*	17	*	4	*	21
45-49	*	7	*	3	*	10
50-54	*	5	*	5	*	10
55-59	*	4	*	1	*	5
60-64	*	3	*	2	*	5
65+	*	3	*	1	*	4
Total 15-24	(31.0)	49	(14.0)	44	23.5	93
Total 15-49	42.7	133	19.1	87	34.6	220
Total 50+	*	15	*	9	*	24
Total 15+	41.6	148	19.0	96	33.8	244

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

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13. TUBERCULOSIS, CERVICAL CANCER, AND CHRONIC CONDITIONS

13.1 BACKGROUND

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

Women living with HIV are at greater risk of developing cervical cancer because their weakened immune systems are not able to clear human papillomavirus (HPV) infections. WHO recommends HPV screening and treatment for all sexually-active HIV-positive women.[1] Among women living with HIV, WHO recommends that priority should be given to screening those aged 25-49 years, and that when tools are available to manage women living with HIV aged 50-65 years, those in that age bracket who have never been screened should also be prioritized. MPHIA 2020-2021 provides population-based rates of screening unavailable from routine clinic data. This chapter presents cervical cancer screening rates by age and sociodemographic characteristics.

With changes in lifestyle and diet, noncommunicable health conditions, including diabetes, hypertension, heart disease, kidney disease, cancers, lung diseases and depression or other mental health issues have become increasingly important causes of illness and mortality in many communities in low and middle income countries.[2] While it is not clear whether these conditions are more common among people living with HIV, there are some data to suggest that people living with HIV may develop comorbidities at younger ages and may be at higher risk of developing multiple chronic comorbidities.[3] Regardless, as people live longer with HIV on treatment, their care is more likely to require prevention and/or management of chronic health comorbidities.[4] In order to inform national program planning, MPHIA 2020-2021 asked both HIV-negative and HIV-positive participants whether they have been told by a doctor or health worker that they have a chronic health condition.

Finally, TB remains the leading cause of death for people living with HIV, particularly in Africa.[5] HIV infection increases a person's susceptibility to TB infection and dramatically increases the risk of progression of latent TB to active disease.[6, 7] A UNAIDS model estimates there were 4,200 [95% CI 2,300-6,700] TB-related deaths among HIV-positive persons in Malawi in 2020.[8]

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

13.2 RESULTS

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

Table 13.1 Cervical cancer screening among women living with HIV

Among HIV-positive women aged 15 years and older, percentage who reported they had ever received a cervical cancer screening test by selected demographic characteristics, MPHIA 2020-2021

Characteristic	Among HIV-positive women		Among HIV-positive women who reported they had received a cervical cancer screening test	
	Percentage who reported they had ever received a cervical cancer screening test	Number	Percentage with an abnormal result	Number
Residence				
Urban	45.7	376	3.8	170
Rural	35.5	1,319	3.0	483

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

Among HIV-positive women aged 15 years and older, percentage who reported they had ever received a cervical cancer screening test by selected demographic characteristics, MPHIA 2020-2021

Characteristic	Among HIV-positive women		Among HIV-positive women who reported they had received a cervical cancer screening test	
	Percentage who reported they had ever received a cervical cancer screening test	Number	Percentage with an abnormal result	Number
Zone				
North	28.0	112	(5.9)	31
Central East	24.6	113	(0.0)	29
Central West	26.7	109	(6.2)	28
Lilongwe City	45.8	105	(0.0)	47
South East	36.1	514	4.9	186
South West	44.4	597	1.6	265
Blantyre City	47.6	145	5.7	67
Marital status				
Never married	20.9	84	*	20
Married or living together	39.8	902	2.4	364
Divorced or separated	34.9	393	5.0	141
Widowed	41.2	315	3.4	128
Education				
No education	29.5	260	1.2	79
Primary	37.5	1,097	3.4	424
Secondary	44.5	314	3.4	137
More than secondary	*	22	*	13
Wealth quintile				
Lowest	25.0	256	4.8	65
Second	29.8	266	3.8	82
Middle	36.5	366	4.7	138
Fourth	43.1	423	1.7	185
Highest	47.7	383	3.0	182
Age				
15-19	(4.0)	42	*	2
20-24	26.5	108	(0.0)	29
25-29	21.9	166	(6.4)	36
30-34	39.0	236	5.8	91
35-39	42.4	331	2.2	140
40-44	47.3	256	2.3	122
45-49	42.5	219	3.5	97
50-54	48.8	131	2.6	67
55-59	43.6	71	(0.0)	28
60-64	31.3	56	*	17
65+	28.6	79	*	24
Total 15-24	19.0	150	(0.0)	31
Total 15-49	37.3	1,358	3.3	517

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

Among HIV-positive women aged 15 years and older, percentage who reported they had ever received a cervical cancer screening test by selected demographic characteristics, MPHIA 2020-2021

Characteristic	Among HIV-positive women		Among HIV-positive women who reported they had received a cervical cancer screening test	
	Percentage who reported they had ever received a cervical cancer screening test	Number	Percentage with an abnormal result	Number
Total 30-49	42.8	1,042	3.3	450
Total 50+	40.1	337	3.0	136
Total 15+	37.9	1,695	3.3	653

[1] Relates to Global AIDS Monitoring 2021 indicator 10.8: Cervical cancer screening among women living with HIV; and PEPFAR indicator CXCA_SCRN NAT/SUBNAT: Percentage of HIV-positive women on antiretroviral therapy screened for cervical cancer.
( ) Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.
* Estimates based on a denominator less than 25 have been suppressed.
Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

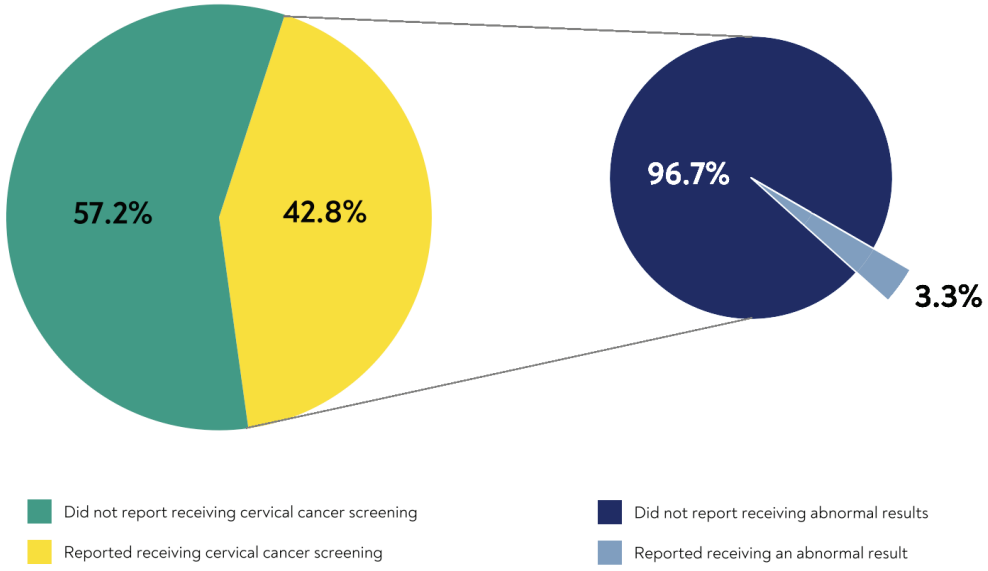

Figure 13.1 Self-reported cervical cancer screening history and abnormal results among HIV-positive women aged 30-49 years, MPHIA 2020-2021

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

Among HIV-positive and HIV-negative adults aged 15 years and older, percentage indicating that they have ever been told by a doctor or health worker that they have chronic health conditions, by self-reported HIV status and antiretroviral therapy (ART) use (adjusted by detection of an antiretroviral [ARV] in blood), MPHIA 2020-2021

Charasteristic	HIV negative		Unaware of HIV status[1]		Aware of HIV status and not on ART[1]		Aware of HIV status and on ART[1]		Total	
	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number
High blood sugar or diabetes										
Yes	0.6	127	1.1	2	0.0	0	0.9	18	0.9	20
No	99.4	19,955	98.9	250	100.0	40	99.1	2,143	99.1	2,436
High blood pressure or hypertension										
Yes	5.2	1,138	4.5	11	0.0	0	5.9	128	5.7	140
No	94.8	18,944	95.5	241	100.0	40	94.1	2,033	94.3	2,316
Heart disease or chronic heart condition										
Yes	2.0	399	0.9	3	0.0	0	1.1	25	1.1	28
No	98.0	19,683	99.1	249	100.0	40	98.9	2,136	98.9	2,428
Kidney disease										
Yes	0.2	36	0.4	1	3.5	1	0.3	8	0.4	10
No	99.8	20,046	99.6	251	96.5	39	99.7	2,153	99.6	2,446
Cancer or tumor										
Yes	0.7	152	0.0	0	0.0	0	1.4	32	1.2	32
No	99.3	19,930	100.0	252	100.0	40	98.6	2,129	98.8	2,424
Lung disease or chronic lung condition										
Yes	0.5	93	0.0	0	1.5	1	0.4	10	0.4	11
No	99.5	19,989	100.0	252	98.5	39	99.6	2,151	99.6	2,445
Depression or mental health condition										
Yes	0.3	63	0.0	0	0.0	0	0.1	2	0.1	2
No	99.7	20,019	100.0	252	100.0	40	99.9	2,159	99.9	2,454
Total 15+	100.0	20,082	100.0	252	100.0	40	100.0	2,161	100.0	2,456

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

Table 13.3 HIV testing in tuberculosis clinics

Among adults aged 15 years and older who reported visiting a tuberculosis (TB) clinic in the 12 months before the survey, percentage who reported that they were tested for HIV during a TB clinic visit in that period, by sex and self-reported TB diagnosis, MPHIA 2020-2021

Characteristic	Tested for HIV during a TB clinic visit in the 12 months before the survey	Not tested for HIV during a TB clinic visit in the 12 months before the survey		Total	Number
		Already knew they were HIV positive	Did not know their status		
Sex					
Men	50.0	6.5	43.5	100.0	402
Women	50.3	6.2	43.4	100.0	640
TB Diagnosis in the 12 months before the survey					
Diagnosed with TB	66.2	6.5	27.3	100.0	82
Not diagnosed with TB	48.5	6.4	45.1	100.0	950
Total 15+	50.2	6.3	43.5	100.0	1,042

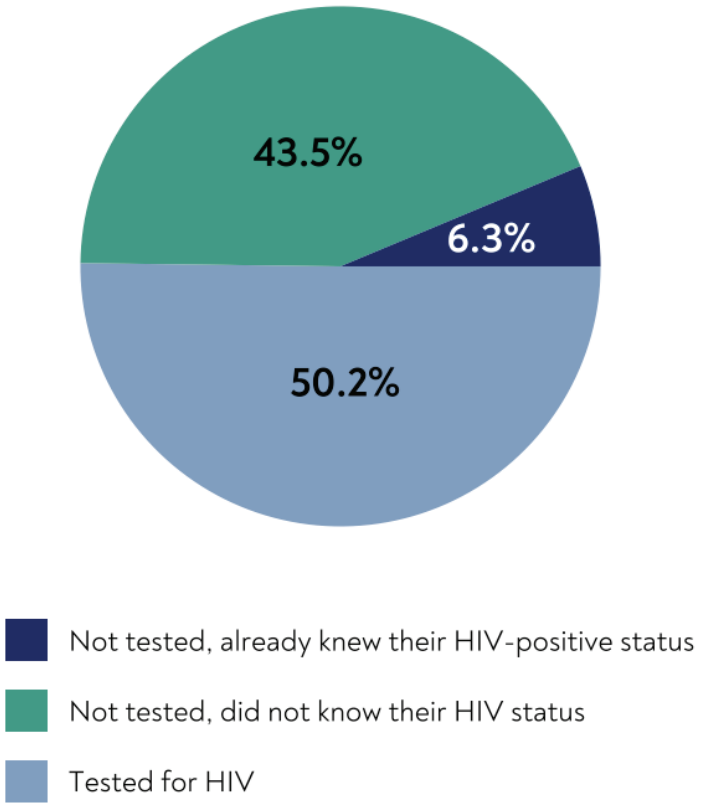

Figure 13.3
Self-reported receipt of HIV testing among adults (ages 15 years and older) in tuberculosis clinics in the 12 months before the survey, MPHIA 2020-2021

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

Among self-reported HIV-positive adults aged 15 years and older, percentage who reported that they had visited a tuberculosis (TB) clinic in the 12 months before the survey; among those who visited a TB clinic during that period, percentage who were diagnosed for TB; and among those diagnosed with TB in that period, percentage who reported receiving treatment for TB, by sex and selected demographic characteristics, MPHIA 2020-2021

Charasteristic	Among HIV-positive adults		Among HIV-positive adults who visited a TB clinic in the 12 months before the survey		Among HIV-positive adults diagnosed with TB in the 12 months before the survey	
	Percentage who visited a TB clinic in the 12 months before the survey	Number	Percentage diagnosed with TB in the 12 months before the survey	Number	Percentage treated for TB in the 12 months before the survey	Number
Sex						
Men	11.2	697	6.5	80	*	5
Women	9.9	1,624	13.5	158	*	22
Residence						
Urban	15.2	521	12.0	77	*	9
Rural	8.9	1,800	10.2	161	*	18
Zone						
North	9.6	165	*	17	*	5
Central East	13.6	144	*	17	*	0
Central West	7.9	157	*	13	*	0
Lilongwe City	14.6	150	*	20	*	4
South East	9.0	686	9.7	60	*	6
South West	8.4	825	12.5	72	*	9
Blantyre City	20.0	194	(7.2)	39	*	3
Age						
15-24	8.1	152	*	13	*	1
25-34	9.3	447	(12.1)	43	*	6
35-44	11.3	795	10.0	87	*	9
45-54	9.9	583	12.3	55	*	7
55-64	9.1	228	*	23	*	1
65+	16.2	116	*	17	*	3
Pregnancy status						
Currently pregnant	4.5	71	*	3	*	0
Not currently pregnant	10.1	1,542	13.8	154	*	22
Total 15-24	8.1	152	*	13	*	1
Total 15-49	9.9	1,744	10.6	171	*	19
Total 50+	11.6	577	11.4	67	*	8
Total 15+	10.3	2,321	10.8	238	(80.6)	27

( ) Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.
* Estimates based on a denominator less than 25 have been suppressed.

Table 13.5 Tuberculosis symptom screening in HIV clinics

Among self-reported HIV-positive adults aged 15 years and older currently in HIV care, percentage who reported that they were screened for tuberculosis (TB) symptoms during their last HIV clinic visit by sex, MPHIA 2020-2021

Characteristic	Percentage screened for TB symptoms[1]	Number
Sex		
Male	59.8	668
Female	54.5	1,559
Total 15+	56.3	2,227

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

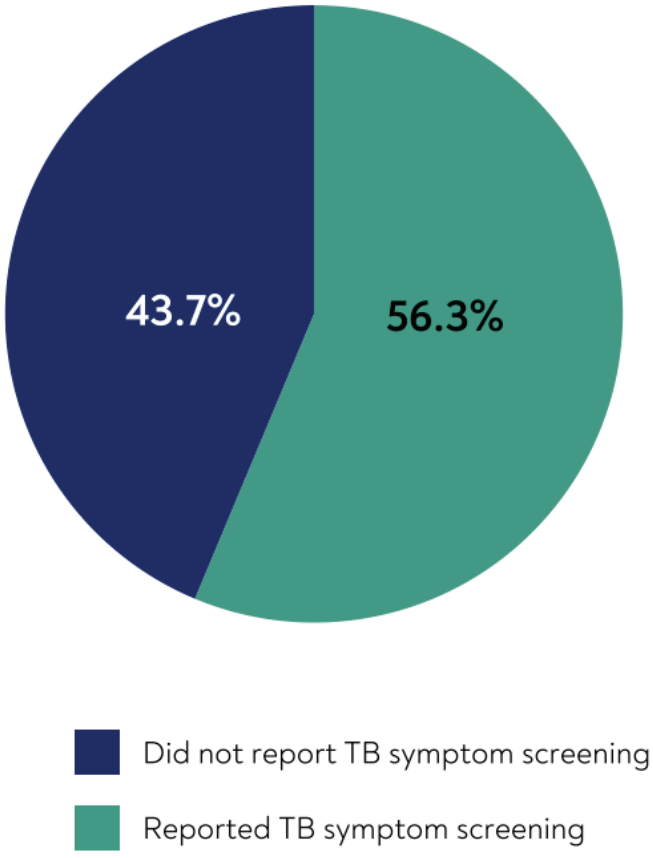

Figure 13.5
Tuberculosis symptom screening at last clinic visit among adults (ages 15 years and older) living with HIV, based on self-report, MPHIA 2020-2021

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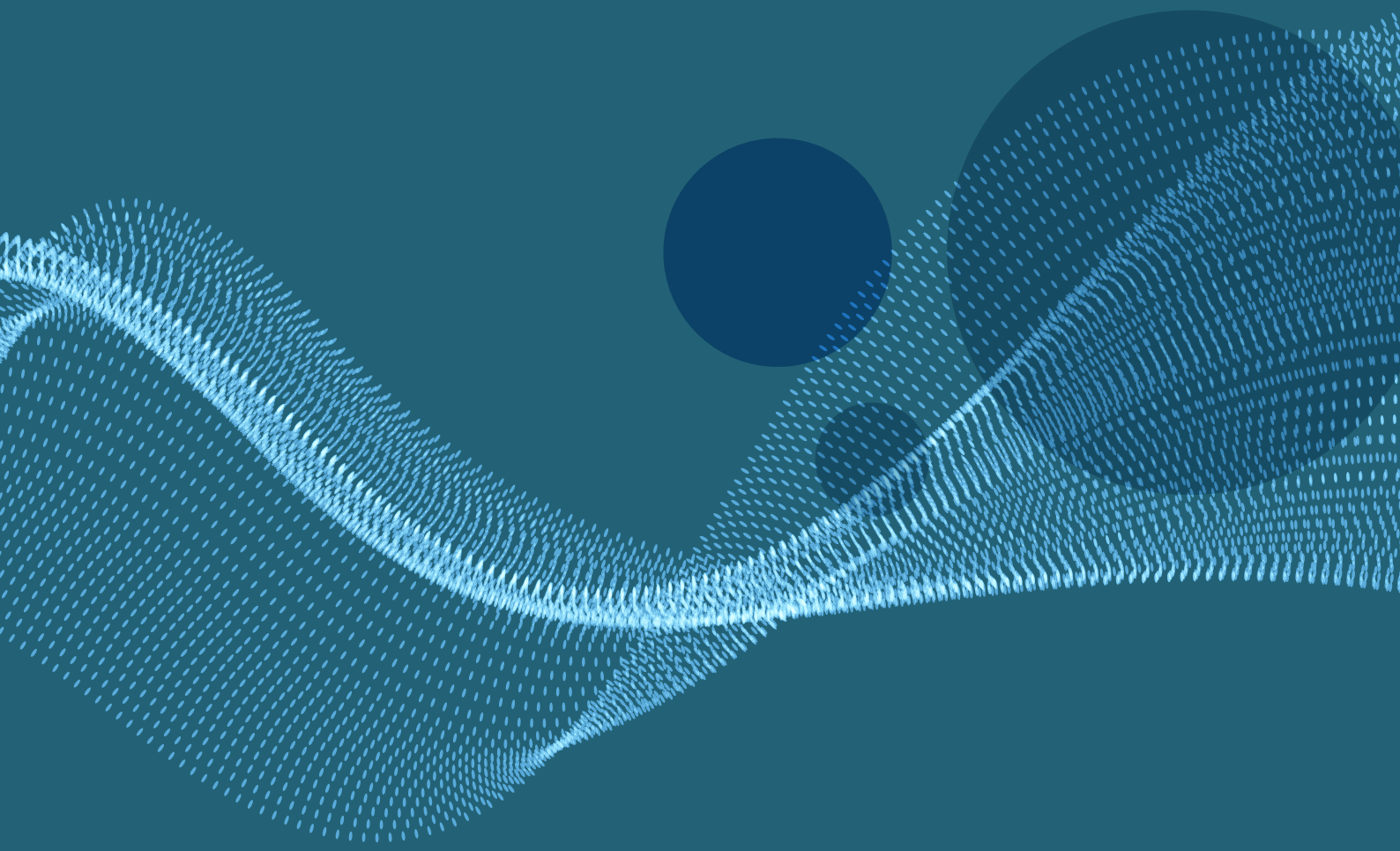

APPENDICES

APPENDIX A SAMPLE DESIGN AND IMPLEMENTATION

Appendix A provides a high-level overview of sampling and weighting procedures for MPHIA 2020-2021. In-depth details are provided in the MPHIA 2020-2021 Sampling and Weighting Technical Report, which may be found on the PHIA Project website.

A.1 SAMPLE DESIGN

Overview

The sample design for the MPHIA 2020-2021 is a stratified multistage probability sample design, with strata defined by the 7 health zones of the country, first-stage sampling units defined by EAs within strata, second-stage sampling units defined by households within EAs, and finally eligible persons within households. Within each health zone, the first-stage sampling units (also referred to as primary sampling unit [PSUs]) were selected with probabilities proportionate to the 2018 Malawi Population and Housing Census.[1] The allocation of the sample PSUs to the 7 health zones was made in a manner designed to achieve specified precision levels for national estimates of the HIV incidence among adults aged 15-49 years, national and subnational-level estimates of VLS among adults aged 15-49 years living with HIV and national estimates of VLS among young women aged 15-24 years living with HIV.

The second-stage sampling units were selected from lists of dwelling units/households compiled by trained staff for each of the sampled PSUs. Upon completion of the listing process, a random systematic sample of dwelling units/households was selected from each PSU at rates designed to yield self-weighting (ie, equal probability) samples within each district, to the extent feasible.

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

Population of Inference

The population of inference for the MPHIA 2020-2021 is comprised of the de facto household population. The de facto population is comprised of individuals who were present in households (ie, slept in the household) on the night prior to the household interview—as opposed to the usual residents of the household who may not have slept there the night before the survey.

Precision Specifications and Assumptions

The following specifications were used to develop the sample design for the MPHIA 2020-2021.

- Relative standard error (RSE) of the national estimate of HIV incidence among adults 15 to 49 years old should be 30% or less.
- 95% CI bounds around the estimated VLS rate among HIV-positive adults aged 15 to 49 years for each of the seven health zones should be ±0.10 or less.
- 95% CI bounds around the national estimate of VLS rate among all HIV-positive adults aged 15 to 49 years should be ±0.025 or less.
- 95% CI bounds around the national estimate of VLS rate among all young women aged 15 to 24 years should be ±0.09 or less.

The following assumptions were used to develop the sample design for the MPHIA 2020-2021.

- National HIV prevalence rate of 0.10 (10.0%) for adults 15-49 years old that varies by zone.[2]
- A national HIV prevalence rate of 0.034 (3.4%) for women aged 15 to 24 years old that varies by zone.[2]
- An annual national incidence rate for adults aged 15-49 of p_a = 0.0033 (0.33%).[2]
- A mean duration of recent infection of 130 days, yielding an annualization rate of 365/130= 2.8077.
- An estimated incidence rate for mean duration of infection = 130 days of p_m = 0.0033/2.8077 = 0.0012 (0.12%). The corresponding district-level estimates are obtained by $p_{mh} = p_{ah}/2.8077$.
- A viral load suppression rate among HIV positive adults aged 15-49 of p_{VLS} = 0.50 (50%) in each zone. This assumption provides a conservative estimate of the underlying population variance associated with VLS rate.
- An intracluster correlation of 0.02 for VLS and 0.01 for prevalence (source: tabulations of MPHIA 2015-2016 data).[2]
- An intracluster correlation of 0.000 for incidence (source: analyses of prior PHIA surveys).
- Overall sex-age distributions derived from the MPHIA 2015-2016.[2]
- Stratum-level (zonal) population estimates obtained from the 2018 Malawi Population & Housing Preliminary Report.[1]

Selection of the Primary Sampling Units

The first stage MPHIA 2020 sample was selected from a sampling frame of EAs that originally had been created for the 2018 Malawi Population Census that were subsequently updated by NSO. The EAs in the updated sampling frame were generally the same as those created for the 2014 Population Census, except that some EAs were subdivided into separate EAs. The updated sampling frame consisted of slightly over 18,463 EAs containing an estimated 3,978,558 households as of 2019.

A stratified sample of 338 EAs was selected from the sampling frame. The 7 strata specified for sampling were the 7 health zones of Malawi.

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

Details regarding EA segmentation may be found in the MPHIA 2020-2021 Sampling and Weighting Technical Report available on the PHIA Project website.

Selection of Households

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

The selection of households for the MPHIA 2020-2021 involved the following steps: (1) listing the dwelling units/households within the sampled EAs; (2) assigning eligibility codes to the listed dwelling unit/household records; (3) and selecting the samples of dwelling units/households. A description of the household listing process as well as a summary of household eligibility may be found in the MPHIA 2020-2021 Sampling and Weighting Technical Report on the PHIA Project website.

Selection of households utilized an equal probability design. In order to achieve equal probability samples of households within each of the 7 health zones of Malawi, the sampling rates required to select dwelling units/households within an EA depended on the difference between the MOS used in sampling and the actual number of dwelling units/households found at the time of listing. Thus, application of these within-EA sampling rates could have yielded more or less than the desired number of households in EAs where the sampling MOS differs from the actual listing count. The MPHIA 2020-2021 Sampling and Weighting Technical Report provides an in-depth description of the equal probability sample design, as well as a detailed summary of the results of the household selection.

Selection of Individuals

The selection of individuals for the MPHIA 2020-2021 involved compiling a list (the household roster) of all individuals known to reside in the household or who slept in the household during the night prior to data collection. Those who met the eligibility requirements (individuals aged 15 years and older who slept in the household the night before) were offered survey enrollment. Only eligible individuals who were able to provide verbal informed consent/assent to participate in the survey were retained for subsequent weighting and analysis.

The MPHIA 2020-2021 Sampling and Weighting Technical Report provides a brief description of the process for listing and selecting individuals for participation in the MPHIA 2020-2021 and presents detailed summaries of the distributions of eligible individuals and participants in individual interviews and HIV testing by strata and age.

A.2 WEIGHTING

Overview

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

Nonresponse is unavoidable in virtually all surveys of human populations. For MPHIA 2020-2021, nonresponse could have occurred at different stages of data collection, for example, (1) before the enumeration of individuals in the household, (2) after household enumeration and selection of persons, but before completion of the individual interview, and (3) after completion of the interview, but before collection of a viable blood sample.

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

Methods

The overall weighting approach for MPHIA 2020-2021 included several steps. Methods and results for each of the steps below are detailed in the MPHIA 2020-2021 Sampling and Weighting Technical Report.

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

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

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

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

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

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

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

A.3 REFERENCES

1. National Statistical Office (NSO) Malawi. 2018 Malawi Population and Housing: Census Main Report. Lilongwe; NSO Malawi; May 2019.

2. Ministry of Health, Malawi. Malawi Population-Based HIV Impact Assessment (MPHIA) 2015-2016: Final Report. Lilongwe, Ministry of Health. October 2018.

APPENDIX B HIV TESTING METHODOLOGY

B.1 SPECIMEN COLLECTION AND HANDLING

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

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

B.2 HOUSEHOLD-BASED PROCEDURES

HIV Rapid Testing

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

Determine™ HIV-1/2 (Abbott Molecular Inc., Des Plaines, Illinois, United States) was used as a screening test and Uni-Gold™ (Trinity Biotech, plc. Wicklow, Ireland) as a confirmatory test. Individuals with a nonreactive result on the screening test were reported as HIV negative. Individuals with a reactive screening test underwent subsequent testing with Uni-Gold™. Those with reactive results on both the screening and confirmatory tests were classified as HIV positive. Individuals with a reactive Determine™ test followed by a nonreactive Uni-Gold™ test were immediately retested in parallel in the field. If the results during the parallel testing were repeatedly discordant, the individual was classified as inconclusive and referred to a local health facility for repeat testing within 4 weeks as per the national guidelines. Those with an inconclusive or HIV-positive test result were given a field test referral form which provided different instructions to the health facility for inconclusive; positive, not on ART; and positive, on ART.

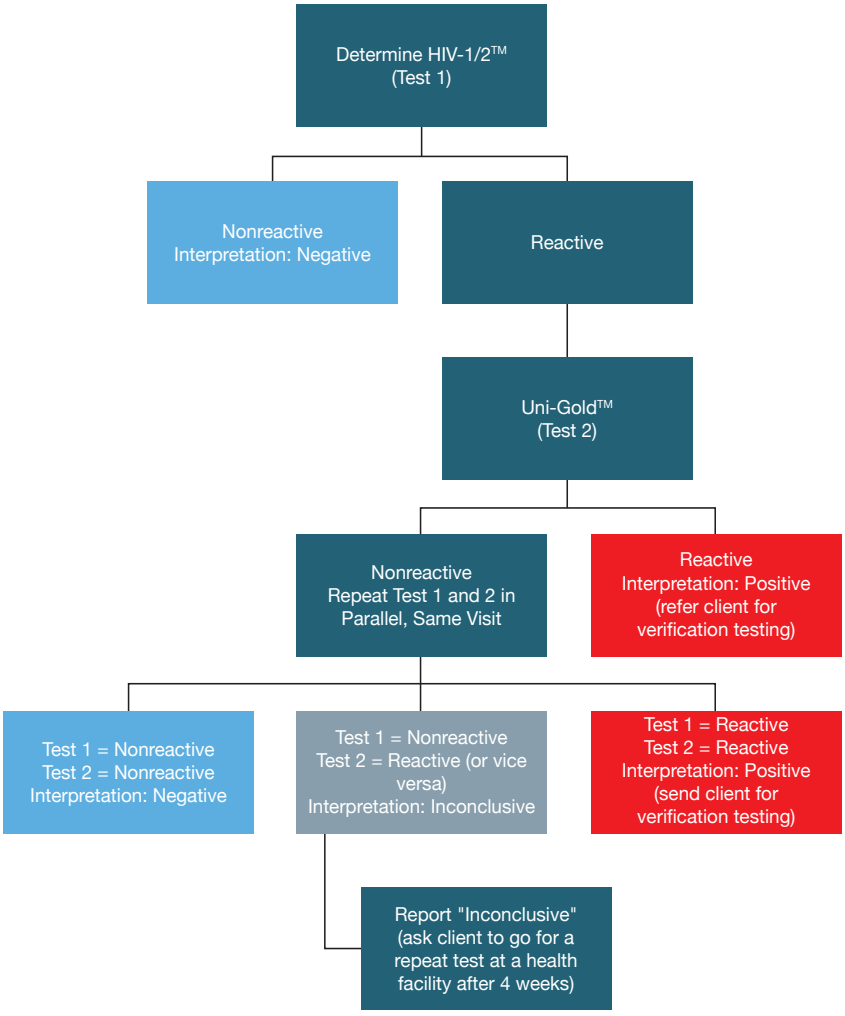

Figure B.1: Household-based HIV testing algorithm, MPHIA 2020-2021

Counseling, Referral to Care, and Active Linkage to Care

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

All participants who consented to HIV testing were to select a referral health facility prior to testing. Those with an HIV-positive test result were referred to HIV care and treatment at the health facility of their choice. Further, HIV-positive participants who were not on ART were asked for their consent to be contacted by qualified healthcare personnel to facilitate active linkage to HIV care and treatment. Those who consented sharing their contact information with a trained healthcare worker or counselor were actively linked to HIV care and treatment services at a health facility of their choice and offered a physical escort to the facility accompanied by a linkage assistant. If an HIV-positive participant provided consent to share contact information and reported not being on ART, the field staff completed the Active Linkage to Care Form. All organizations participating in linkage to care were trained in confidentiality procedures and detailed procedures on active linkage to care, including eligibility for linkage to care, how contact information should be shared with the facility, community-based organization or a local linkage counselor, mechanisms of facilitated linkage, and documentation of linkage to care.

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

Quality Assurance and Control

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

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

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

B.3 LABORATORY-BASED PROCEDURES

Thirteen satellite laboratories for the survey were established nationally. One central reference laboratory was chosen for more specialized tests. At each satellite laboratory, trained technicians performed HIV confirmatory testing, QA testing, and processing of whole blood specimens into plasma aliquots and DBS cards for temporary storage at -20°C.

Geenius Testing

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

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

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

Classification of Final HIV Status

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

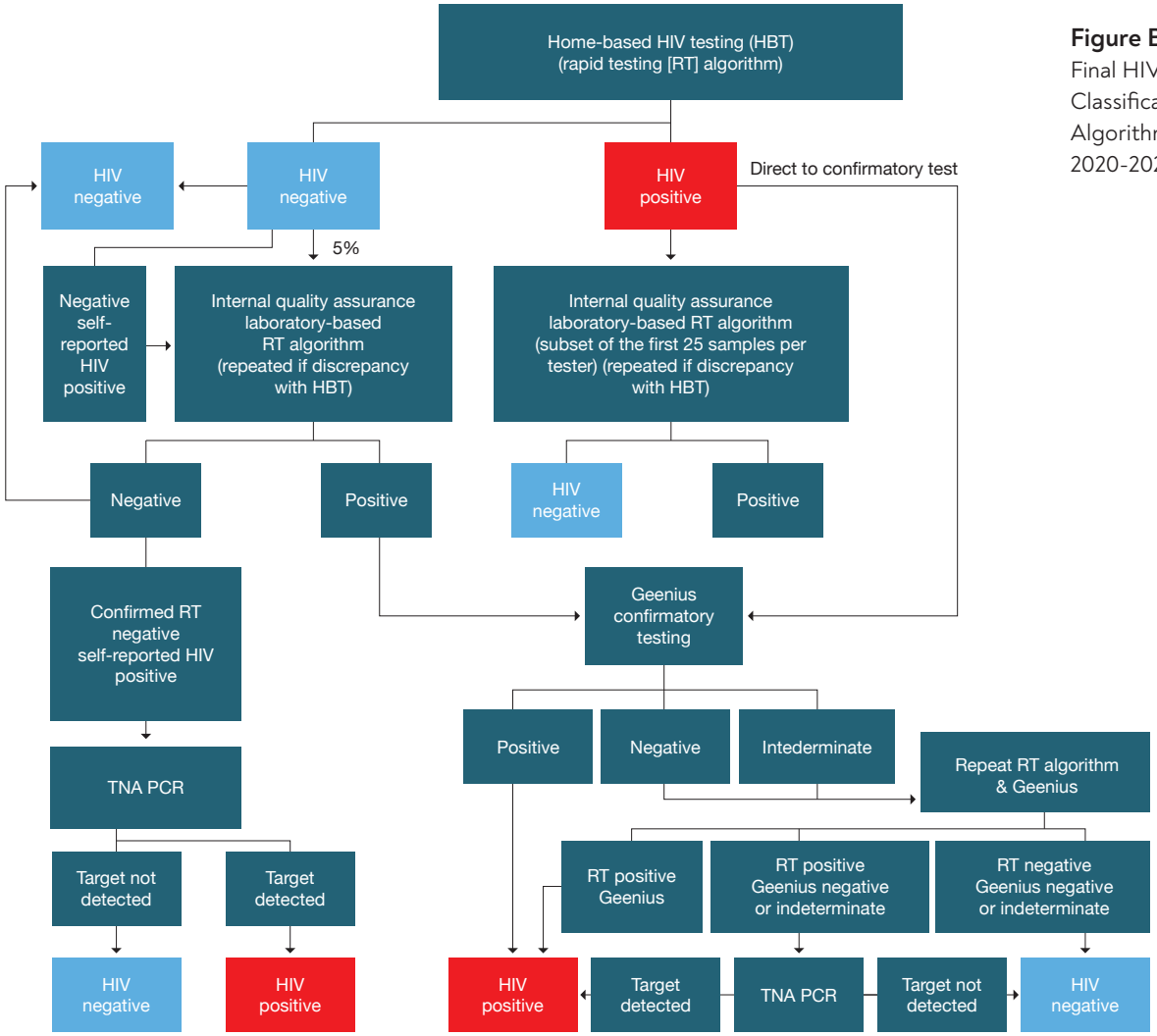

Figure B.2: Final HIV Status Classification Algorithm, MPHIA 2020-2021

Abbreviations: TNA PCR, total nucleic acid polymerase chain reaction.

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

CD4 Count Measurement

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

Viral Load Testing

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

Return of CD4 and Viral Load Results

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

HIV Recency Testing

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

First, viral load results were assessed on all HIV-positive specimens. Those with a viral load < 1,000 copies/mL were classified as long-term infections, while those with a viral load ≥ 1,000 copies/mL were classified as potential recent infections and LAg avidity assessed.

The Sedia HIV-1 LAg-Avidity EIA (Sedia Biosciences Corporation, Portland, Oregon, United States) was used on plasma specimens, while the Maxim HIV-1 Limiting Antigen-Avidity Dried Blood Spot (DBS) EIA (Maxim Biomedical, Bethesda, Maryland, United States) was used on DBS specimens.

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

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

ARV detection data were assessed for the samples with a median ODn ≤ 1.5 for plasma and ODn ≤ 1.0 for DBS. Those with a detectable ARV were classified as long-term infections and those without were classified as recent infections (Figure B.3).

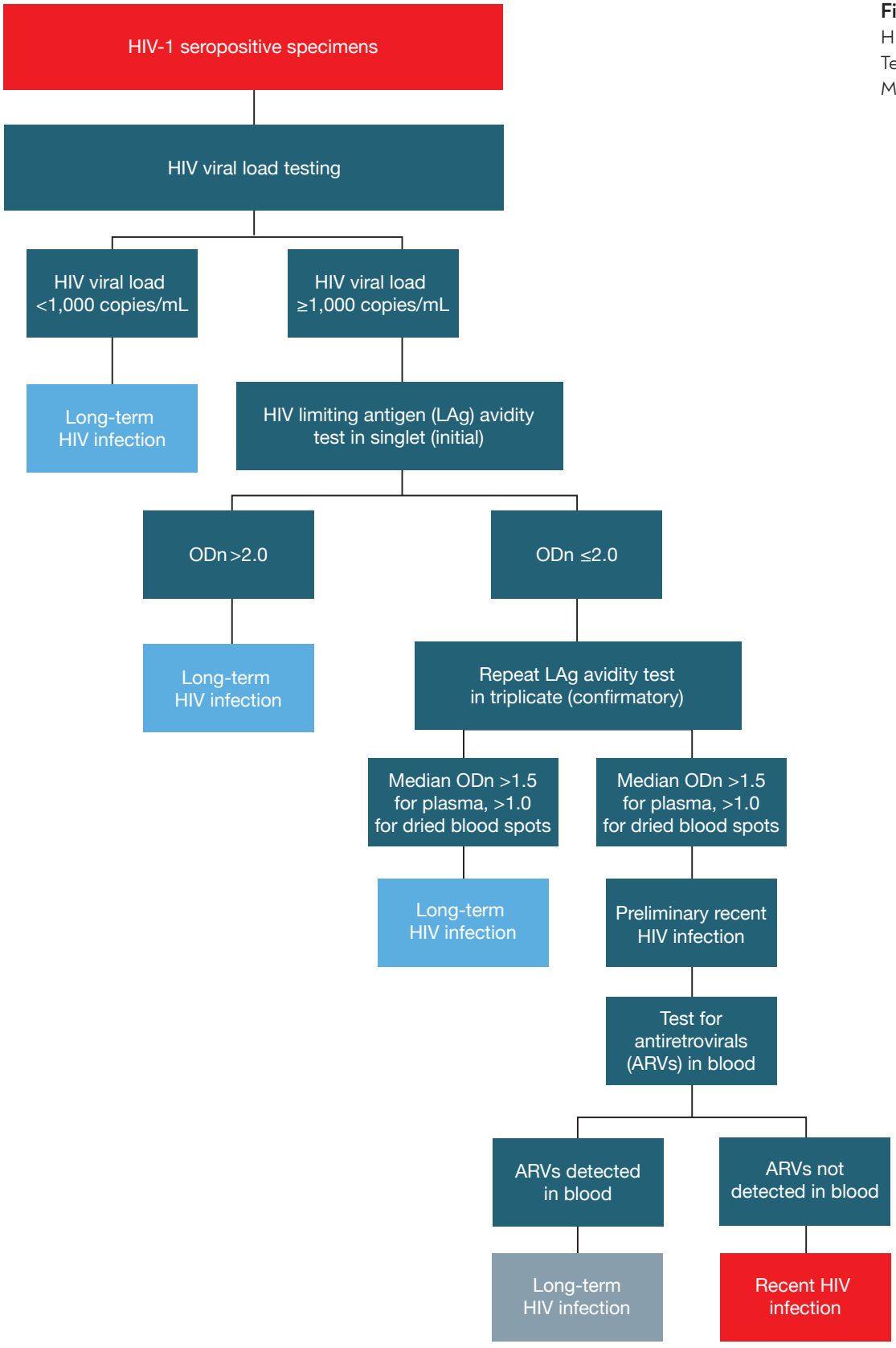

Figure B.3: HIV-1 Recent Infection Testing Algorithm, MPHIA 2020-2021

Abbreviations: mL: milliliter; ODn: normalized optical density; DBS: dried blood spot; ARV: antiretroviral.

HIV Incidence Estimation

Incidence estimates were obtained using the formula recommended by the WHO Incidence Working Group and Consortium for Evaluation and Performance of Incidence Assays. Weighted counts for HIV-negative persons (N); HIV-positive persons (P); numbers tested on the LAg assay (Q); and numbers HIV recent (R) were provided for use in incidence calculations or the UNAIDS Spectrum models (Table B.1). Incidence estimates were calculated using the following parameters: mean duration recent infection = 130 days (95% CI: 118-142 days); proportion false recent = 0.00; time cutoff = 1 year. In-depth details are provided in the MPHIA 2020-2021 Technical Report, which may be found online on the PHIA Project website.

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

Annual incidence of HIV among adults aged 15-49 and 15 years and older, by sex and age, using the recent infection testing algorithm (limiting antigen plus viral load plus antiretroviral biomarker testing), MPHIA 2020-2021

Age	Men			
	Number HIV negative[1] (N)	**Number HIV positive[1] (P)**	**Number tested on LAg assay[1] (Q)**	**Number HIV recent[1] (R)**
15-24	3,365.0	47.0	47.0	0.8
25-34	1,989.7	98.3	98.3	2.7
35-49	2,014.7	331.3	331.3	0.0
50+	1,504.9	244.1	244.1	0.0
15-49	7,392.7	453.3	453.3	3.8
15+	8,914.8	680.2	680.2	3.9
Age	Women			
	Number HIV negative[1] (N)	**Number HIV positive[1] (P)**	**Number tested on LAg assay[1] (Q)**	**Number HIV recent[1] (R)**
15-24	4,089.1	117.9	117.9	6.1
25-34	2,941.2	345.8	344.9	2.6
35-49	2,645.2	700.8	698.5	1.7
50+	1,940.3	286.7	286.7	1.1
15-49	9,757.0	1,083.0	1,080.1	10.8
15+	11,697.3	1,369.7	1,366.8	12.0
Age	Total			
	Number HIV negative[1] (N)	**Number HIV positive[1] (P)**	**Number tested on LAg assay[1] (Q)**	**Number HIV recent[1] (R)**
15-24	7,457.6	161.4	161.4	6.7
25-34	4,957.5	417.5	416.7	5.5
35-49	4,685.1	1,006.9	1,004.8	1.5
50+	3,444.4	531.6	531.6	1.1
15-49	17,194.8	1,491.2	1,488.6	14.1
15+	20,651.2	2,010.8	2,008.2	15.3

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

Detection of Antiretrovirals

Qualitative screening for detectable concentrations of ARVs was conducted on DBS specimens from all HIV-positive participants by means of high-resolution liquid chromatography coupled with tandem mass spectrometry. The method used for ARV detection was a modified version of the methodology described by Koal et al.[1] 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 QC cut-off samples, including negative controls, were utilized in each run.

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

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

Genotyping for Detection of Antiretroviral Drug Resistance and HIV Subtyping

HIV resistance to ARVs was assessed for HIV-positive participants including recent cases, those without VLS (≥1,000 copies/mL; both on treatment and not on treatment), and those with viral load of 200-999 copies/mL. The findings will be presented in a separate addendum to this report.

B.4 REFERENCES

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

APPENDIX C ESTIMATES OF SAMPLING ERRORS

Estimates from sample surveys are affected by two types of errors: nonsampling errors and sampling errors. Nonsampling errors result from mistakes made during data collection (eg, misinterpretation of an HIV test result) and data management (eg, transcription errors in data entry). While MPHIA 2020-2021 implemented numerous QA and QC measures to minimize nonsampling errors, these errors are impossible to avoid and difficult to evaluate statistically.

In contrast, sampling errors can be evaluated statistically. The sample of respondents selected for MPHIA 2020-2021 is only one of many samples that could have been selected from the same population, using the same design and expected size. Each of these samples would yield results that differ somewhat from the results of the actual sample selected. Sampling errors are a measure of the variability between all possible samples. Although the degree of variability is not known exactly, it can be estimated from the survey results.

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

MPHIA 2020-2021 utilized a multistage stratified sample design, which required complex calculations to obtain sampling errors. Specifically, a variant of the jackknife replication method was implemented in SAS to estimate variance for proportions (eg, HIV prevalence), rates (eg, annual HIV incidence), and counts (eg, numbers of people living with HIV). Each replication considered all but one cluster in the calculation of the estimates. Pseudo-independent replications were thus created. In MPHIA 2020-2021, a jackknife replicate was created by randomly deleting one cluster from each variance-estimation stratum and retaining all of the clusters in the remaining strata. A total of 338 variance-estimation strata were created by pairing (or occasionally tripling) the sample clusters in the systematic order in which they had been selected. Hence, 338 replications were created. The variance of a sample-based statistic, y, was 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 was also calculated. The design effect is defined as the ratio of the variance using the given sample design to the variance that would result if a simple random sample had been used. A design effect of 1.0 indicates that the sample design is as efficient as a simple random sample, while a value greater than 1.0 indicates the increase in the variance due to the use of a more complex and less statistically efficient design. Confidence limits for the estimates, which are calculated as

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

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

Sampling errors for selected variables from the MPHIA 2020-2021 are presented in tables C.1 through C.8, and sampling errors for all survey estimates may be found online on the PHIA website. For each variable, sampling error tables include the weighted estimate, unweighted denominator, standard error, design effect, and lower and upper 95% confidence limits.

Table C.1 Sampling errors: Annual HIV incidence by age, MPHIA 2020-2021

Age (years)	Weighted estimate (%)	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
			Men			
15-24	0.07	0.08	0.85	1.08	0.00	0.22
25-34	0.38	0.27	1.44	0.72	0.00	0.91
35-49	0.00	0.00	0.00	0.00	0.00	0.51
50+	0.00	0.00	0.00	0.00	0.00	0.69
15-49	0.15	0.09	1.44	0.61	0.00	0.32
15+	0.12	0.08	1.48	0.61	0.00	0.27
			Women			
15-24	0.42	0.17	0.85	0.39	0.09	0.75
25-34	0.25	0.15	0.88	0.62	0.00	0.55
35-49	0.18	0.14	0.86	0.77	0.00	0.45
50+	0.16	0.16	1.13	1.00	0.00	0.48
15-49	0.31	0.10	0.90	0.31	0.13	0.50
15+	0.29	0.08	0.92	0.29	0.12	0.45
			Total			
15-24	0.25	0.10	0.81	0.38	0.06	0.44
25-34	0.31	0.15	1.35	0.50	0.01	0.61
35-49	0.09	0.07	0.76	0.81	0.00	0.24
50+	0.09	0.09	1.09	1.00	0.00	0.26
15-49	0.23	0.06	1.06	0.28	0.11	0.36
15+	0.21	0.06	1.06	0.27	0.10	0.32

Note that the Clopper Pearson method was used to calculate upper limit for cells with no recent infections.

Table C.2 Sampling errors: HIV prevalence by age, MPHIA 2020-2021

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
				Men			
15-19	1.4	1,830	0.3	1.0	0.2	0.9	2.0
20-24	1.3	1,582	0.3	1.2	0.2	0.7	2.0
25-29	3.2	1,131	0.6	1.4	0.2	2.0	4.5
30-34	6.5	957	0.8	0.9	0.1	4.9	8.1
35-39	9.4	904	1.0	1.1	0.1	7.3	11.4
40-44	15.7	777	1.5	1.2	0.1	12.7	18.7
45-49	19.4	665	1.6	1.1	0.1	16.2	22.7
50-54	20.0	461	1.9	1.1	0.1	16.1	24.0
55-59	17.5	349	2.2	1.2	0.1	12.9	22.1
60-64	13.2	297	2.0	1.0	0.2	9.1	17.3
65+	7.0	642	1.1	1.1	0.2	4.8	9.2

Table C.2 Sampling errors: HIV prevalence by age, MPHIA 2020-2021 (continued)

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
Total 15-24	1.4	3,412	0.2	1.1	0.2	1.0	1.8
Total 15-49	5.8	7,846	0.3	1.2	0.1	5.2	6.4
Total 50+	14.0	1,749	0.9	1.2	0.1	12.1	15.8
Total 15+	7.1	9,595	0.3	1.3	0.0	6.5	7.7
			Women				
15-19	1.7	1,942	0.3	0.9	0.2	1.2	2.3
20-24	4.0	2,265	0.4	0.9	0.1	3.2	4.9
25-29	7.6	1,846	0.6	0.9	0.1	6.4	8.8
30-34	14.1	1,441	0.9	1.0	0.1	12.1	16.0
35-39	20.0	1,451	1.0	0.9	0.1	18.0	22.1
40-44	21.2	1,045	1.3	1.1	0.1	18.5	23.9
45-49	22.1	850	1.6	1.3	0.1	18.8	25.4
50-54	20.6	562	1.8	1.1	0.1	16.9	24.3
55-59	12.6	445	1.5	0.9	0.1	9.5	15.8
60-64	11.5	408	1.5	0.9	0.1	8.4	14.5
65+	8.5	812	1.1	1.2	0.1	6.2	10.7
Total 15-24	2.8	4,207	0.2	0.8	0.1	2.3	3.3
Total 15-49	10.0	10,840	0.3	1.0	0.0	9.4	10.6
Total 50+	12.9	2,227	0.7	1.1	0.1	11.3	14.4
Total 15+	10.5	13,067	0.3	1.1	0.0	9.9	11.1
			Total				
15-19	1.6	3,772	0.2	0.8	0.1	1.2	2.0
20-24	2.7	3,847	0.3	1.0	0.1	2.2	3.3
25-29	5.5	2,977	0.4	1.1	0.1	4.6	6.4
30-34	10.5	2,398	0.6	1.0	0.1	9.2	11.8
35-39	15.0	2,355	0.7	1.0	0.0	13.5	16.5
40-44	18.5	1,822	1.1	1.5	0.1	16.3	20.8
45-49	20.8	1,515	1.2	1.4	0.1	18.3	23.3
50-54	20.3	1,023	1.3	1.1	0.1	17.6	23.1
55-59	15.0	794	1.4	1.2	0.1	12.2	17.8
60-64	12.3	705	1.2	1.0	0.1	9.8	14.8
65+	7.9	1,454	0.8	1.3	0.1	6.2	9.5
Total 15-24	2.1	7,619	0.2	1.0	0.1	1.8	2.5
Total 15-49	8.0	18,686	0.2	1.5	0.0	7.5	8.5
Total 50+	13.4	3,976	0.6	1.3	0.0	12.1	14.6
Total 15+	8.9	22,662	0.2	1.6	0.0	8.4	9.4

Table C.3 Sampling errors: HIV prevalence by residence and district among adults aged 15 years and older, MPHIA 2020-2021

Characteristic	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
			Men				
Residence							
Urban	10.45	1,701	0.86	1.34	0.08	8.68	12.22
Rural	6.36	7,894	0.32	1.33	0.05	5.71	7.01
Zone							
North	5.89	1,201	0.87	1.65	0.15	4.09	7.69
Central-East	3.06	1,761	0.48	1.38	0.16	2.06	4.05
Central-West	3.95	1,378	0.59	1.27	0.15	2.73	5.16
Lilongwe City	9.99	495	1.20	0.79	0.12	7.52	12.46
South-East	9.00	2,044	0.70	1.24	0.08	7.55	10.45
South-West	11.51	2,127	0.88	1.60	0.08	9.71	13.32
Blantyre City	11.28	589	1.25	0.92	0.11	8.70	13.85
			Women				
Residence							
Urban	13.71	2,295	0.69	0.92	0.05	12.29	15.13
Rural	9.80	10,772	0.31	1.16	0.03	9.17	10.44
Zone							
North	7.35	1,363	0.68	0.93	0.09	5.94	8.76
Central-East	5.00	2,090	0.51	1.15	0.10	3.94	6.05
Central-West	5.22	1,727	0.48	0.80	0.09	4.24	6.21
Lilongwe City	11.13	741	1.07	0.86	0.10	8.93	13.34
South-East	13.96	3,315	0.65	1.15	0.05	12.63	15.29
South-West	16.40	3,120	0.80	1.45	0.05	14.75	18.05
Blantyre City	17.14	711	1.49	1.11	0.09	14.07	20.20
			Total				
Residence							
Urban	12.14	3,996	0.62	1.43	0.05	10.87	13.42
Rural	8.17	18,666	0.26	1.73	0.03	7.63	8.72
Zone							
North	6.60	2,564	0.63	1.66	0.10	5.30	7.91
Central-East	4.01	3,851	0.41	1.69	0.10	3.16	4.86
Central-West	4.61	3,105	0.41	1.18	0.09	3.77	5.45
Lilongwe City	10.62	1,236	0.97	1.23	0.09	8.61	12.62
South-East	11.80	5,359	0.56	1.59	0.05	10.65	12.94
South-West	14.19	5,247	0.70	2.14	0.05	12.74	15.64
Blantyre City	14.25	1,300	0.91	0.87	0.06	12.38	16.11

Table C.4 Sampling errors: Viral load suppression by age, MPHIA 2020-2021

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
			Men				
15-19	(79.42)	28	6.34	0.66	0.08	66.36	92.49
20-24	(69.16)	23	9.20	0.87	0.13	50.21	88.12
25-29	(73.85)	37	6.82	0.87	0.09	59.80	87.90
30-34	74.03	68	5.43	1.03	0.07	62.85	85.21
35-39	81.57	87	4.30	1.06	0.05	72.71	90.43
40-44	89.49	132	2.89	1.16	0.03	83.54	95.44
45-49	90.25	141	2.67	1.14	0.03	84.74	95.76
50-54	93.46	98	2.76	1.21	0.03	87.77	99.14
55-59	89.90	64	4.08	1.15	0.05	81.51	98.30
60-64	(81.97)	45	5.84	1.02	0.07	69.94	94.00
65+	(94.69)	45	3.07	0.82	0.03	88.37	100.00
15-24	74.98	51	5.68	0.86	0.08	63.28	86.68
25-34	73.96	105	4.36	1.03	0.06	64.98	82.95
35-44	86.14	219	2.35	1.01	0.03	81.30	90.98
45-54	91.66	239	1.92	1.15	0.02	87.70	95.63
55-64	87.00	109	3.39	1.10	0.04	80.01	94.00
Total 15-49	83.01	516	1.72	1.07	0.02	79.47	86.54
Total 50+	90.95	252	1.91	1.12	0.02	87.01	94.89
Total 15+	85.52	768	1.27	1.00	0.01	82.89	88.14
			Women				
15-19	(74.48)	42	8.16	1.44	0.11	57.66	91.29
20-24	72.55	108	4.47	1.07	0.06	63.35	81.75
25-29	72.92	166	3.41	0.97	0.05	65.89	79.95
30-34	89.01	235	2.34	1.31	0.03	84.20	93.82
35-39	90.61	330	1.77	1.22	0.02	86.95	94.26
40-44	92.36	255	1.84	1.22	0.02	88.57	96.15
45-49	96.14	219	1.28	0.97	0.01	93.50	98.78
50-54	95.50	132	1.79	0.97	0.02	91.82	99.17
55-59	88.60	71	4.06	1.14	0.05	80.23	96.96
60-64	95.70	56	3.09	1.28	0.03	89.33	100.00
65+	90.76	79	3.15	0.92	0.03	84.27	97.26
15-24	73.20	150	4.04	1.24	0.06	64.89	81.51
25-34	82.59	401	2.08	1.20	0.03	78.31	86.87
35-44	91.41	585	1.22	1.11	0.01	88.89	93.92
45-54	95.87	351	1.11	1.10	0.01	93.58	98.17
55-64	91.59	127	2.73	1.22	0.03	85.97	97.20
Total 15-49	87.12	1,355	1.01	1.22	0.01	85.05	89.19
Total 50+	92.98	338	1.33	0.92	0.01	90.24	95.73
Total 15+	88.35	1,693	0.86	1.20	0.01	86.59	90.11

Table C.4 Sampling errors: Viral load suppression by age, MPHIA 2020-2021 (continued)

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
			Total				
15-19	76.62	70	5.27	1.07	0.07	65.77	87.47
20-24	71.78	131	4.22	1.14	0.06	63.09	80.48
25-29	73.18	203	3.11	1.00	0.04	66.76	79.59
30-34	84.60	303	2.36	1.29	0.03	79.75	89.45
35-39	87.94	417	1.87	1.36	0.02	84.10	91.78
40-44	91.20	387	1.75	1.47	0.02	87.60	94.80
45-49	93.48	360	1.52	1.36	0.02	90.34	96.61
50-54	94.53	230	1.45	0.93	0.02	91.54	97.51
55-59	89.33	135	3.10	1.35	0.03	82.94	95.71
60-64	88.80	101	3.30	1.10	0.04	81.99	95.60
65+	92.26	124	2.23	0.86	0.02	87.66	96.86
15-24	73.75	201	3.29	1.12	0.04	66.97	80.54
25-34	80.11	506	1.99	1.26	0.02	76.00	84.21
35-44	89.56	804	1.24	1.33	0.01	87.00	92.13
45-54	93.93	590	1.09	1.22	0.01	91.69	96.16
55-64	89.12	236	2.38	1.37	0.03	84.22	94.03
Total 15-49	85.70	1,871	0.93	1.32	0.01	83.78	87.62
Total 50+	92.01	590	1.14	1.04	0.01	89.67	94.35
Total 15+	87.27	2,461	0.75	1.25	0.01	85.73	88.82

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

Table C.5 Sampling errors: Viral load suppression among adults aged 15 years and older by residence and district, MPHIA 2020-2021

Characteristic	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
			Men				
Residence							
Urban	79.63	185	2.57	0.75	0.03	74.34	84.92
Rural	87.61	583	1.43	1.10	0.02	84.67	90.56
Zone							
North	86.22	71	4.38	1.13	0.05	77.20	95.24
Central-East	82.23	59	4.29	0.73	0.05	73.39	91.07
Central-West	85.93	59	4.11	0.81	0.05	77.46	94.41
Lilongwe City	81.79	50	4.07	0.54	0.05	73.41	90.16
South-East	87.66	199	2.18	0.87	0.02	83.18	92.14
South-West	87.93	261	2.10	1.08	0.02	83.60	92.25
Blantyre City	76.46	69	5.23	1.03	0.07	65.69	87.24

Table C.5 Sampling errors: Viral load suppression among adults aged 15 years and older by residence and district, MPHIA 2020-2021 (continued)

Characteristic	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
			Women				
Residence							
Urban	82.59	373	2.17	1.22	0.03	78.13	87.05
Rural	90.03	1,320	0.87	1.12	0.01	88.24	91.83
Zone							
North	86.15	112	3.26	0.99	0.04	79.45	92.86
Central-East	88.83	112	3.36	1.27	0.04	81.90	95.76
Central-West	91.36	109	2.68	0.98	0.03	85.83	96.88
Lilongwe City	76.52	103	5.08	1.46	0.07	66.06	86.98
South-East	89.93	514	1.37	1.06	0.02	87.11	92.74
South-West	89.86	598	1.47	1.41	0.02	86.84	92.88
Blantyre City	83.98	145	3.08	1.01	0.04	77.64	90.32
			Total				
Residence							
Urban	81.36	558	1.69	1.05	0.02	77.87	84.85
Rural	89.14	1,903	0.80	1.26	0.01	87.49	90.79
Zone							
North	86.19	183	2.55	1.00	0.03	80.93	91.44
Central-East	86.25	171	2.71	1.05	0.03	80.67	91.83
Central-West	89.13	168	2.30	0.91	0.03	84.39	93.86
Lilongwe City	78.79	153	3.60	1.18	0.05	71.38	86.20
South-East	89.17	713	1.32	1.28	0.01	86.46	91.89
South-West	89.15	859	1.31	1.53	0.01	86.45	91.86
Blantyre City	81.04	214	2.84	1.12	0.04	75.19	86.90

Table C.6 Sampling errors: ARV-adjusted 90-90-90 by age (conditional percentages), MPHIA 2020-2021

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
			Men				
			Diagnosed				
15-24	77.17	51	5.37	0.82	0.07	66.11	88.23
25-34	69.53	105	5.18	1.32	0.07	58.85	80.20
35-49	88.79	360	1.74	1.09	0.02	85.22	92.37
50+	89.54	252	2.32	1.44	0.03	84.77	94.31
15-49	82.91	516	1.81	1.19	0.02	79.18	86.64
15+	85.00	768	1.49	1.34	0.02	81.93	88.08
			On Treatment				
15-24	(95.36)	38	3.15	0.83	0.03	88.86	100.00
25-34	95.05	73	2.79	1.19	0.03	89.32	100.00

Table C.6 Sampling errors: ARV-adjusted 90-90-90 by age (conditional percentages), MPHIA 2020-2021 (continued)

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
35-49	97.84	322	0.99	1.48	0.01	95.81	99.87
50+	98.18	229	0.91	1.05	0.01	96.32	100.00
15-49	97.03	433	0.94	1.32	0.01	95.11	98.96
15+	97.42	662	0.69	1.24	0.01	96.00	98.83
Viral Load Suppression							
15-24	(90.62)	36	4.20	0.72	0.05	81.97	99.26
25-34	95.38	70	2.53	1.01	0.03	90.16	100.00
35-49	97.70	317	0.85	1.01	0.01	95.95	99.45
50+	97.15	225	1.04	0.88	0.01	95.00	99.29
15-49	96.57	423	0.89	1.01	0.01	94.73	98.40
15+	96.76	648	0.69	0.98	0.01	95.34	98.18
Women							
Diagnosed							
15-24	75.80	150	4.02	1.31	0.05	67.52	84.08
25-34	85.62	401	1.84	1.09	0.02	81.84	89.40
35-49	94.92	804	0.81	1.09	0.01	93.26	96.58
50+	93.18	338	1.54	1.25	0.02	90.02	96.35
15-49	89.65	1,355	0.96	1.34	0.01	87.67	91.62
15+	90.39	1,693	0.88	1.52	0.01	88.57	92.21
On Treatment							
15-24	96.21	115	1.90	1.13	0.02	92.30	100.00
25-34	96.92	347	0.94	1.02	0.01	94.99	98.86
35-49	98.67	766	0.46	1.26	0.00	97.71	99.63
50+	99.18	318	0.48	0.89	0.00	98.20	100.00
15-49	97.89	1,228	0.44	1.15	0.00	96.98	98.80
15+	98.17	1,546	0.36	1.13	0.00	97.42	98.91
Viral Load Suppression							
15-24	90.71	111	3.13	1.28	0.03	84.26	97.15
25-34	95.56	336	1.17	1.07	0.01	93.16	97.96
35-49	97.98	757	0.58	1.31	0.01	96.78	99.19
50+	98.42	315	0.70	1.00	0.01	96.98	99.87
15-49	96.52	1,204	0.64	1.46	0.01	95.21	97.83
15+	96.94	1,519	0.50	1.28	0.01	95.90	97.97
Total							
Diagnosed							
15-24	76.23	201	3.34	1.23	0.04	69.34	83.11
25-34	80.99	506	2.19	1.58	0.03	76.47	85.51
35-49	92.58	1,164	0.87	1.28	0.01	90.79	94.38
50+	91.44	590	1.46	1.59	0.02	88.44	94.44
15-49	87.31	1,871	0.96	1.54	0.01	85.35	89.28
15+	88.35	2,461	0.83	1.63	0.01	86.64	90.05
On Treatment							
15-24	95.94	153	1.64	1.06	0.02	92.56	99.33
25-34	96.46	420	0.99	1.20	0.01	94.43	98.50

Table C.6 Sampling errors: ARV-adjusted 90-90-90 by age (conditional percentages), MPHIA 2020-2021 (continued)

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
35-49	98.37	1,088	0.47	1.48	0.00	97.41	99.33
50+	98.71	547	0.49	1.05	0.01	97.70	99.73
15-49	97.61	1,661	0.41	1.20	0.00	96.76	98.45
15+	97.89	2,208	0.33	1.15	0.00	97.22	98.57
Viral Load Suppression							
15-24	90.68	147	2.61	1.18	0.03	85.31	96.05
25-34	95.52	406	1.09	1.12	0.01	93.27	97.76
35-49	97.88	1,074	0.49	1.26	0.01	96.86	98.89
50+	97.83	540	0.64	1.05	0.01	96.50	99.16
15-49	96.54	1,627	0.54	1.41	0.01	95.43	97.64
15+	96.87	2,167	0.43	1.31	0.00	95.99	97.76

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

Table C.7 Sampling errors: ARV-adjusted 90-90-90 by age (overall percentages), MPHIA 2020-2021

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
Men							
Diagnosed							
15-24	77.2	51	5.4	0.8	0.1	66.1	88.2
25-34	69.5	105	5.2	1.3	0.1	58.9	80.2
35-49	88.8	360	1.7	1.1	0.0	85.2	92.4
50+	89.5	252	2.3	1.4	0.0	84.8	94.3
15-49	82.9	516	1.8	1.2	0.0	79.2	86.6
15+	85.0	768	1.5	1.3	0.0	81.9	88.1
On Treatment							
15-24	73.6	51	5.7	0.8	0.1	61.8	85.4
25-34	66.1	105	5.2	1.3	0.1	55.3	76.8
35-49	86.9	360	1.9	1.1	0.0	83.0	90.7
50+	87.9	252	2.5	1.5	0.0	82.8	93.0
15-49	80.4	516	1.9	1.1	0.0	76.6	84.3
15+	82.8	768	1.5	1.3	0.0	79.6	86.0
Viral Load Suppression							
15-24	66.7	51	6.5	0.9	0.1	53.3	80.1
25-34	63.0	105	5.2	1.2	0.1	52.2	73.8
35-49	84.9	360	2.0	1.1	0.0	80.8	88.9
50+	85.4	252	2.6	1.4	0.0	80.1	90.8
15-49	77.7	516	2.0	1.2	0.0	73.6	81.7
15+	80.1	768	1.6	1.2	0.0	76.9	83.4

Table C.7 Sampling errors: ARV-adjusted 90-90-90 by age (overall percentages), MPHIA 2020-2021 (continued)

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Design effect	Relative standard error	Lower confidence limit (%)	Upper confidence limit (%)
			Women				
			Diagnosed				
15-24	75.8	150	4.0	1.3	0.1	67.5	84.1
25-34	85.6	401	1.8	1.1	0.0	81.8	89.4
35-49	94.9	804	0.8	1.1	0.0	93.3	96.6
50+	93.2	338	1.5	1.3	0.0	90.0	96.3
15-49	89.6	1,355	1.0	1.3	0.0	87.7	91.6
15+	90.4	1,693	0.9	1.5	0.0	88.6	92.2
			On Treatment				
15-24	72.9	150	4.2	1.3	0.1	64.3	81.6
25-34	83.0	401	1.9	1.1	0.0	79.0	87.0
35-49	93.7	804	0.9	1.1	0.0	91.8	95.5
50+	92.4	338	1.6	1.2	0.0	89.2	95.7
15-49	87.8	1,355	1.0	1.2	0.0	85.7	89.8
15+	88.7	1,693	0.9	1.4	0.0	86.9	90.6
			Viral Load Suppression				
15-24	66.2	150	4.4	1.3	0.1	57.2	75.1
25-34	79.3	401	2.3	1.2	0.0	74.7	83.9
35-49	91.8	804	1.0	1.1	0.0	89.6	93.9
50+	91.0	338	1.6	1.1	0.0	87.6	94.3
15-49	84.7	1,355	1.1	1.3	0.0	82.4	87.0
15+	86.0	1,693	1.0	1.4	0.0	84.0	88.0
			Total				
			Diagnosed				
15-24	76.2	201	3.3	1.2	0.0	69.3	83.1
25-34	81.0	506	2.2	1.6	0.0	76.5	85.5
35-49	92.6	1,164	0.9	1.3	0.0	90.8	94.4
50+	91.4	590	1.5	1.6	0.0	88.4	94.4
15-49	87.3	1,871	1.0	1.5	0.0	85.3	89.3
15+	88.3	2,461	0.8	1.6	0.0	86.6	90.0
			On Treatment				
15-24	73.1	201	3.5	1.2	0.0	66.0	80.3
25-34	78.1	506	2.2	1.5	0.0	73.6	82.7
35-49	91.1	1,164	1.0	1.4	0.0	89.1	93.1
50+	90.3	590	1.5	1.6	0.0	87.1	93.4
15-49	85.2	1,871	1.0	1.5	0.0	83.2	87.3
15+	86.5	2,461	0.9	1.6	0.0	84.7	88.3
			Viral Load Suppression				
15-24	66.3	201	3.6	1.1	0.1	59.0	73.7
25-34	74.6	506	2.4	1.5	0.0	69.7	79.5
35-49	89.1	1,164	1.1	1.3	0.0	87.0	91.3
50+	88.3	590	1.6	1.4	0.0	85.1	91.5
15-49	82.3	1,871	1.1	1.5	0.0	80.0	84.5
15+	83.8	2,461	0.9	1.5	0.0	81.9	85.7

Table C.8 Sampling errors: Number of new infections annually and number of people living with HIV by age, MPHIA 2020-2021

Age (years)	Weighted estimate	Standard error	Design effect	Relative standard error	Lower confidence limit	Upper confidence limit
Number of new infections annually						
15-24	9,473	3506.0	2.57	0.37	2,238	16,707
25-34	7,630	3625.5	3.41	0.48	149	15,111
35-49	1,778	861.46	0.97	0.48	0	4,620
50+	1,364	661.14	0.71	0.48	0	4,040
15-49	18,898	5008.9	2.73	0.27	8,562	29,234
15+	20,257	5164.1	2.74	0.25	9,601	30,913
People living with HIV						
15-24	81,381	6297.4	0.99	0.08	68,412	94,351
25-34	207,571	10399	1.14	0.05	186,152	228,989
35-49	420,752	14941	1.54	0.04	389,980	451,524
50+	236,093	10954	1.32	0.05	213,532	258,654
15-49	709,704	21708	1.52	0.03	664,996	754,412
15+	945,797	25744	1.63	0.03	892,777	998,818

APPENDIX D SURVEY PERSONNEL

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Lexson Kaere
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Priscilla Bandawe
Richard Mmanga
Sungani Zidana Ndovi
Tesha Kamwendo
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Duncan Chege
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Linda Bisika
Linda Chisi
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Clive Nyanda
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George Shaba
Glory Kambwiri
Harry Joseph
Hope Kalichero
Judith Mlenje Mkandawire
Juliet Nyasulu
Kwapi Mdeza
Lucky Kambalametole
Lucy Mbewe
Lyona Chimwemwe Kaluwa
Madalitso Muhemeri
Magret Tigone
Maria Kamwani
Mary Nankhonya
Mary Sungeni Nandolo
Masozi Chizala
Memory Ntalika
Mphatso Mpinganjira
Nancy K Kamwendo
Nathan Singano
Nedson Gundo
Noreen Ng'ambi
Precious Dzowa
Rachel Veruwa
Rector Chithagala
Ruth Matumbo
Samantha Mkochi
Samuel Mphatso Bvalani
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Bernadetta Chiwanda
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Charles Midima
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Chikweza Darlington
Chiletso Nkomba
Chimwemwe Stuart
Chisomo Leo
Chiyamiko Kandodo
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Clyton Phiri
Constantine Phiri
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Dalitso Fortune Phiri
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Happiness Kanyamula
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Hlupekile Nyasulu
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Madalitso James
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Marina Makuluni
Marvellous Gunde
Mary Kaponya
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Molly Folloma
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Moses Lihaka
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Ruth Mapemba
Ruth Chikaonda
Seko Chisuo
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Timvenji Marley
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Victoria Kaliwo
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Bright Moyo
Byson Mtike
Chikondi Fatsani
Chimodzi Katengeza
Clyton Major
Daff Fortune Juma
David Kaonga
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Dyton Emmanuel
Elias Mkandawire
Elliot Zenengeya
Emmanuel Makhuluzo
Enerst Banda
Enock Biwi
Evans Phiri
Fletcher Guzani
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Fredrick Mwale
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Gelard Bokolo
Geofrey Goka
Gift Makwenda
Gotani Gondwe
Hailey Ng'oma
Haward Kanyamula
Hendreson Chibila
Hendreson Mkandira
Henry M. Kumchulesi
Hussein Bwanali
iIklem Phiri
Innocent Ink
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Jackson Maston
James Mkandawire
James Tengani
Joel Banda
Joel MalitoweJohn Mainga
Jonathan Domoya
Jones Kwatsalayani
Joseph Nawanga
Junior Dinesh Parmer
Kenneth Chunga
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Lameck Phiri
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Leyman Kachiwala
Macdonald Chinkhata
Macdonald Lemani
Macdonald P. Mbizi
Macdonald Sitima
Macmillan Chidandale
Mathews Chisui
Max Mpando
Miles Inkie
Moses Kalungwe
Movet Banda
Moyenda Thomas
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Omar Kamu
Onnious Mhango
Oscar Kafumba
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Peter Mlenga
Raphael Chizeze
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Richard Chamba
Richard Chimphamba
Richard Kachomo
Rodgers Mkokamasa
Rodgers Thom
Saiwa Kaligwegwere
Simplex Chirwa
Steve Mbendera
Steve Sambo
Steward Kachembwe
Sunganani Bakali
Takil James
Watson Chamgwera
Watson Chasweka
Wesley Tenthani
Wilfred Kadowaire
William Kafatiya
Yohane Gift Malango

APPENDIX E HOUSEHOLD QUESTIONNAIRE

HOUSEHOLD SCHEDULE

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

HOUSEHOLD SCHEDULE (continued)

CODES FOR COLUMN 3: RELATIONSHIP TO HOUSEHOLD HEAD

01 = HEAD
02 = WIFE/HUSBAND/PARTNER
03 = SON OR DAUGHTER
04 = SON-IN-LAW/DAUGHTER-IN-LAW
05 = GRANDCHILD
06 = PARENT
07 = PARENT-IN-LAW
08 = BROTHER/SISTER
09 = CO-WIFE
10 = OTHER RELATIVE
11 = ADOPTED/FOSTER/STEPCHILD
12 = NOT RELATED
-8 = DON'T KNOW

LINE NO.	IF AGED 15-17 YEARS EMANCIPATION STATUS	LAST TIME USUAL RESIDENT SLEPT IN HOUSEHOLD		LIVES AWAY	COUNTRY OR PROVINCE	SICK PERSON
	Is (**NAME**) emancipated? Emancipated minors may include those that society may regard as mature minors by law, or those legally married who are aged between 15-17 years and/or are free from any legally competent representative as defined by law in Malawi.	CHECK COLUMN 6, IF NO, when was the last time, (**NAME**) slept the night in the household?				
		MONTH (SEE CODES BELOW)	YEAR	Is (**NAME**) in another district or country?	Which district or country is (**NAME**) in currently? (SEE CODES BELOW)	Has (**NAME**) been very sick for at least 3 months during the past 12 months, that is (**NAME**) was too sick to work or do normal activities?
(1)	(9)	(10)		(11)	(12)	(13)
1	Y N		____ DK = -8 REFUSED = -9	Y N		Y N
2	Y N		____ DK = -8 REFUSED = -9	Y N		Y N
3	Y N		____ DK = -8 REFUSED = -9	Y N		Y N
4	Y N		____ DK = -8 REFUSED = -9	Y N		Y N
5	Y N		____ DK = -8 REFUSED = -9	Y N		Y N
6	Y N		____ DK = -8 REFUSED = -9	Y N		Y N
7	Y N		____ DK = -8 REFUSED = -9	Y N		Y N
8	Y N		____ DK = -8 REFUSED = -9	Y N		Y N

HOUSEHOLD SCHEDULE (continued)

LINE NO.	IF AGED 15-17 YEARS EMANCIPATION STATUS	LAST TIME USUAL RESIDENT SLEPT IN HOUSEHOLD		LIVES AWAY	COUNTRY OR PROVINCE	SICK PERSON
	Is (**NAME**) emancipated? Emancipated minors may include those that society may regard as mature minors by law, or those legally married who are aged between 15-17 years and/or are free from any legally competent representative as defined by law in Malawi.	CHECK COLUMN 6, IF NO, when was the last time, (**NAME**) slept the night in the household?				
		MONTH (SEE CODES BELOW)	YEAR	Is (**NAME**) in another district or country?	Which district or country is (**NAME**) in currently? (SEE CODES BELOW)	Has (**NAME**) been very sick for at least 3 months during the past 12 months, that is (**NAME**) was too sick to work or do normal activities?
(1)	(9)	(10)		(11)	(12)	(13)
9	Y N		____ DK = -8 REFUSED = -9	Y N		Y N
10	Y N		____ DK = -8 REFUSED = -9	Y N		Y N

☐ **TICK HERE IF CONTINUATION SHEET USED**

Just to make sure I have a complete listing, are there any other persons such as small children or infants that we have not listed? YES ☐ NO ☐

Are there any other people such as domestic servants or friends who may not be members of your household who usually live here? YES ☐ NO ☐

Are there any guests or temporary visitors staying here, or anyone else who stayed here last night who we have not seen and listed? YES – NO ☐

ADD TO SCHEDULE

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

CODES FOR COLUMN 10: LAST TIME SLEPT IN HOUSEHOLD

01 = JANUARY
02 = FEBRUARY
03 = MARCH
04 = APRIL
05 = MAY
06 = JUNE
07 = JULY
08 = AUGUST
09 = SEPTEMBER
10 = OCTOBER
11 = NOVEMBER
12 = DECEMBER
-8 = DON'T KNOW
-9 = REFUSED MONTH

CODES FOR COLUMN 12: DISTRICT/COUNTRY PRESENTLY IN

01 = DOWA
02 = KASUNGU
03 = LILONGWE
04 = MCHINJI
05 = NKHOTAKOTA
06 = NTCHEU
07 = NTCHISI
08 = SALIMA
09 = CHITIPA
10 = KARONGA
11 = LIKOMA
12 = MZIMBA
13 = NKHATA BAY
14 = RUMPHI
15 = BALAKA
16 = BLANTYRE
17 = CHIKWAWA
18 = CHIRADZULU
19 = MACHINGA
20 = MANGOCHI
21 = MULANJE
22 = MWANZA
23 = NSANJE
24 = THYOLO
25 = PHALOMBE
26 = ZOMBA
27 = NENO
28 = ZAMBIA
29 = TANZANIA
30 = MOZAMBIQUE
31 = ZIMBABWE
32 = NIGERIA
33 = RWANDA
34 = BURUNDI
35 = DRC
36 = SOUTH AFRICA
96 = OTHER (SPECIFY) _____
-8 = DON'T KNOW
-9 = REFUSED

HOUSEHOLD SCHEDULE (for minors—skip if emancipated)

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

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

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

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

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
SUPPORT FOR ORPHANS AND VULNERABLE CHILDREN/MINORS			
101	DO NOT READ: CHECK COLUMN 7 IN THE HOUSEHOLD SCHEDULE. **ANY CHILD AGE 0-17 YEARS?** (SKIP IF EMANCIPATED)	NUMBER OF CHILDREN 0-17 YRS: ☐☐	NONE→114
102	DO NOT READ: CHECK COLUMN 25 IN THE HOUSEHOLD SCHEDULE. **ANY CHILD WHOSE MOTHER HAS DIED OR IS VERY SICK?**	YES ..... 1 NO 2	YES→104
103	DO NOT READ: CHECK COLUMN 26 IN THE HOUSEHOLD SCHEDULE. **ANY CHILD WHOSE FATHER HAS DIED OR IS VERY SICK?**	YES ..... 1 NO 2	NO→114
104	**Record names, line numbers, and ages of all children 0-17 who are identified in columns 25, and 26 as having a mother and/or father who has died or has been very sick.**		

	CHILD (1)	CHILD (2)	CHILD (3)
NAME	_____	_____	_____
LINE NUMBER (FROM COLUMN 1)	☐☐	☐☐	☐☐
AGE (FROM COLUMN 7)	☐☐	☐☐	☐☐

INTERVIEWER SAYS: "I would like to ask you about any formal, organized help or support for children that your household may have received for which you did not have to pay. By formal, organized support, I mean help provided by someone working for a program. This program could be government, private, religious, charity, or community-based."

		CHILD (1)	CHILD (2)	CHILD (3)
105	Now I would like to ask you about the support your household received for (**NAME**). In the last 12 months, has your household received any medical support for (**NAME**), such as medical care, supplies, or medicine, for which you did not have to pay?	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9
106	In the last 12 months, has your household received any medical support for (**NAME**), such as medical care, supplies, or medicine, for which you did not have to pay?	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9
107	In the last 12 months, has your household received any emotional or psychological support for (**NAME**), such as companionship, counseling from a trained counselor, or spiritual support, which you received at home and for which you did not have to pay?	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9 NO, DK, R → 109	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9 NO, DK, R → 109	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9 NO, DK, R → 109
108	Did your household receive any of this emotional or psychological support for (**NAME**) in the past 3 months?	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES		SKIP
SUPPORT FOR ORPHANS AND VULNERABLE CHILDREN (continued)				
109	In the last 12 months, has your household received any material support for (NAME), such as clothing, food, or financial support, for which you did not have to pay?	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9 NO, DK, R → 111	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9 NO, DK, R → 111	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9 NO, DK, R → 111
110	Did your household receive any of this material support for (**NAME**) in the past 3 months?	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9
111	In the last 12 months, has your household received any social support for (NAME) such as help in household work, training for a caregiver, or legal services, for which you did not have to pay?	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9 NO, DK, R → 113	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9 NO, DK, R → 113	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9 NO, DK, R → 113
112	Did your household receive any of this social support for (**NAME**) in the past 3 months?	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9
113	In the last 12 months, has your household received any support for (**NAME**)'s schooling, such as allowance, free admission, books, or supplies, for which you did not have to pay?	YES ..... 1 NO, DID NOT RECEIVE SUPPORT ..... 2 NO, CHILD DOES NOT ATTEND SCHOOL ..... 3 DON'T KNOW ..... -8 REFUSED ..... -9	YES ..... 1 NO, DID NOT RECEIVE SUPPORT ..... 2 NO, CHILD DOES NOT ATTEND SCHOOL ..... 3 DON'T KNOW ..... -8 REFUSED ..... -9	YES ..... 1 NO, DID NOT RECEIVE SUPPORT ..... 2 NO, CHILD DOES NOT ATTEND SCHOOL ..... 3 DON'T KNOW ..... -8 REFUSED ..... -9

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

MATRIX END

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

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

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

☐ **TICK IF CONTINUATION SHEET REQUIRED.**

IF NO OTHER CHILDREN, CONTINUE HOUSEHOLD INTERVIEW.

HOUSEHOLD DEATHS

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

114	Has any usual resident of your household died since January 1, 2018?	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9	IF NO, DON´T KNOW, REFUSE

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES			SKIP
HOUSEHOLD DEATHS (continued)					
115	How many usual household residents died since January 1, 2017?	NUMBER OF DEATHS ☐☐			
ASK 116-119 AS APPROPRIATE FOR EACH PERSON WHO DIED. IF THERE WERE MORE THAN 3 DEATHS USE ADDITIONAL QUESTIONNAIRES.					
116	What was the name of the person who died (most recently/before him/her)? (Swipe forward to enter DON'T KNOW or REFUSED.)	NAME 1ST DEATH _____	NAME 2ND DEATH _____	NAME 3RD DEATH _____	
117	When did (**NAME**) die? Please give your best guess	DAY ☐☐ MONTH ☐☐ YEAR ☐☐ DON'T KNOW.....-8 REFUSED.....-9	DAY ☐☐ MONTH ☐☐ YEAR ☐☐ DON'T KNOW.....-8 REFUSED.....-9	DAY ☐☐ MONTH ☐☐ YEAR ☐☐ DON'T KNOW.....-8 REFUSED.....-9	
118	Was (**NAME**) male or female?	MALE .....1 FEMALE.....2 DON'T KNOW.....-8 REFUSED.....-9	MALE .....1 FEMALE.....2 DON'T KNOW.....-8 REFUSED.....-9	MALE .....1 FEMALE.....2 DON'T KNOW.....-8 REFUSED.....-9	
119	How old was (**NAME**) when (he/she) died? RECORD DAYS IF LESS THAN 1 MONTH, MONTHS IF LESS THAN 1 YEAR, AND COMPLETED YEARS IF 1 YEAR OR MORE.	DAYS ☐☐ MONTHS ☐☐ YEARS ☐☐ DON'T KNOW.....-8 REFUSED.....-9	DAYS ☐☐ MONTHS ☐☐ YEARS ☐☐ DON'T KNOW.....-8 REFUSED.....-9	DAYS ☐☐ MONTHS ☐☐ YEARS ☐☐ DON'T KNOW.....-8 REFUSED.....-9	

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

☐ **TICK IF CONTINUATION SHEET REQUIRED.**

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
HOUSEHOLD CHARACTERISTICS			
INTERVIEWER SAYS: "Now I would like to ask you more questions about your household."			
201	What is the main source of drinking water for members of your household?	**PIPED WATER** PIPED INTO DWELLING ..... 11 PIPED TO YARD/PLOT ..... 12 PUBLIC TAP/STANDPIPE ..... 13 TUBE WELL OR BOREHOLE ..... 21 **DUG WELL** PROTECTED WELL ..... 31 UNPROTECTED WELL ..... 32 **WATER FROM SPRING** PROTECTED SPRING ..... 41 UNPROTECTED SPRING ..... 42 RAINWATER ..... 51 TANKER TRUCK ..... 61 CART WITH SMALL TANK ..... 71 SURFACE WATER (RIVER/DAM/LAKE/ POND/ STREAM/CANAL) ..... 81 BOTTLED WATER ..... 91 GALLON WATER ..... 92 OTHER ..... 96 _____ (SPECIFY) DON'T KNOW ..... -8 REFUSED ..... -9	
202	What kind of toilet facility do members of your household usually use?	FLUSH OR POUR FLUSH TOILET ..... 11 TRADITIONAL PIT LATRINE ..... 21 VENTILATED IMPROVED PIT LATRINE (VIP) ... 22 NO FACILITY/BUSH/FIELD ..... 61 OTHER ..... 96 _____ (SPECIFY) DON'T KNOW ..... -8 REFUSED ..... -9	IF NO FACILITY/BUSH/ FIELD = DK, R → 204
203	Do you share this toilet facility with other households?	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9	

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
HOUSEHOLD CHARACTERISTICS (continued)			
204	Does your household have:	ELECTRICITY ..... A A WORKING RADIO ..... B A WORKING TELEVISION ..... C A WORKING TELEPHONE/ MOBILE TELEPHONE ..... D A WORKING REFRIGERATOR ..... E NONE OF THE ABOVE ..... F DON'T KNOW ..... Y REFUSED ..... Z	
205	What type of fuel does your household mainly use for cooking?	ELECTRICITY ..... 1 LPG / NATURAL GAS ..... 2 BIOGAS ..... 3 PARAFFIN / KEROSENE ..... 4 COAL, LIGNITE ..... 5 CHARCOAL FROM WOOD ..... 6 FIREWOOD / STRAW/SHRUBS ..... 7 DUNG ..... 8 AGRICULTURAL CROPS ..... 9 NO FOOD COOKED IN HOUSEHOLD ..... 95 OTHER (SPECIFY ..... 96 _____ DON'T KNOW ..... -8 REFUSED ..... -9	
206	MAIN MATERIAL OF FLOOR (record observation)	**NATURAL FLOOR** EARTH/SAND/MUD ..... 11 DUNG ..... 12 **RUDIMENTARY FLOOR** WOOD PLANKS ..... 21 PALM / BAMBOO ..... 22 **FINISHED FLOOR** PARQUET OR POLISHED WOOD ..... 31 VINYL/ASHPHALT STRIPS ..... 32 CERAMIC TILES ..... 33 CEMENT/TERAZO ..... 34 CARPET ..... 35 OTHER ..... 96 _____ (SPECIFY)	

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
HOUSEHOLD CHARACTERISTICS (continued)			
207	MAIN MATERIAL OF THE ROOF (record observation)	**NATURAL ROOFING** NO ROOF ..... 11 THATCH/GRASS ..... 12 DUNG/MUD ..... 13 **RUDIMENTARY ROOFING** CORRUGATED IRON(MABATI) ..... 21 TIN CANS ..... 22 **FINISHED ROOFING** ASBESTOS SHEET/CEMENT FIBER ..... 31 CONCRETE ..... 32 TILES ..... 33 OTHER ..... 96 _____ (SPECIFY)	
208	MAIN MATERIAL OF THE EXTERIOR WALLS (record observation)	**NATURAL WALLS** NO WALLS ..... 11 CANE/PALM/TRUNKS ..... 12 DUNG / MUD ..... 13 **RUDIMENTARY WALLS** BAMBOO WITH MUD ..... 21 STICKS WITH MUD ..... 22 PLYWOOD/CARDBOARD ..... 23 CARTON ..... 24 REUSED WOOD ..... 25 **FINISHED WALLS** CEMENT ..... 31 STONE WITH LIME/CEMENT ..... 32 BRICKS ..... 33 CEMENT BLOCKS ..... 34 WOOD PLANKS/SHINGLES ..... 35 OTHER ..... 96 _____ (SPECIFY)	
209	How many rooms are used for sleeping?	NUMBER OF ROOMS ☐☐	
210	Does any member of your household own: (Read all responses aloud. Select all that apply.)	A BICYCLE ..... A A WORKING MOTORCYCLE OR MOTOR SCOOTER ..... B A WORKING CAR OR TRUCK ..... C A WORKING BOAT WITH A MOTOR ..... D NONE OF THE ABOVE ..... E DON'T KNOW ..... Y REFUSED ..... Z	

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
HOUSEHOLD CHARACTERISTICS (continued)			
211	Altogether, how many COWS do members of your household own?	NUMBER OF COWS ☐☐ OWN BUT NOT SURE HOW MANY .....-7 REFUSED ..... -9	
212	Altogether, how many GOATS/SHEEP do members of your household own?	NUMBER OF GOATS/SHEEP ☐☐ OWN BUT NOT SURE HOW MANY .....-7 REFUSED ..... -9	
213	Altogether, how many POULTRY (e.g., DUCKS, CHICKENS) do members of your household own?	NUMBER OF POULTRY ☐☐ (e.g., DUCKS, CHICKENS) OWN BUT NOT SURE HOW MANY .....-7 REFUSED ..... -9	
214	Altogether, how many DOGS do members of your household own?	NUMBER OF DOGS ☐☐ OWN BUT NOT SURE HOW MANY .....-7 REFUSED ..... -9	
215	Altogether, how many HORSES do members of your household own?	NUMBER OF HORSES ☐☐ OWN BUT NOT SURE HOW MANY .....-7 REFUSED ..... -9	

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
ECONOMIC SUPPORT			
Interviewer reads: "Now I will ask you questions on economic support you have received."			
301	Has your household received any of the following forms of external economic support in the last 12 months? (INTERVIEWER: READ THE RESPONSES ALOUD. SELECT UP TO THREE RESPONSES FOR THE MOST IMPORTANT SOURCES OF OUTSIDE SUPPORT.)	NOTHING ..... A CASH TRANSFER (E.G. PENSIONS, DISABILITY GRANTS, CHILD GRANT) ..... B ASSISTANCE FOR SCHOOL FEES ..... C MATERIAL SUPPORT FOR EDUCATION (E.G. UNIFORMS, SCHOOL BOOKS, EDUCATION, TUITION SUPPORT, BURSARIES) ..... D INCOME GENERATION SUPPORT IN CASH OR KIND (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 REMITTANCES ..... I OTHER ..... X _____ (SPECIFY) DON'T KNOW ..... Y REFUSED ..... Z	IF NOTHING, DON'T KNOW, REFUSED→END OF SECTION
302	CORONA is the name given to the disease caused by a coronavirus. It is a respiratory disease that is easily contagious and in most cases presents itself as the common flu. In a few cases, the disease can be serious. Was any of this external economic support related to CORONA?	YES ..... 1 NO ..... 2 DON'T KNOW ..... -8 REFUSED ..... -9	

END OF HOUSEHOLD INTERVIEW

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

END TIME

END	RECORD THE END TIME. USE 24 HOUR TIME. IF START TIME IS 3:12 PM, RECORD 15 HOURS, 12 MINUTES, NOT 03 HOURS, 12 MINUTES.	HOUR: ☐☐ MINUTES: ☐☐	

INTERVIEWER OBSERVATIONS:

TO BE COMPLETED AFTER THE INTERVIEW:

COMMENTS ABOUT RESPONDENT:

COMMENTS ABOUT SPECIFIC QUESTIONS:

GENERAL QUESTIONS:

APPENDIX F ADULT QUESTIONNAIRE

LANGUAGE			
NO	**QUESTIONS**	**CODING CATEGORIES**	**SKIPS/FILTERS COMMENTS**
Interviewer says: "Thank you for agreeing to participate in this survey. The first set of questions is about your life in general. Afterwards, we will move on to other topics."			
L1	LANGUAGE OF QUESTIONNAIRE	ENGLISH=1 CHICHEWA=2 TUMBUKA=3	
L2	LANGUAGE OF INTERVIEW	ENGLISH=1 CHICHEWA=2 TUMBUKA=3 OTHER =96 _____ (SPECIFY)	
L3	NATIVE LANGUAGE OF PARTICIPANT	ENGLISH=1 CHICHEWA =2 TUMBUKA =3 YAO=4 OTHER =96 (SPECIFY): _____	
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	Have you ever attended school?	YES=1 NO=2 DON'T KNOW=-8 REFUSED=-9	IF NO, DON'T KNOW, REFUSED → 104
102	Are you currently enrolled in school?	YES=1 NO=2 DON'T KNOW=-8 REFUSED=-9	
103	What is your highest class/form/year you have completed?	STANDARD 1-4=1 STANDARD 5-8=2 FORM 1-2=3 FORM 3-4=4 POST SECONDARY=5 DON'T KNOW=-8 REFUSED=-9	
104	How long have you lived in this area or community?	MONTHS ____=2 YEARS ____=3 I HAVE ALWAYS LIVED HERE = 3 DON'T KNOW = -8 REFUSED = -9	IF YEARS OR HAVE ALWAYS LIVED HERE → 110
105	Just before you moved here, did you live in a city, in a town (BOMA, Bid trading centre) or in a rural area?	CITY=1 TOWN=2 RURAL AREA=3 DON'T KNOW=-8 REFUSED=-9	

NO.	QUESTIONS	CODING CATEGORIES	SKIPS/FILTERS COMMENTS
MODULE 1: RESPONDENT BACKGROUND (continued)			
106	Before you moved here, which DISTRICT did you live in? If you lived outside of MALAWI, which country did you live in?	DEDZA....1 DOWA....2 KASUNGU....3 LILONGWE....4 MCHINJI....5 NKHOTAKOTA....6 NTCHEU....7 NTCHISI....8 SALIMA....9 CHITIPA....10 KARONGA....11 LIKOMA....12 MZIMBA....13 NKHATA BAY....14 RUMPHI....15 BALAKA....16 BLANTYRE....17 CHIKWAWA....18 CHIRADZULU....19 MACHINGA....20 MANGOCHI....21 MULANJE....22 MWANZA....23 NSANJE....24 THYOLO....25 PHALOMBE....26 ZOMBA....27 NENO....28 ZAMBIA....29 TANZANIA....30 MOZAMBIQUE....31 ZIMBABWE....32 NIGERIA....33 RWANDA....34 BURUNDI....35 DRC....36 SOUTH AFRICA....37 OTHER (SPECIFY)....96 _____ DON'T KNOW....-8 REFUSED....-9	
107	In the last 12 months, have you ever lived away from home?	YES = 1 NO = 2 DON'T KNOW =-8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → 110
108	The last time you were away (during the last 12 months), how long were you away from home?	TOTAL DAYS ____ =1 TOTAL MONTHS ____ =2 DON'T KNOW=-8 REFUSED=-9	
109	In the last 12 months, how many times were you away from home?	NUMBER OF TIMES ____ DON'T KNOW=-8 REFUSED=-9	
110	Have you ever lived away from home for more than 1 month at a time?	YES=1 NO=2 DON'T KNOW=-8 REFUSED=-9	IF NO, DON'T KNOW, REFUSED → 112

NO.	QUESTIONS	CODING CATEGORIES	SKIPS/FILTERS COMMENTS
MODULE 1: RESPONDENT BACKGROUND (continued)			
111	When was the last time you lived away from home for over a month?	MONTH_____ DON'T KNOW MONTH=-8 REFUSED MONTH=-9 YEAR_____ DON'T KNOW YEAR=-8 REFUSED YEAR=-9	IF DON'T KNOW OR REFUSED MONTH, IF DON'T KNOW OR REFUSED YEAR → 115
112	How many times have you been away from home for one or more months IN THE PAST YEAR?	NUMBER OF TIMES ____ DON'T KNOW=-8 REFUSED=-9	
113	The last time you were away from home for more than one month, where were you? Interviewer: If you were in more than one place while you were away, please give the place you spent the most time.	ANOTHER COMMUNITY IN THIS DISTRICT=1 ANOTHER DISTRICT IN THIS REGION=2 DEDZA=3 DOWA=4 KASUNGU=5 LILONGWE=6 MCHINJI=7 NKHOTAKOTA=8 NTCHEU=9 NTCHISI=10 SALIMA=11 CHITIPA=12 KARONGA=13 LIKOMA=14 MZIMBA=15 NKHATA BAY=16 RUMPHI=17 BALAKA=18 BLANTYRE=19 CHIKWAWA=20 CHIRADZULU=21 MACHINGA=22 MANGOCHI=23 MULANJE=24 MWANZA=25 NSANJE=26 THYOLO=27 PHALOMBE=28 ZOMBA=29 NENO=30 ZAMBIA=31 TANZANIA=32 MOZAMBIQUE=33 ZIMBABWE=34 NIGERIA=35 RWANDA=36 BURUNDI=37 DRC=38 SOUTH AFRICA=39 OTHER (SPECIFY)=96 _____ DON'T KNOW = -8 REFUSED = -9	

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE 1: RESPONDENT BACKGROUND (continued)			
114	What was the main reason you went there?	WORK=1 BUSINESS/TRADING=2 MEETING=3 DRIVERS=4 FARM WORK=5 FISHING=6 SCHOOL/UNIVERSITY=7 FAMILY/MARRIAGE=8 ACCESS HEALTH OR OTHER SERVICES=9 CONFLICT OR NATURAL DISASTER (FLOODS, CYCLONE, DROUGHT)=10 COVID-19 PANDEMIC (CORONA)=11 OTHER (SPECIFY)=96 _____ DON'T KNOW=-8 REFUSED=-9	
115	Have you done any work in the last 12 months for which you received cash or goods as payment? This includes work on the family farm or business for which you may not have been paid directly.	YES=1 NO=2 DON'T KNOW=-8 REFUSED=-9	IF NO, DON'T KNOW, REFUSED SKIP TO NEXT MODULE
116	Have you done any work in the last seven days for which you received cash or goods as payment? This includes work on the family farm or business for which you may not have been paid directly.	YES=1 NO=2 DON'T KNOW=-8 REFUSED=-9	
117	What is your occupation? That is, what kind of work do you mainly do?	MINING=1 AGRICULTURE/FARMING=2 TRANSPORT=3 CONSTRUCTION=4 UNIFORMED PERSONNEL=5 INFORMAL TRADE=6 GARMENT INDUSTRIES=7 HOUSEKEEPER=8 SEX WORKER=9 STUDENT=10 OTHER (SPECIFY) _____ DON'T KNOW=-8 REFUSED=-9	
118	Where do you normally work? In your home community, elsewhere in region/country, or outside the country?	HOME COMMUNITY=1 SAME COUNTRY, DIFFERENT COMMUNITY=2 OUTSIDE THE COUNTRY=3 DON'T KNOW=-8 REFUSED=-9	
MODULE 2: MARRIAGE			
Interviewer says: "Now I would like to ask you about your current and previous relationships and/or marriages."			
201	Have you ever been married or lived together with a [man/woman] as if married?	YES=1 NO=2 DON'T KNOW=-8 REFUSED=-9	IF NO, DON'T KNOW, REFUSED SKIP TO NEXT MODULE
202	How old were you the first time you married or started living with a [man/woman] as if married?	____YEARS OLD DON'T KNOW=-8 REFUSED=-9	

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MARRIAGE (continued)			
203	What is your marital status now: are you married, living together with someone as if married, widowed, divorced, or separated/single?	MARRIED=1 LIVING TOGETHER=2 WIDOWED=3 DIVORCED=4 SEPARATED/SINGLE=5 DON'T KNOW=-8 REFUSED=-9	IF WIDOWED, DIVORCED, SEPARATED/ SINGLE, DON'T KNOW, REFUSED, SKIP TO NEXT MODULE
Interviewer says: "The next several questions are about your current husband, wife or partner(s)."			
MARRIAGE GROUP FOR MEN			
204	Altogether, how many wives or live-in partners do you have who live with you here in this household?	NUMBER OF WIVES OR PARTNERS LIVING IN HOUSEHOLD_____ DON'T KNOW=-8 REFUSED=-9	IF NUMBER OF WIVES OR PARTNERS =0 GO TO 206
205	Please enter the name(s) of your wife/ partner that lives with you in this household.	_____ (REPEAT AS NECESSARY) NOT LISTED IN HOUSEHOLD DON'T KNOW=-8 REFUSED=-9	
206	How many wives or live-in partners do you have who live elsewhere? This would include wives or partners that you stay with or support in other households	NUMBER OF WIVES/LIVE-IN PARTNERS____ DON'T KNOW=-8 REFUSED=-9	IF NONE, DON'T KNOW, REFUSED → 301
207	You mentioned that you have wife/ wives who live elsewhere. Where are they?	STAYING IN A DIFFERENT HOUSEHOLD, SAME COMMUNITY=1 STAYING IN A DIFFERENT COMMUNITY, SAME REGION/DISTRICT=2 STAYING IN A DIFFERENT REGION/ DISTRICT=3 STAYING IN A DIFFERENT COUNTRY=4 DON'T KNOW=-8 REFUSED=-9	FOR ALL → 301
MARRIAGE GROUP FOR WOMEN			
208	Is your husband or partner living with you now or is he staying elsewhere?	LIVING IN THE HOUSEHOLD=0 STAYING IN A DIFFERENT HOUSEHOLD, SAME COMMUNITY=1 STAYING IN A DIFFERENT COMMUNITY, SAME REGION/DISTRICT=2 STAYING IN A DIFFERENT REGION/ DISTRICT=3 STAYING IN A DIFFERENT COUNTRY=4 DON'T KNOW=-8 REFUSED=-9	IF LIVING IN THE HOUSEHOLD → 211
209	Please select the husband/partner who lives with you (SEE LIST OF PERSONS ON HH ROSTER)	_____ NOT LISTED IN HOUSEHOLD=96 DON'T KNOW=-8 REFUSED=-9	
210	Please enter the name of your husband/partner that lives with you.	_____ DON'T KNOW=-8 REFUSED=-9	
211	Does your husband or partner have other wives or does he live with other women as if married?	YES=1 NO=2 DON'T KNOW=-8 REFUSED=-9	IF NO, DON'T KNOW, REFUSED → 301
212	Including yourself, in total, how many wives or live-in partners does your husband or partner have?	NUMBER OF WIVES/LIVE-IN PARTNERS___ DON'T KNOW=-8 REFUSED=-9	

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE 3: REPRODUCTION			
Interviewer says: "Now I would like to ask you questions about your pregnancies and your children."			
301	How many times have you had a pregnancy that resulted in a live birth? [A live birth is when the baby shows signs of life, such as breathing, beating of the heart or movement, even if the baby subsequently died.]	NUMBER OF LIVE BIRTHS ___ DON'T KNOW = -8 REFUSED = -9	IF 0, DON'T KNOW, REFUSED, SKIP 302 IF > 0 → 302
302	How many live births have you had since the 1st of January, 2017?	NUMBER OF LIVE BIRTHS ___ DON'T KNOW = -8 REFUSED = -9	
Interviewer says: "Now I would like to ask you some questions about the last pregnancy that resulted in a live birth since the 1st of January 2016."			
303	Did your last pregnancy result in birth to twins or more?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON´T KNOW, REFUSED → 305
304	What is the name of the [INSERT ORDER OF BIRTH] born child from your last pregnancy that resulted in a live birth? (If the child was not named before death, input birth and the birth order number.) Was there another multiple born alive?	NAME _____ YES = 1 NO = 2	IF YES, WILL BE REPEATED FOR EACH MULTIPLE BIRTH IF NO, → 306
305	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, even if the baby subsequently died. (IF THE CHILD WAS NOT NAMED BEFORE DEATH, INPUT BIRTH AND THE BIRTH ORDER NUMBER)	NAME _____	
306	During your last pregnancy with [CHILD NAME], did you visit a health facility for antenatal care?	YES=1 NO=2 DON'T KNOW=-9 REFUSED=-9	IF DON'T KNOW, REFUSED → 314
Interviewer says: "I will now be asking you questions on HIV testing. Please remember that your responses will be kept confidential and will not be shared with anyone else."			
307	Have you ever tested for HIV before your pregnancy with [CHILD NAME]?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → 310
308	Did you test positive for HIV before your pregnancy with [CHILD NAME]?	YES = 1 NO = 2 DON'T KNOW =-8 REFUSED =-9	IF NO, DON'T KNOW, REFUSED → 310
309	At the time of your first antenatal care visit when you were last pregnant with [CHILD NAME], were you already taking ARVs, that is, antiretroviral mediations to treat HIV?	YES = 1 NO = 2 DON'T KNOW =-8 REFUSED =-9	YES → 316 IF NO, DON´T KNOW, REFUSED → 312

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

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE 3: REPRODUCTION (continued)			
317	Is [CHILD NAME] still alive?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF YES, DON´T KNOW, REFUSED → 320
318	How old was [CHILD NAME] in years when he/she died?	___ YEARS OLD DON'T KNOW = -8 REFUSED = -9	IF >0, DON'T KNOW, REFUSED GO TO 320 CHILD IS LESS THAN ONE MONTH OLD → 319
319	How old was [CHILD NAME] in months when he/she died?	___ MONTHS OLD DON'T KNOW = -8 REFUSED = -9	IF >0 → 320
320	Did you ever breastfeed [CHILD NAME]?	YES = 1 NO, NEVER BREASTFEED = 2 NO, CHILD DIED BEFORE BREASTFEEDING = 3 DON'T KNOW = -8 REFUSED = -9	IF NO, NEVER BREASTFEED; NO, CHILD DIED BEFORE BREASTFEEDING; DON'T KNOW; REFUSED → 322
321	Are you still breastfeeding [CHILD NAME]?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	DISPLAY ONLY IF 317 = YES, DON'T KNOW, REFUSED
322	After [CHILD NAME] was born, was he/she tested for HIV?	YES = 1 NO, NOT TESTED FOR HIV = 2 NO, CHILD DIED BEFORE TESTING = 3 DON'T KNOW = -8 REFUSED = -9	IF NO, NOT TESTED FOR HIV; NO, CHILD DIED BEFORE TESTING; DON'T KNOW, REFUSED → 328
323	How old was [CHILD NAME] when he/she first tested for HIV? (ONLY ONE OPTION MAY BE ENTERED)	LESS THAN 1 WEEK = 0 WEEKS ___ = 1 MONTHS ___ = 2 YEARS ___ = 3	DISPLAY IF MONTHS AND YEARS = "NULL"
324	What was the result of [CHILD NAME]'s first HIV test?	POSITIVE; CHILD HAS HIV = 1 NEGATIVE; CHILD DOES NOT HAVE HIV = 2 UNKNOWN/INCONCLUSIVE = 3 DID NOT RECEIVE RESULTS = 4 DON'T KNOW = -8 REFUSED = -9	
325	Was [CHILD NAME] tested for HIV after you stopped breastfeeding?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF 320 = NO, NEVER BREASTFEED; NO, CHILD DIED BEFORE BREASTFEEDING; DON'T KNOW; REFUSED OR 321 = YES
326	How old was [CHILD NAME] when he/she last tested for HIV?	LESS THAN 1 WEEK = 0 WEEKS ___ = 1 MONTHS ___ = 2 YEARS ___ = 3 CHILD ONLY TESTED ONCE FOR HIV (FIRST TEST IS THE SAME AS LAST TEST) = 4 DON'T KNOW = -8 REFUSED = -9	DISPLAY IF "NULL" CHILD ONLY TESTED ONCE FOR HIV (FIRST TEST IS THE SAME AS LAST TEST), DON'T KNOW, REFUSED → 328
327	What was the result of [CHILD NAME]'s most recent HIV test?	POSITIVE; CHILD HAS HIV = 1 NEGATIVE; CHILD DOES NOT HAVE HIV = 2 UNKNOWN/INCONCLUSIVE = 3 DID NOT RECEIVE RESULTS = 4 DON'T KNOW = -8 REFUSED = -9	SKIP IF 324 = POSITIVE; CHILD HAS HIV

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE 3: REPRODUCTION (continued)			
328	Interviewer says: "Thank you for the information regarding [CHILD NAME]."		IF 303 = YES, RETURN TO 317 FOR EACH VALUE OF 304
Interviewer says: "I will now ask about current pregnancies."			
329	Are you pregnant now?	YES = 1 NO= 2 DON'T KNOW =8 REFUSED = -9	IF YES → END OF MODULE
Interviewer says: "I will now ask you about family planning."			
330	Are you or your partner currently doing something or using any method to delay or avoid getting pregnant?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, REFUSED → END OF MODULE
331	Which method are you or your partner using? (INTERVIEWER: SELECT ALL THAT APPLY.)	FEMALE STERILIZATION = A MALE STERILIZATION = B PILL = C IUD/"COIL" = D INJECTIONS = E IMPLANT = F CONDOM = G FEMALE CONDOM = H RHYTHM/NATURAL METHODS/CYCLE = I BEADS/STANDARD DAYS/WITHDRAWL = J NOT HAVING SEX = K OTHER = X _____ (SPECIFY) DON'T KNOW = Y REFUSED = Z	
MODULE 4: MALE CIRCUMCISION (SKIP IF FEMALE)			
Interviewer says: "I will be asking a few questions about circumcision. Circumcision is the complete removal of the foreskin from the penis. If you feel comfortable, I can show you a picture of an uncircumcised penis, a partially circumcised penis and a completely circumcised penis."			
401	Some men are uncomfortable talking about circumcision, but it is important for us to have this information. Some men are circumcised. Are you circumcised?	YES, FULLY CIRCUMCISED = 1 YES, PARTIALLY CIRCUMCISED = 2 NOT CIRCUMCISED = 3 DON'T KNOW = -8 REFUSED = -9	IF YES, FULLY CIRCUMCISED, YES, PARTIALLY CIRCUMCISED, SKIP 402 DON'T KNOW, REFUSED → END OF MODULE
402	Are you planning to get circumcised within the next 6 months?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF YES, DON'T KNOW, REFUSED → END OF MODULE
Interviewer says: "Some men are circumcised by a medical provider such as a doctor, clinical officer, nurse, or midwife. Some men are circumcised by a traditional practitioner. Some men are circumcised by both a medical provider and a traditional practitioner."			
403	Were you circumcised by a medical provider? By medical provider, I mean a doctor, clinical officer, nurse or midwife.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
404	Were you circumcised by a medical provider? By medical provider, I mean a doctor, clinical officer, nurse or midwife.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → END OF MODULE

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE 4: MALE CIRCUMCISION (SKIP IF FEMALE) (continued)			
405	How old were you when you were circumcised? Please give your best guess. (INTERVIEWER: IF LESS THAN ONE YEAR, CODE '0'.)	_____ YEARS OLD DON'T KNOW = -8 REFUSED = -9	
MODULE 5: SEXUAL ACTIVITY			
Interviewer says: "In this part of the interview, I will be asking about your sexual relationships and practices. These questions will help us better understand how they may affect your life and risk for HIV. Sex is when a penis enters a vagina or the anus." **"Remember that your answers are completely confidential and will not be shared with anyone. If there are questions that you do not want to answer, we can go to the next question."**			
501	How old were you when you had sex for the very first time? If they are unsure, confirm if they have had vaginal sex. If they said an age less than 12 years: Confirm age at first sex. Are you sure this is what the participant said?	AGE AT FIRST SEX____ NEVER HAD SEX = -96 DON'T KNOW = -8 REFUSED = -9 YES = 1 NO = 2	IF NEVER HAD SEX → NEXT MODULE IF GREATER THAN 11 YEARS OLD → 502 IF DON'T KNOW OR REFUSED → 502
502	People often have sex with different people over their lifetime. In total, with how many different people have you had sex in your lifetime? Please give your best guess.	NUMBER OF PEOPLE _____ DON'T KNOW = -8 REFUSED = -9	IF 0 → NEXT MODULE
503	How many different people have you had sex with in the last 12 months? (If none, code 'O'. If number of partners is greater than 100, enter '100.')	NUMBER OF PEOPLE___ _____ DON'T KNOW = -8 REFUSED = -9	IF 0, DON'T KNOW, REFUSED → NEXT MODULE
Interviewer says: "Now I would like to ask you some questions about the people you have had sex with in the last 12 months. Let me assure you again that your answers are completely confidential and will not be told to anyone. I will first ask you about the most recent person you had sex with." **ASK ONLY ABOUT THE LAST 3 PERSONS THE PARTICIPANT HAS HAD SEX WITH.**			
504	Is the person that you had sex with a spouse or a partner who lives in this household?	YES = 1 NO = 2	IF NO, GO TO 506
505	Please select the name below from the household membership list. Please identify the person you had sex with.	HOUSEHOLD QUESTIONNAIRE LINE NO. ____ NOT LISTED IN HOUSEHOLD=96	
506	I would like to ask you for the initials of this person so I can keep track [INITIALS]. They do not have to be the actual initials of this person. Is [INITIALS] the most recent person you had sex with?	INITIALS ___ ___ YES = 1 NO = 1	DISPLAY IF [FIRST REPORTED PARTNER]

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

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE 6: HIV TESTING			
Interviewer says: "I would like to ask you some questions about HIV testing."			
601	Have you seen a doctor, healthcare worker or nurse in a health facility in the last 12 months?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → 603
602	During any of your visits to the health facility in the last 12 months, did a doctor, healthcare worker or nurse offer you an HIV test?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
603	Have you ever tested for HIV? If no, why have you never been tested for HIV? (Select all that apply. Prompt for any more reasons.)	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9 DON'T KNOW WHERE TO TEST = A TEST COSTS TOO MUCH = B TRANSPORT COSTS TOO MUCH = C TOO FAR AWAY = D AFRAID OTHERS WILL KNOW ABOUT TEST RESULTS = E DON'T NEED TEST/LOW RISK = F DID NOT RECEIVE PERMISSION FROM SPOUSE/FAMILY = G AFRAID SPOUSE/PARTNER/FAMILY WILL KNOW RESULTS = H DON'T WANT TO KNOW I HAVE HIV = I CANNOT GET TREATMENT FOR HIV = J TEST KITS NOT AVAILIBLE = K RELIGIOUS REASONS = L COVID-19 PANDEMIC (CORONA) = M OTHER = X _____ (SPECIFY) DON'T KNOW = Y REFUSED = Z	IF YES → 604 IF DON'T KNOW, REFUSED → 611 IF OTHER → 611
604	How many times were you tested for HIV in the last 12 months?	NUMBER OF TIMES__ DON'T KNOW = -8 REFUSED = -9	
605	When was your last HIV test? Please give month and year if you can. Month Year	MONTH __ __ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR __ __ __ __ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	
606	Where was your last HIV test done?	VCT FACILITY = 1 MOBILE VCT = 2 AT HOME = 3 HEALTH CLINIC/FACILITY = 4 HOSPITAL OUTPATIENT CLINIC = 5 TB CLINIC = 6 STI CLINIC = 7 HOSPITAL INPATIENT WARDS = 8 BLOOD DONATING CENTER = 9 ANC CLINIC = 10 VMMC CLINIC = 11 OTHER = 96 _____ (SPECIFY) DON'T KNOW = -8 REFUSED = -9	

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE 6: HIV TESTING (continued)			
607	When you last tested for HIV, what was the main reason you tested?	WAS OFFERED TEST BY HEALTH CARE OR OUTREACH WORKER = 1 WANTED TO KNOW MY HIV STATUS = 2 FELT AT RISK = 3 FELT SICK = 4 NEW PARTNER = 5 PREGNANCY = 6 MY PARTNER TESTED POSITIVE = 7 PRE-MARITAL = 8 OTHER = 96 _____ (SPECIFY) DON'T KNOW = -8 REFUSED = -9	
608	What was the result of your last HIV test?	POSITIVE = 1 NEGATIVE = 2 UNKNOWN/INCONCLUSIVE = 3 DID NOT RECEIVE THE RESULT = 4 DON'T KNOW = -8 REFUSED = -9	IF NEGATIVE, UNKNOWN/ INCONCLUSIVE, DID NOT RECEIVE RESULTS, DON'T KNOW, REFUSED → 611
609	When was your first positive HIV test? Please give month and year. This will be the very first HIV-positive test result that you have received. This will be the first time a health care provider told you that you had HIV. (Probe to verify date. Suggest that they can look at treatment card if available.) Month Year	MONTH __ __ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR __ __ __ __ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	
610	When was your last negative HIV test? This would be your last negative before you tested positive. Please give month and year. (Swipe forward if no previous HIV test.) Month Year	MONTH __ __ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR __ __ __ __ DON'T KNOW YEAR = -8 REFUSED YEAR = -9 NO PREVIOUS HIV NEGATIVE TEST BEFORE THE POSITIVE TEST=3	ASK ONLY TO THOSE WHO SELF-REPORTED HIV POSITIVE (IF 608=YES OR 308=YES OR 311=POSITIVE OR 315=POSITIVE)
611	Has a healthcare provider ever told you that you have HIV?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF → 308 = POSITIVE OR 311=POSITIVE OR 315=POSITIVE OR 608=POSITIVE IF NO, DON'T KNOW, REFUSED, SKIP 612

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE 6: HIV TESTING (continued)			
612	When did a healthcare provider first tell you that you have HIV? Month Year	MONTH __ __ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR __ __ __ __ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	DISPLAY IF 611=YES
Interviewer says: "There are now HIV tests that you can do yourself at home. Some of these self-test kits allow you to test yourself for HIV by swabbing your mouth or pricking your finger and testing the fluid for HIV."			
613	Have you heard of self-testing?	YES = 1 NO = 2 DON' T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → 615
614	Have you ever tested yourself for HIV using a self-test kit?	YES = 1 NO = 2 DON' T KNOW = -8 REFUSED = -9	
615	Of the following people, who have you told that you are HIV positive? (Read the list out loud. Select all that apply.)	NO ONE = A SPOUSE/SEX PARTNER = B DOCTOR = C FRIEND = D FAMILY MEMBER = E OTHER = X _____ (SPECIFY) DON'T KNOW = Y REFUSED = Z	SHOW SCREEN IF INDIVIDUAL HAS SAID TESTED POSITIVE (IF 308=YES or 311=POSITIVE or 315=POSITIVE or 611=YES) DISPLAY IF OTHER
Interviewer says: "'PrEP' or pre-exposure prophylaxis, involves taking a daily pill to reduce of getting HIV."			
616	Have you ever heard of PrEP before now?	YES = 1 NO = 2 DON' T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → 620
617	Have you ever been offered PrEP?	YES = 1 NO = 2 DON' T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → 620
618	Have you ever taken PrEP?	YES = 1 NO = 2 DON' T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → 620
619	Are you currently taking PrEP?	YES = 1 NO = 2 DON' T KNOW = -8 REFUSED = -9	APPLY IF NEVER TESTED OR SELF-REPORTED NEGATIVE: (IF 308 <> 1 AND 311 <> 1 AND 315 <> 1 AND 608 <> 1 AND 611 <> 1) IF YES, NO, DON'T KNOW, REFUSED → END OF MODULE
620	Would you take PrEP to help prevent HIV	YES = 1 NO = 2 DON' T KNOW = -8 REFUSED = -9	APPLY IF NEVER TESTED OR SELF-REPORTED NEGATIVE: (IF 308 <> 1 AND 311 <> 1 AND 315 <> 1 AND 608 <> 1 AND 611 <> 1)

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE 7: HIV STATUS, CARE AND TREATMENT			
Interviewer says: "Now I am going to ask you more about your experience with HIV care and treatment."			
701	After learning you had HIV, have you ever received care or treatment for HIV from a doctor, clinical officer or nurse?	YES = 1 NO = 2 DON' T KNOW = -8 REFUSED = -9	IF YES → 703 IF DON´T KNOW, REFUSED → 710
702	What is the main reason why you have never received care or treatment for HIV from a doctor, clinical officer, or nurse?	FACULTY IS TOO FAR AWAY = 1 I DON'T KNOW WHERE TO GET HIV MEDICAL CARE = 2 COST OF CARE = 3 COST OF TRANSPORT = 4 I DO NOT NEED IT/FEEL HEALTHY /NOT SICK = 5 I FEAR PEOPLE WILL KNOW THAT I HAVE HIV IF I GO TO A CLINIC = 6 RELIGIOUS REASONS = 7 I'M TAKING TRADITIONAL MEDICINE = 8 DO NOT TRUST THE STAFF/QUALITY OF CARE = 9 COVID-19 PANDEMIC (CORONA) = 10 OTHER = 96 _____ (SPECIFY) DON'T KNOW = -8 REFUSED = -9	IF OTHER → 710
703	Are you currently receiving HIV care from a health facility?	YES = 1 NO = 2 DON' T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → 706
704	At which facility are you currently receiving HIV care? (Select district.) (Select facility.) (If facility information is available, please key. Otherwise swipe forward to continue.)	[LIST OF FACILITY DISTRICTS] _____ DISTRICT NOT ON LIST=99 [LIST OF FACILITIES] FACILITY NOT ON LIST=99 _____	DISPLAY IF 703 = YES IF NOT ON LIST, SKIP 705
705	In the past year, did you change the clinic where you receive HIV care?	YES = 1 NO = 2 DON' T KNOW = -8 REFUSED = -9	
706	At your last HIV care visit, approximately how long did it take you to travel from your home (or workplace) one-way?	LESS THAN HALF HOUR = 1 HALF HOUR TO ONE HOUR = 2 ONE TO TWO HOURS = 3 MORE THAN TWO HOURS = 4 DON'T KNOW = -8 REFUSED = -9	
707	Does travel time to health facility make it difficult for you to access care?	YES = 1 NO = 2 DON' T KNOW = -8 REFUSED = -9	
708	At your last HIV care visit, how long did it take you to access HIV care and/ or ARVs refill?	LESS THAN ONE HOUR = 1 ONE TO TWO HOURS = 2 MORE THAN TWO HOURS = 3 DON'T KNOW = -8 REFUSED = -9	

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE 7: HIV TESTING (continued)			
709	When did you last see a doctor, clinical officer, pharmacist or nurse for HIV treatment or care? Month Year	MONTH __ __ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR __ __ __ __ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	
710	Have you ever taken ARVs, that is, antiretroviral medications to treat HIV infection?	YES = 1 NO=2 DON'T KNOW = !8 REFUSED = !9	IF YES → 712 IF DON'T KNOW, REFUSED AND 701 <> DON'T KNOW, REFUSED → 724 IF DON'T KNOW, REFUSED AND 701 = DON'T KNOW, REFUSED GO TO 801
711	What is the main reason you have never taken ARVs?	NOT ELIGIBLE FOR TREATMENT = 1 HEALTH CARE PROVIDER DID NOT PRESCRIBE = 2 HIV MEDICINES ARE NOT AVAILIBLE = 3 I FEEL HEALTHY/NOT SICK = 4 COST OF CARE = 5 RELIGIOUS REASONS = 6 TAKING TRADITIONAL MEDICATIONS = 7 NOT ATTENDING HIV CLINIC = 8 CLINIC IS TOO FAR = 9 COVID-19 PANDEMIC (CORONA) = 10 OTHER = 96 _____ (SPECIFY) DON'T KNOW = -8 REFUSED = -9	IF OTHER → 724
712	What month and year did you first start taking ARVs? (Probe to verify date.) Month Year	MONTH __ __ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR __ __ __ __ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	
713	Are you currently taking ARVs, that is, antiretroviral medications? By currently, I mean that you may have missed some doses but you are still taking ARVs.	YES = 1 NO=2 DON'T KNOW = -8 REFUSED = -9	IF YES → 715 IF DON'T KNOW, REFUSED GO TO 724

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE 7: HIV TESTING (continued)			
714	Can you tell me the main reason you stopped taking ARVs?	I HAD TROUBLE TAKING A TABLET EVERYDAY = 1 I HAD SIDE EFFECTS = 2 FACILITY TOO FAR AWAY FOR ME TO GET MEDICINE REGULARLY = 3 COST OF CARE = 4 I FEEL HEALTHY/SICK = 5 FACILITY OUT OF STOCK = 6 RELIGIOUS REASONS = 7 TAKING TRADITIONAL MEDICATIONS = 8 OTHER = 96 _____ (SPECIFY) DON'T KNOW = -8 REFUSED = -9	
715	How do you normally receive your ARVs? (Read each response. Select the most common method of collection.) At which health facility do you normally collect your ARVs? (Select district.)	PICK UP AT THE LOCAL CLINIC = 1 PICK UP AT THE HOSPITAL = 2 FROM THE COMMUNITY SUPPORT GROUP/ ADHERENCE CLUB = 3 THEY ARE DELIVERED TO MY HOME = 4 A FAMILY MEMBER/FRIEND COLLECTS THEM = 5 DON'T KNOW = -8 REFUSED = -9 [LIST OF FACILITY DISTRICTS] ___ DISTRICT NOT ON LIST = 99	IF FROM THE COMMUNITY SUPPORT GROUP/ ADHERENCE CLUB, DON'T KNOW, REFUSED GO TO 716
716	Since March 2020, the CORONA pandemic has affected many medical services including HIV testing and HIV care and treatment. Was there any period since March 2020 when you obtained (or were told to obtain) your ARV in a different way or place than where you usually receive them?	YES = 1 NO=2 DON'T KNOW = -8 REFUSED = -9	
717	The last time you picked up or received your ARVs, how much supply were you given? You should include both your prescription and any extra you were given. (Use weeks if less than one month. Swipe forward to enter DON'T KNOW or REFUSED.) Number of Weeks or Months of Supply Units	_____WEEKS = 1 _____MONTHS = 2 DON'T KNOW = -8 REFUSED = -9 DID NOT GET ARVS = 4 DON'T KNOW = -8 REFUSED = -9	DISPLAY IF WEEKS AND MONTHS "NULL"
718	The last time you picked up or received your ARVs, were you told that you were given an extra supply because of the CORONA pandemic?	YES = 1 NO=2 DON'T KNOW = -8 REFUSED = -9	
719	Have your ARVs ever been changed or modified?	YES = 1 NO=2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED GO TO 724

NO.	QUESTIONS	CODING CATEGORIES	SKIP/FILTERS
MODULE 7: HIV TESTING (continued)			
720	Why were your ARVs changed?	I WAS NOT RESPONDING TO MY FIRST TREATMENT = 1 MY VIRAL LOAD WASN'T SUPPRESSED = 2 I WANTED TO GET PREGNANT OR WAS PREGNANT = 3 I WAS HAVING/WORRIED ABOUT SERIOUS SIDE EFFECTS = 4 OTHER = 96 _____ (SPECIFY) DON'T KNOW = -8 REFUSED = -9	
721	You said before that you had been away from home during the past year. At any point in the past year were you away from home, was there any period when you interrupted your ARV treatment? How did you get your ARVs when you are away from home for more than a month?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	ONLY ASK IF 110 >= 1
722	Since March 2020, the CORONA pandemic has affected many medical services including HIV testing and HIV care and treatment. Was there any period since March 2020 when your ARV treatment was interrupted due to the CORONA pandemic?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
723	People sometimes forget to take all of their ARVs every day. In the last 30 days, how many days have you missed taking any of your ARV pills? (ENTER '0' if NONE.)	NUMBER OF DAYS_____ DON'T KNOW = -8 REFUSED = -9	
724	Did you ever have a viral load test? This is a test that measure how much HIV is in your blood.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED GO TO 727
725	When did you last have a viral load test? Month Year	MONTH_____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR_____ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	
726	Did you receive the results of your last viral load test?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
727	At your last HIV medical care visit, were you asked if you had any of the following tuberculosis or TB symptoms: (Read all responses aloud. Select all that apply.)	PERSISTENT COUGH? = A FEVER? = B NIGHT SWEATS? = C WEIGHT LOSS? = D NONE OF THE ABOVE = E DON'T KNOW = Y REFUSED = Z	

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE 7: HIV TESTING (continued)			
728	Have you ever taken medicine or a pill to prevent you from coming down with TB? This is sometimes known as TB Preventative Therapy or TPT. An example of TPT is Isoniazid, IPT or INH, which is medication that prevents TB. It is given to people with HIV or people who are in contact with someone with TB. It is not treatment for TB.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED GO TO 801
729	Are you currently taking TPT? By currently, I mean that you may have missed some doses but you are still taking TPT.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED GO TO 801
730	How many months have you taken TPT?	MONTHS_____ DON'T KNOW = -8 REFUSED = -9	
MODULE 8: TUBERCULOSIS			
Interviewer says: "Now I will ask you about tuberculosis or TB."			
801	In the last 12 months, did you visit a clinic for TB diagnosis or treatment?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED AND MALE GO TO 812 IF NO, DON'T KNOW, REFUSED AND FEMALE=2 GO TO 807
802	When you visited a TB clinic in the last 12 months, were you tested for HIV?	YES = 1 NO, WAS NOT TESTED FOR HIV = 2 NO, ALREADY KNOW I AM HIV POSITIVE = 3 DON'T KNOW = -8 REFUSED = -9	
803	In the last 12 months, were you told by a doctor, clinical officer or nurse that you had TB?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED AND MALE → 812 IF NO, DON'T KNOW, REFUSED AND FEMALE=2 GO TO 807
804	In the last 12 months, were you treated for TB?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED AND MALE → 812 IF NO, DON'T KNOW, REFUSED AND FEMALE=2 GO TO 807
805	Are you currently on treatment for TB?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED AND MALE → 812 IF NO, DON'T KNOW, REFUSED AND FEMALE=2 GO TO 807
806	The last time you were treated for TB, did you complete at least 6 months of treatment?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF MALE → 813

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE 8: TUBERCULOSIS (continued)			
Interviewer says: "Now I am going to ask you about tests a health care provider can do to check for cervical cancer. The cervix connects the uterus to the vagina. The tests a healthcare provider can do to check for cervical cancer are called a Pap smear, HIV test and VIA test." For a Pap smear and HPV test, a health care provider puts a small stick inside the vagina to wipe the cervix and sends the sample to the laboratory. For a VIA test, a healthcare worker puts vinegar on the cervix and looks to see if the cervix changes color.			SKIP IF MALE
807	Have you ever been tested for cervical cancer?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → 813
808	What method of cervical cancer testing did you receive?	VIA (VINEGAR METHOD) = 1 PAP SMEAR = 2 HPV TEST = 3 DON'T KNOW = -8 REFUSED = -9	
809	What month and year was your last test for cervical cancer? Month Year	MONTH_____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR_____ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	
810	What was the result of your last test for cervical cancer?	NORMAL/NEGATIVE = 1 ABNORMAL/POSITIVE = 2 SUSPECT CANCER = 3 UNCLEAR/INCONCLUSIVE = 4 DID NOT RECEIVE RESULTS = 5 DON'T KNOW = -8 REFUSED = -9	IF NORMAL/NEGATIVE, DON'T KNOW, REFUSED → 812
811	Did you receive treatment after your last test for cervical cancer? Did you receive treatment on the same day or on a different day?	YES, I WAS TREATED ON THE SAME DAY = 1 YES, I RECEIVED TREATMENT ON A DIFFERENT DAY = 2 NO = 3 DON'T KNOW = -8 REFUSED = -9	
812	Have you ever been vaccinated to prevent cervical cancer? This would be the HPV vaccine.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
Interviewer says: "I am now going to ask you about other aspects of health."			
813	Over the past two weeks, how often have you been bothered by having little interest in doing things?	NOT AT ALL = 1 1-7 DAYS = 2 8-11 DAYS = -3 12-14 DAYS = -4 DON'T KNOW = -8 REFUSED = -9	
814	Over the past two weeks, how often have you felt down, depressed or hopeless?	NOT AT ALL = 1 1-7 DAYS = 2 8-11 DAYS = -3 12-14 DAYS = -4 DON'T KNOW = -8 REFUSED = -9	
815	Over the past two weeks, how often have you felt nervous, anxious or on edge?	NOT AT ALL = 1 1-7 DAYS = 2 8-11 DAYS = -3 12-14 DAYS = -4 DON'T KNOW = -8 REFUSED = -9	

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE 8: TUBERCULOSIS (continued)			
816	Over the past two weeks, how often have you not been able to stop or control worrying?	NOT AT ALL = 1 1-7 DAYS = 2 8-11 DAYS = -3 12-14 DAYS = -4 DON'T KNOW = -8 REFUSED = -9	
817	Have you ever been told by a doctor or health worker that you have any of the following chronic health conditions? (Select all that apply.)	HIGH BLOOD SUGAR OR DIABETES = A HIGH BLOOD PRESSURE OR HYPERTENSION = B HEART DISEASE OR CHRONIC HEART CONDITION = C KIDNEY DISEASE = D CANCER OR TUMOR = E LUNG DISEASE OR CHRONIC LUNG DISEASE = F DEPRESSION OR MENTAL HEALTH CONDITION = G NONE OF THE ABOVE = I OTHER = 96 _____ (SPECIFY) DON'T KNOW = Y REFUSED = Z	IF NONE OF THE ABOVE, DON'T KNOW, REFUSED → 819
818	Are you currently taking medication for any of the following chronic health conditions? (If any of the conditions in the previous question are selected, respondent should be asked about treatment for that condition.)	HIGH BLOOD SUGAR OR DIABETES = A HIGH BLOOD PRESSURE OR HYPERTENSION = B HEART DISEASE OR CHRONIC HEART CONDITION = C KIDNEY DISEASE = D CANCER OR TUMOR = E LUNG DISEASE OR CHRONIC LUNG DISEASE = F DEPRESSION OR MENTAL HEALTH CONDITION = G NONE OF THE ABOVE = I OTHER = X _____ (SPECIFY) DON'T KNOW = Y REFUSED = Z	
819	Has the CORONA pandemic compromised your ability to access health care services?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF NO, DON'T KNOW, REFUSED → NEXT MODULE
820	Which health care services were difficult to access? (Read all responses aloud. Select all that apply.)	TB PREVENTATIVE THERAPY (TPT) = A VIRAL LOAD TESTING = B CONTRACEPTION/CONDOMS = C CERVICAL CANCER SCREENING = D OTHER = X _____ (SPECIFY) DON'T KNOW = Y REFUSED = Z	

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE 9: ALCOHOL USE			
Interviewer says: "The next few questions will be on your use of alcohol. Remember, all of the answers you provide will be kept confidential."			
901	How often do you have a drink containing alcohol?	NEVER = 0 MONTHLY OR LESS = 1 2-4 TIMES A MONTH = 2 2-3 TIMES A WEEK = 3 4 OR MORE TIMES A WEEK = 4 DON'T KNOW = -8 REFUSED = -9	IF NEVER, DON'T KNOW, REFUSED → 1001
902	How many drinks containing alcohol do you have on a typical day?	1 OR 2=0 3 OR 4=1 5 OR 6=2 7 TO 9=3 10 OR MORE=4 DON'T KNOW=-8 REFUSED=-9	
903	How often do you have six or more drinks on one occasion?	NEVER = 0 LESS THAN MONTHLY = 1 MONTHLY = 2 WEEKLY = 3 DAILY OR ALMOST DAILY = 4 DON'T KNOW = -8 REFUSED = -9	
MODULE 10: EXPOSURE TO PREVENTION INTERVENTION AMONG 15-24 YEARS			
Interviewer says: "We will now ask you about your experience with HIV prevention program."			
1001	Where can you get condoms? (Select all that apply.)	CLINIC/HOSPITAL = A KIOSK/SHOP = B PHARMACY = C LOCAL FREE DISPENSER = D FRIENDS/PEER = E SEXUAL PARTNER(S) = F COMMUNITY BASED DISTRIBUTION AGENTS (CBDAS) OR HEALTH SURVEILLANCE ASSISTANTS (HSAS) = G MOBILE VANS = H OTHER = X _____ (SPECIFY) DON'T KNOW = -8 REFUSED = -9	
1002	If you wanted a condom, would it be easy for you to get one?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IF YES, DON'T KNOW, REFUSED → 1004
1003	Why is it not easy for you to get a condom?	CONDOMS NOT AVAILABLE/TOO FAR = A NOT CONVENIENT = B COSTS TOO MUCH = C EMBARASSED TO GET CONDOMS = D DO NOT WANT OTHERS TO KNOW = E DO NOT KNOW WHERE TO GET CONDOMS = F COVID-19 PANDEMIC (CORONA) = G OTHER = X _____ (SPECIFY) DON'T KNOW = Y REFUSED = Z	

NO.	QUESTIONS	CODING CATEGORIES	SKIP PATTERNS
MODULE TEN: EXPOSURE TO PREVENTION INTERVENTION AMONG 15-24 YEARS (continued)			
1004	Have you ever talked with a parent or guardian about sex?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
1005	Have you ever discussed HIV with your parents or guardians?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
1006	Have you taken part in any of the following prevention or treatment programs?	YOUTH FRIENDLY HEALTH SERVICES = A SCHOOL-BASED COMPREHENSIVE SEX EDUCATION = B FAMILY PLANNING COUNSELING = C ZATHU LISTENING CLUBS = D GO GIRLS CLUBS (MY DREAMS! MY CHOICE!) = E GRASSROOTS SOCCER = F SINOVUYO = G TEEN CLUB = H AIDS TOTO = I PREP COUNSELING = J IMPOWER = K COACHING BOYS INTO MEN = L NONE = W OTHER = X _____ (SPECIFY) DON'T KNOW = Y REFUSED = Z	
1007	In the past 12 months, how many times have you participated in a school meeting or class period where they talked about HIV/AIDS? If you are not certain, give your best guess.	NONE = 0 1-4 TIMES = 1 5-9 TIMES = 2 10 OR MORE TIMES = 3 DID NOT ATTEND SCHOOL IN THE PAST 12 MONTHS = 4 DON'T KNOW = -8 REFUSED = -9	

Interviewer says: "Thank you for taking the time to participate in this survey. Your responses will be very helpful to the Ministry of Health to better understand how to improve health programs in the country."

PROVIDE PARTICIPANT WITH LIST OF ORGANIZATIONS, IF NOT ALREADY GIVEN.

APPENDIX G SURVEY CONSENT FORMS

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

What language do you prefer for our discussion today?

☐ English ☐ Chichewa ☐ Tumbuka

Title of Study: This study is called the 2020 Malawi Population-Based HIV Impact Assessment (MPHIA 2020)

Interviewer reads:

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

Purpose of study

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

This study will help us know how many people in Malawi have HIV and need health services. We expect about 22,000 men, women, and adolescents 15 years of age or over from 15,000 households throughout Malawi to take part in the study. If you take part, your taking part will help the Ministry of Health improve HIV services in the country.

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

Study Procedures

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

Alternatives to taking part

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

Costs for being in the study

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

Benefits

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

Risks

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

Confidentiality and Access to Your Health Information

We will do everything we can to keep your answers 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 study findings and study data. The data from this study will be released to the public without any identifiers, and this will not require another consent from you. Your name will not be released outside of the study groups listed below unless there is an issue of safety.

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

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

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

[INTERVIEWER: READ FROM HERE]

This study has received approval from the National Health Sciences Research Committee and the Institutional Review Boards of the Centers for Disease Control and Prevention, Columbia University Medical Center, and WESTAT.

Who should you contact if you have questions?

If you would like to have more information about the study, or if you want to talk to someone about injuries or other harm because of participating in this study, you may contact:

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

Dr Rose Nyirenda
Director, Department of HIV/AIDS
Ministry of Health, Malawi
Phone: +265 99 395 311
E-mail: mphia2020@gmail.com

[INTERVIEWER: READ FROM HERE]

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

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

Dr Collins Mitambo
Address: Ministry of Health, National Health Sciences Research Committee
P.O Box 30337, Lilongwe, Malawi
Phone: +2651726422/418
E-mail: cmitambo@gmail.com

Do you want to ask me anything about the study?

Consent Statements

By answering the questions below, you confirm that any questions you had have been answered satisfactorily and you have been offered a copy of this consent form.

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

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

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

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

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

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

[TABLET SUMMARY STATEMENT]

To confirm, you have agreed to [INSERT ALL OPTIONS MARKED YES: HOUSEHOLD INTERVIEW]. Is this correct?
☐ Yes ☐ No

Printed Name of Household Head _____

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

Printed name of person obtaining consent _____

Study staff [ENTER STUDY ACRONYM] ID number _____

INDIVIDUAL CONSENT FOR ADULTS 18+ AND EMANCIPATED MINORS 15-17 YEARS:

[SKIP IF PARTICIPANT ALREADY COMPLETED HOUSEHOLD CONSENT]

What language do you prefer for our discussion today?

☐ English ☐ Chichewa ☐ Tumbuka

Title of Study: This study is called the 2020 Malawi Population-Based HIV Impact Assessment (MPHIA 2020)

Interviewer reads:

Hello. My name is_____. I would like to invite you to take part in this study about HIV in Malawi. The ICAP Malawi and the Ministry of Health are leading this study and are conducting it with the United States Centers for Disease Control and Prevention (CDC), ICAP at Columbia University, WESTAT, and the National Statistics Office (NSO).

Purpose of study

HIV is a virus that causes an illness called AIDS. HIV and AIDS can be treated by taking medicines regularly. This study will help us know how many people in Malawi have HIV and need health services. This study involves an interview, a blood draw, and HIV testing. We expect about 22,000 men, women, and adolescents 15 years of age or older from 15,000 households throughout Malawi to take part in the study. If you take part, your taking part will help the Ministry of Health improve HIV services in the country.

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

Study Procedures

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

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

- If you join this study, we will ask you questions about your age, the work you do, your health and experience with health services, and your social and sexual behavior. The interview will take about 20 to 30 minutes. The interview will take place in a private area in or around your home.
- Study procedures also include a blood draw, HIV testing, and storage of that blood for future testing if you agree to this. The testing and counseling will take about 45 minutes.
    - If you agree to the HIV testing, a study staff member who has been trained to draw blood, will take about 14 milliliters (about a tablespoonful) of blood from your arm into two tubes. If it is not possible to take blood from your arm, then we will try to take a few drops of blood from your finger. The blood test will take place here in or around your household. We will give you the results of your HIV test and provide counseling on the same day.
    - If you have a positive HIV test result, we will give you a referral form and information so you can consult with a doctor or nurse to learn more about the test results.
    - If you test positive for HIV, we will send your blood to a laboratory to measure your viral load and CD4 count. Viral load is the amount of HIV in your blood. CD4 cells are the part of the immune system that fights HIV infection and other diseases. These results will be sent to a health facility of your choosing in about 8 to 12 weeks. You will be able to talk to a nurse or doctor at that facility about your results. Some of your blood will be sent to a laboratory out of the country for additional tests related to HIV. If we have test results that might help guide your treatment we will return them to a clinic. If you have given us your contact information, we will contact you to tell you how you and your doctor or nurse may get these results.
    - We would also like to ask you to allow us to store your leftover blood for future research tests. These tests may be related to HIV or other health issues important to people living in Malawi. This sample will be stored for an indefinite amount of time but your name will be on the sample for only three years. We will attempt to tell you about any test results during the three year period that are important to your health. After the three year period, the sample will not have your name on it, so we will not be able to tell you the results of these future research tests. Your leftover blood will not be sold or used for profit but may be shared with outside investigators after removal of all identifiers, without asking for your consent again. If you do not agree to long-term storage of your blood samples, you can still take part in the study and we will destroy your blood samples after the study testing is complete. If you agree today to store your blood but change your mind later in the next three years, you can call the number provided at the end of this consent form and have your stored specimen destroyed. If you change your mind after three years, once your name is removed from the sample, we will not be able to destroy your sample. Any future studies conducted using your blood sample will be approved by the appropriate institutions overseeing those studies.
- Additionally, you may be eligible to take part in future studies related to health in Malawi. We are asking for your permission to contact you in the next three years if such an opportunity occurs. To do this, approved researchers will be able to request access to your contact information. If they contact you, they will give you details about the new study and invite you to join the study. You may decide at that time that you do not want to take part in that study. If you do not wish to be contacted about future studies, it does not affect your taking part in this study.

[SKIP IF PARTICIPANT ALREADY WENT THROUGH THE HOUSEHOLD CONSENT]

Alternatives to taking part

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

Costs for being in the study

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

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

Benefits

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

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

Risks

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

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

As with all studies, there is a chance that someone could find out you took part in the study. We are doing everything possible to ensure confidentiality and minimize this risk.

[SKIP IF PARTICIPANT ALREADY COMPLETED HOUSEHOLD CONSENT]

Confidentiality and access to your health information

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

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

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

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

[INTERVIEWER: READ FROM HERE]

This study has received approval from the National Health Sciences Research Committee (NHSRC), and the Institutional Review

Boards of the Centers for Disease Control and Prevention, Columbia University Medical Center, and WESTAT.

Who should you contact if you have questions?

If you would like to have more information about the study, or if you want to talk to someone about injuries or other harm because of participating in this study, you may contact:

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

Dr Rose Nyirenda
Director, Department of HIV/AIDS
Ministry of Health, Malawi
Phone: +265 99 395 311
E-mail: mphia2020@gmail.com

[INTERVIEWER: READ FROM HERE]

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

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

Dr Collins Mitambo
Address: Ministry of Health, National Health Sciences Research Committee
P.O Box 30337, Lilongwe, Malawi
Phone: +2651726422/418
E-mail: cmitambo@gmail.com

[READ FROM HERE IF PARTICIPANT ALREADY COMPLETED HOUSEHOLD CONSENT]

Do you want to ask me anything about the study?

Consent Statement

By answering the questions below, you confirm that any questions you had have been answered satisfactorily and you have been offered a copy of this consent form.

1. Do you agree to take part in the individual interview? If you agree to take part in the individual interview, please state the following statement:

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

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

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

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

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

[IF PARTICIPANT DOES **NOT** AGREE, THEN STOP]

2. Do you agree to give blood for testing, including HIV testing and related testing, and receiving the results of your HIV test? If you agree to give blood for HIV testing, related testing and receiving your HIV test result, then please state the following statement:

"I agree to give blood for HIV testing and related testing and to receive my HIV test result."

☐ Check this box if participant agreed to blood testing and related testing.

If you refuse to give blood for HIV and related testing or refuse to receive your HIV test result, please state the following statement:

"I do not wish to take part in blood testing today."

☐ Check this box if participant refuses blood testing, related testing or refuses to receive their HIV test result.

[IF PARTICIPANT DOES **NOT** AGREE, THEN GO TO #4 - CONTACT FOR FUTURE RESEARCH]

3. Do you agree to have your blood stored for future research? If you agree to have your leftover blood stored for future research, please state the following statement.

"I agree to have my leftover blood stored for future research."

☐ Check this box if participant agrees to have his/her leftover blood stored for future research

If you refuse to have your blood stored for future research, please state the following statement:

"I do not wish to have my leftover blood stored for future research."

☐ Check this box if participant refuses to have his/her leftover blood stored for future research

4. Do you agree to be contacted for future research? If you agree to be contacted for future research, please state the following statement:

"I agree to be contacted for future research."

☐ Check this box if participant refuses be contacted for future research.

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

[TABLET SUMMARY STATEMENT]

To confirm, you have agreed to <INSERT ALL OPTIONS MARKED YES: INTERVIEW, FUTURE RESEARCH, BLOOD TESTING AND RECEIVING HIV TEST RESULT, BLOOD STORAGE>, is this correct?

☐ Yes ☐ No

Printed name of participant _____

Signature of person obtaining consent (i.e. Interviewer) _____ Date: ___/___/___

Printed name of person obtaining consent _____

Study staff [ENTER STUDY ACRONYM] ID number _____

PARENTAL OR GUARDIAN PERMISSION FOR PARTICIPANTS 15-17 YEARS

What language do you prefer for our discussion today?

☐ English ☐ Chichewa ☐ Tumbuka

Title of Study: This study is called the 2020 Malawi Population-Based HIV Impact Assessment (MPHIA 2020)

Interviewer reads:

Hello. My name is_____. I would like to invite your child, who is between 15-17 years of age, to take part in this study about HIV in Malawi. The Ministry of Health is leading this study and is conducting it with the United States Centers for Disease Control and Prevention (CDC), ICAP at Columbia University, WESTAT, and the National Statistics Office (NSO).

[SKIP IF PARTICIPANT ALREADY COMPLETED THE HOUSEHOLD OR INTERVIEW CONSENT]

Purpose of study

HIV is a virus that causes an illness called AIDS. HIV and AIDS can be treated by taking medicines regularly. This study will help us know how many people in Malawi have HIV and need health services. This study involves an interview, blood draw, and HIV testing. We expect about 22,000 men, women, and minors 15 years of age or older from 15,000 households throughout Malawi to take part in the study.

If your child takes part, they will help the Ministry of Health improve HIV services in the country.

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

Study Procedures

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

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

- If both you and your child agree, we will ask your child some questions about what kind of work your child does, whether your child had any experience with health services, and your child's social and sexual behaviors. The interview questions we will ask your child are the same as the ones that we will ask adults who agree to take part in the study. Your child's answers will not be shared with you. The interview will take about 20 to 30 minutes. The interview will be conducted in private with only the child and a study staff member.
- Study procedures also include blood draw, HIV testing, and storage of that blood for future testing. The testing and counseling will take about 45 minutes.
- A study staff member, who has been trained to draw blood, will take about 14 milliliters (about a tablespoonful) of blood from your child's arm into two tubes. 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 test for HIV in your home. We will give your child his/her results from these tests and provide counseling about the results on the same day as the test.
- For all children who test positive for HIV, we will also send their blood to a laboratory to measure the viral load and CD4 count. Viral load is the amount of HIV in the blood. CD4 cells are the part of the immune system that fights HIV infection and other diseases. If the child provides us with the name of a health facility, we can send their viral load and CD4 results there in about 8 to 12 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. If we have test results that might guide your child's care or treatment we will return them to a clinic. If the child provides us with their contact information, we will contact him/her about how the child and a doctor or nurse at the preferred health facility may get these results.
- We will help your child access the healthcare that he or she needs. If your child tests HIV positive, and with your child's consent, we will provide your child's contact information and HIV results to healthcare workers or counselors from a trained social service organization. Specifically, we will provide your child's name, phone number (if provided to us) and address to the healthcare workers or counselors. These counselors and healthcare workers will contact your child, talk to him or her about HIV, and help your child go for HIV care. Anyone who is provided with your child's details will be experienced in providing support to people living with HIV and will be trained in maintaining confidentiality.
- Additionally, 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 Malawi. This sample will be stored for an indefinite amount of time but the name of your child will be on the sample for only three years. We will attempt to tell your child about any test results during the three year period that are important to your child's health. After the three year period, 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 profit but may be shared with outside investigators after removal of all identifiers, without asking for your permission again. If you do not agree to long term storage of your child's blood samples, your child can still take part in the study, and we will destroy your child's blood samples after study-related testing is complete. If you agree today to storage of your child's blood but change your mind later in the next three years, you can call the number

provided at the end of this consent form and have your child's stored specimen destroyed. If you change your mind after three years, once your child's name is removed from the sample, we will not be able to destroy your child's sample. Any future studies conducted using your child's blood sample will be approved by the appropriate institutions overseeing those studies.

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

Alternatives to taking part

Your child can decide not to take part in this study. If your child chooses to take part in the study, they may change their mind at any time and stop taking part. If the child decides not to take part, it will not affect their health care in any way. We can tell your child where to go for HIV services and learn about their HIV status. If the child decides to leave the study, no more information will be collected from him/her. However, your child will not be able to take back the information that has already been collected and shared.

Costs for being in the study

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

Benefits

The main benefit for your child to be in the study is the chance to learn more about their health today. If your child tests HIV positive, the benefit is that your child will learn where to go for HIV services. HIV care and treatment provided by the Ministry of Health is free. If you or your child already know they have HIV and is not on treatment, you or your child will get information to help their doctor or nurse determine if your child is ready to start treatment. If you or your child already know that they are HIV positive and on HIV treatment, the viral load tests can help your child's nurse or doctor judge how well the treatment is working. If your child tests HIV negative, you or your child will learn about how they can stay HIV negative.

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

Risks

The risks involved with taking part in the study are small. Your child may feel uncomfortable answering some of the questions. Your child does not have to answer questions they feel are too personal or that make him/her feel uncomfortable.

The risks to your child from having their blood drawn are also minor. They include brief pain from the needle stick, bruising, lightheadedness, bleeding, and rarely, infection where the needle enters the skin. The study staff member who will take their blood has received training on how to draw blood. If they have any discomfort or any of the symptoms we've mentioned above, please let us know, and especially if there is any bleeding or swelling.

Your child may learn that they are HIV positive. Learning that they have HIV may cause some emotional distress. If they tests positive for HIV, the child will receive counseling on how to cope with learning that they has HIV. We will help your child identify where to go and explain the options available for care and treatment. Care and treatment is available at government facilities free of charge.

As with all studies, there is a chance that someone could find out you took part in the study. We are doing everything possible to ensure confidentiality and minimize this risk.

Confidentiality and access to your health information

We will do everything we can to keep your child's taking part in the study and their answers private. The information we collect from your child will be identified by a number and not by their name. The information entered into the tablet will be identified only by the number. Your child's name will not appear when we share study results and study data. The data from this study will be released to the public without any identifiers, and this will not require another permission from you. Your child's name will not be released outside of the study groups listed below unless there is an issue of safety.

[SKIP IF PARTICIPANT ALREADY COMPLETED THE HOUSEHOLD OR INTERVIEW CONSENT]

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

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

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

[INTERVIEWER: READ FROM HERE]

This study has received approval from the National Health Sciences Research Committee, and the Institutional Review Boards of the Centers for Disease Control and Prevention, Columbia University Medical Center, and WESTAT.

Dr Rose Nyirenda
Director, Department of HIV/AIDS
Ministry of Health, Malawi
Phone: +265 99 395 311
Email: mphia2020@gmail.com

[INTERVIEWER: READ FROM HERE]

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

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

Dr. Collins Mitambo
Address: Ministry of Health, National Health Sciences Research Committee
P.O Box 30337, Lilongwe, Malawi
Phone: +2651726422/418
E-mail: cmitambo@gmail.com

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

Do you want to ask me anything about the study?

- The interview?
- Drawing blood for HIV testing?
- Testing in the laboratory?
- Storage of blood for future research testing?

Consent Statement

By answering the questions below you confirm that any questions you had have been answered satisfactorily and you have been offered a copy of this consent form.

1. Do you agree that we can ask this child to do the interview? If you agree for us to ask this child to do the interview, please state the following statement:

"I give permission to the study team to ask this child to take part in the interview."

☐ Check this box if parent/guardian agrees to allow us to ask this child to take part in the interview

If you refuse for us to ask your child to do interview, please state the following statement:

"I do not wish for the study team to ask this child to take part in the interview."

☐ Check this box if parent/guardian refuses to allow the study team to ask this child to take part in the interview

[IF PARTICIPANT DOES **NOT** AGREE, THEN STOP]

2. Do you agree that we can approach this child to give blood for HIV testing, related testing as well as to give them their HIV test result?

If you agree for us to ask this child to give blood for HIV testing and related testing, please state the following statement:

"I give permission for the study team to ask this child to give blood for HIV testing, related testing and to give them their HIV test results."

☐ Check this box if parent/guardian agrees for study team to ask this child to take part in the blood draw, HIV testing and return of the HIV test result to them.

If you do not agree for us to ask your child to give blood for HIV testing, and related testing and return of their HIV test result to them, then, please state the following statement:

"I do not wish for the study team to ask this child to take part in blood testing today."

☐ Check this box if parent/guardian refuses to allow the study team to ask this child to take part in the blood draw

[IF PARTICIPANT DOES **NOT** AGREE, THEN GO TO #4 – CONTACT FOR FUTURE RESEARCH]

3. Do you agree to allow us to ask this child to have their leftover blood stored for future research?

If you agree for us to ask this child to have their leftover blood stored for future research, please state the following statement:

"I give permission for the study team to ask this child to have their leftover blood stored for future research."

☐ Check this box if parent/guardian agrees for study team to ask this child to have their leftover blood stored for future research.

If you refuse for the study team to ask this child to have their leftover blood stored for future research, please state the following statement:

"I do not wish for the study team to ask this child to have their leftover blood stored for future research."

☐ Check this box if parent/guardian refuses to have study team ask this child to have their leftover blood stored for future research.

4. Do you agree for us to ask this child to be contacted for future research?

If you agree for us to ask this child to retain their contact information for future research, please state the following statement:

"I give permission to the study team to ask this child to be contacted for future research."

☐ Check this box if parent/guardian agrees to allow us to ask this child to be contacted for future research.

If you refuse for us to ask this child if they are willing to be contacted for future research, please state the following statement:

"I do not want the study team to ask this child if they want to be contacted for future research."

☐ Check this box if parent/guardian refuses to allow the study team to ask this child if they want to be contacted for future research.

[TABLET SUMMARY STATEMENT]

To confirm, you have agreed to <INSERT ALL OPTIONS MARKED YES: APPROACH CHILD FOR INTERVIEW, APPROACH CHILD FOR FUTURE RESEARCH, APPROACH CHILD FOR BLOOD TESTNG, APPROACH CHILD TO SHARE CONTACT INFORMATION, AND APPROACH CHILD FOR BLOOD STORAGE>, is this correct?

☐ Yes ☐ No

Printed name of parent/guardian _____

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

Printed name of person obtaining consent _____

Survey staff ID number _____

Child's name (print) _____

INDIVIDUAL ASSENT FOR PARTICIPANTS 15-17 YEARS

What language do you prefer for our discussion today?

☐ English ☐ Chichewa ☐ Tumbuka

Title of Study: This study is called the 2020 Malawi Population-Based HIV Impact Assessment (MPHIA 2020)

Interviewer reads:

Hello. My name is_____. I would like to invite you to take part in a study. As a part of this study, we are asking people questions about themselves and also giving people a chance to learn if they have HIV. We are also asking people if we can keep some of their blood for future testing.

This form talks about our study and the choice that you have to take part in it. You can ask questions any time.

Why are we doing this study?

HIV is a virus. Being infected with HIV can lead to an illness often called AIDS. HIV and AIDS can be treated by taking medicines regularly. This study will help us know how many people in [ENTER DISTRICT] have HIV and need health services. This study involves an interview, blood draw, and HIV testing.

Your parent/guardian said it was okay for us to ask you to join.

This form might have some words that you may not have heard before. Please ask me to explain anything that you do not understand.

What would happen if you join this study?

If you decide to join the study, here is what would happen:

- If you join this study, we will ask you questions We will ask you questions about your age, the work you do, your health and experience with health services, and your social and sexual behavior.

- The interview will take about 20 to 30 minutes.
- The interview will take place in private here in your house or a nearby area around your house.
- After we ask you the questions, if you agree, we will take some of your blood to test for HIV.
- We will use a needle to take about 14 milliliters (about a tablespoonful) of blood from your arm into two tubes. If it is not possible to take blood from your arm, then we will try to take a few drops of blood from your finger.
- It will take about 45 minutes to do the test and to talk to you about the results.
- If you test positive for HIV: 1
    - We will send your blood to a laboratory to measure your viral load and CD4 count. Viral load is the amount of HIV in your blood. CD4 cells are the part of the immune system that fights HIV infection and other diseases.
    - We will send your viral load and CD4 test results to a health facility of your choice in about 8 to 12 weeks. At the health facility you will be able to talk to a nurse or doctor about your results.
    - Some of your blood will be sent to a laboratory out of the country for additional tests related to HIV. If we have test results that might help guide your treatment, we will return them to a clinic. If you have given us your contact information, we will contact you to tell you how you and your doctor or nurse may get these results.
- You may be eligible to take part in future studies related to health in [MALAWI]. We are asking for your permission to contact you in the next three years if such an opportunity occurs. To do this, approved researchers will be able to request access to your contact information. If they contact you, they will give you details about the new study and invite you to join the study. You may decide at that time that you do not want to take part in that study. If you do not wish to be contacted about future studies, it does not affect your taking part in this study.
- We will ask you if we can store some of your blood for future testing. These tests will help us learn about the health of people in Malawi. This sample will be stored forever but your name will be on the sample only for three years. We will try to tell you about any test results during the next three years that are important for your health. After the three years, the sample will not have your name on it and we will not be able to tell you the results of any future tests. Your leftover blood will not be used for anything other than these tests. Your blood will not be sold. After removing your personal information, the results of these tests may be shared with people outside the study, without asking for your permission again. If you do not agree to future storage and testing of your blood, we will destroy your blood after study-related testing has finished and you can still receive your test results and conduct the study interview. If you agree today to store your blood but change your mind later in the next three years, you can call the number provided at the end of this consent form to have your stored specimen destroyed. If you change your mind after three years, once your name is removed from the sample, we will not be able to destroy your sample. Any future tests done with your blood sample will be approved by the appropriate institutions overseeing those studies.

Alternatives to taking part

You can leave the study at any time for any reason. We can tell you where to go for HIV services and learn about your HIV status. If you decide to leave the study, no more information will be collected from you. However, you will not be able to take back the information that has already been collected and shared. If you decide to leave the study and request for HIV testing, survey staff will give you a written referral to a health facility of your choice where you can go to get this service.

Costs for being in the study

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

Could the study help me?

Being in the study may help you by learning whether or not you have HIV. We will give you the results of your HIV test and provide counseling to you. We will discuss with you how to share these results with your parent/guardian, if you decide to do so. If you test positive for HIV, you will learn about it and where to go for care and treatment of HIV. Care and treatment provided by the Government of Malawi is free. Your taking part in this study will help us learn more about HIV in Malawi.

Could bad things happen if you join this study?

You may feel uncomfortable answering some of the questions we will ask. You can refuse to answer any question at any time and you can stop the interview at any time.

The needle may hurt when it is put into your arm. This pain will go away quickly. Sometimes the needle can leave a bruise on the skin. You might bleed a little or feel a little dizzy. Rarely, an infection might occur where the needle enters the skin. We will do our best to make it as painless as possible.

You may learn that you have HIV. Learning that you have HIV may cause you to feel worried. We will talk to help you find a clinic where you can receive treatment.

We will not tell anyone else what we talk about, but there is a small chance other people might find out. We will do everything we can to minimize this risk.

What else should you know about this study?

If you don't want to be in the study, you don't have to be. Nobody will get upset with you if you do not want to join the study.

It is also OK to say 'Yes' and change your mind later. You can stop being in the study at any time. If you want to stop, please tell us.

Confidentiality and Access to Your Health Information

We will do everything we can to keep your 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 study and people you may decide to tell. The data from this study will be released to the public without any identifiers, and this will not require another consent from you.

Your name will not be released outside of the study groups listed below unless there is an issue of safety. The following individuals and/or agencies will be able to look at your interview records to help oversee the conduct of this study:

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

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

[INTERVIEWER: READ FROM HERE]

This study has received approval from the National Health Sciences Research Committee, and the Institutional Review Boards of the Centers for Disease Control and Prevention, Columbia University Medical Center, and WESTAT.

Whom should you contact if you have questions?

If you would like to have more information about the study, or if you want to talk to someone about injuries or other harm because of participating in this study, you may contact:

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

Dr Rose Nyirenda
Director, Department of HIV/AIDS
Ministry of Health, Malawi
Phone: +265 99 395 311
E-mail: mphia2020@gmail.com

[INTERVIEWER: READ FROM HERE]

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

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

Dr Collins Mitambo
Address: Ministry of Health, National Health Sciences Research Committee
P.O Box 30337, Lilongwe, Malawi
Phone: +2651726422/418
E-mail: cmitambo@gmail.com

Do you want to ask me anything about:

- The interview?
- Testing in the laboratory?
- Storage of blood for future research testing?

Consent Statement

By answering the questions below you confirm that any questions you had have been answered satisfactorily and you have been offered a copy of this consent form.

1. Do you agree to take part in the individual interview? If you agree to take part in the individual interview, please state the following statement:

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

☐ Check this box if participant agrees to participate in the individual interview

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

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

☐ Check this box if participant refuses to participate in the individual interview

[IF PARTICIPANT DOES **NOT** AGREE, THEN STOP]

2. Do you agree to give blood for testing? If you agree to give blood for HIV testing, related testing and to receive your HIV test result, please state the following statement:

"I agree to give blood for HIV testing, related testing and to receive my HIV test result."

☐ Check this box if participant agreed to blood testing, related testing and to receive their HIV test result.

If you refuse to give blood for HIV, related testing and to receive my HIV test result, please state the following statement:

"I do not wish to take part in blood testing today."

☐ Check this box if participant refuses blood testing, related testing and to receive their HIV test result.

[IF PARTICIPANT DOES **NOT** AGREE, THEN GO TO #4 – CONTACT FOR FUTURE RESEARCH]

3. Do you agree to have your blood stored for future research? If you agree to have your leftover blood stored for future research, please state the following statement.

"I agree to have my leftover blood stored for future research."

☐ Check this box if participant agrees to have his/her leftover blood stored for future research

If you refuse to have your blood stored for future research, please state the following statement:

"I do not wish to have my leftover blood stored for future research."

☐ Check this box if participant refuses to have his/her leftover blood stored for future research

4. Do you agree to be contacted for future research? If you agree to be contacted for future research, please state the following statement:

"I agree to be contacted for future research."

☐ Check this box if participant agreed to be contacted for future research.

If you refuse to be contacted for future research, please state the following statement:

"I do not wish to be contacted for future research."

☐ Check this box if participant refuses be contacted for future research.

[TABLET SUMMARY STATEMENT]

To confirm, you have agreed to <INSERT ALL OPTIONS MARKED YES: INTERVIEW, FUTURE RESEARCH, BLOOD TESTING, BLOOD STORAGE>, is this correct?

☐ Yes ☐ No

Printed name of adolescent _____

Printed name of parent/guardian _____

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

Printed name of person obtaining assent _____

Study staff ID number _____

CONSENT/ASSENT TO SHARE CONTACT INFORMATION FOR ACTIVE LINKAGE TO CARE OF MPHIA 2020 PARTICIPANTS, 15+ YEARS

What language do you prefer for our discussion today?

☐ English ☐ Chichewa ☐ Tumbuka

Title of Study: This study is called the 2020 Malawi Population-Based HIV Impact Assessment (MPHIA 2020)

Interviewer reads:

Purpose of consent

You had a positive HIV test today. We have provided you with counselling regarding the results. We have also provided a referral form to bring to a health clinic and seek HIV treatment and care. We would like to help you in accessing the healthcare that you need. Your viral load and CD4 results will be returned to a clinic of your choice. If you agree, we will include your name and age when we share those results with your preferred health facility. This counselor may contact you to talk to you about HIV and help you go for HIV care. Anyone who is provided with your details will be experienced in providing support to people living with HIV and will be trained in maintaining confidentiality.

What do you have to do if you agree to take part?

If you agree for your information to be shared and to be contacted, we may share your name, phone number (if you provided it to us), and your address to those providers and organizations to provide you with support. The provider of care may contact you by SMS, phone, WhatsApp or in person.

What about confidentiality?

Your HIV test results and your contact information will not be shared with any other parties aside from those specified in this and other consent forms, and with this support organization. They will also do their utmost to maintain your confidentiality. However, we cannot guarantee complete confidentiality.

What are the potential risks?

As with all studies, there is a chance that confidentiality could be compromised. We are doing everything we can to minimize this risk.

What are the potential benefits?

A healthcare worker or counselor will assist you in accessing the healthcare that you need.

Whom should you contact if you have questions?

If you would like to have more information about the study, or if you want to talk to someone about injuries or other harm related to participating in this study, you may contact:

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

Dr Rose Nyirenda
Director, Department of HIV/AIDS
Ministry of Health, Malawi
Phone: +265 99 395 311
E-mail: mphia2020@gmail.com

[INTERVIEWER: READ FROM HERE]

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

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

Dr. Collins Mitambo
Address: Ministry of Health, National Health Sciences Research Committee
P.O Box 30337, Lilongwe, Malawi
Phone: +2651726422/418
E-mail: cmitambo@gmail.com

Do you want to ask me anything about the study?

Consent Statement

By answering the questions below, you confirm that any questions you had have been answered satisfactorily and you have been offered a copy of this consent form.

Returning these results with your name and age will make it easier for the clinic to return the results to you. Do you agree for the results of your CD4 and viral load testing to be returned to the clinic accompanied by your name and age? If you do not agree the results will be returned to the clinic with your participant ID, a random unique survey number linking you to your results.

1. If you agree to allow us to include your name and age when returning your CD4 and viral load testing results, please state the following statement:

"I give permission for the survey team to include my name and age when returning my CD4 and viral load testing results to my preferred health facility."

☐ Check this box if participant agrees to have his or her viral load and CD4 testing results returned with his or her name and age

If you refuse to have your name and age included when returning your viral load and CD4 results, please state the following statement:

"I do not wish for the study team to include my name and age when returning my CD4 and viral load results to my preferred health facility."

☐ Check this box if participant refuses to have his or her viral load and CD4 testing results returned with his or her name.

2. Do you agree to allow the study team to share your contact information with a trained healthcare workers or counselors?

If you agree to share your contact information with a trained healthcare worker or counselor, please state the following statement:

"I give permission for the study team to share my contact information"

☐ Check this box if participant agrees to share his/her contact information

If you refuse to share your contact information, please state the following statement:

"I do not wish for the study team to share my contact information."

☐ Check this box if participant refuses to share his/her contact information

[IF PARTICIPANT DOES **NOT** AGREE, THEN STOP]

3. Do you agree to be contacted by?

SMS _____Yes _____No

WhatsApp _____Yes _____No

Phone call _____Yes _____No

In person _____Yes _____No

[TABLET SUMMARY STATEMENT]

To confirm, you have agreed to <INSERT ALL OPTIONS MARKED YES: RETURN RESULTS WITH NAME AND AGE, SHARE, SMS, WHATSAPP, PHONE, IN-PERSON>, is this correct?

☐ Yes ☐ No

Printed name of participant _____

Signature of person obtaining assent/consent _____ Date: ___/___/___

Printed name of person obtaining assent/consent _____

Study staff ID number _____

Malawi Population-based HIV Impact Assessment 2020-2021 (MPHIA 2020-2021 2020-2021)

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