MALAWI POPULATION-BASED HIV IMPACT ASSESSMENT

MPHIA 2015-2016

FINAL REPORT

OCTOBER 2018

Malawi Population-based HIV Impact Assessment (MPHIA) 2015-2016

MPHIA 2015-2016 Collaborating Institutions

Ministry of Health, Malawi
The United States President's Emergency Plan for AIDS Relief (PEPFAR)
The United States Centers for Disease Control and Prevention (CDC)
Centre for Social Research (CSR), Chancellor College, University of Malawi
National AIDS Commission, Malawi
National Statistical Office, Malawi
College of Medicine - Johns Hopkins Project
The Joint United Nations Programme on HIV/AIDS (UNAIDS), Malawi
Riders for Health, Malawi
Statistical Center for HIV/AIDS Research and Prevention (SCHARP)
WESTAT
ICAP at Columbia University

Donor Support and Disclaimer

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

Suggested Citation

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

Access This Report Online

The PHIA Project: http://phia.icap.columbia.edu

Contact Information

Permanent Secretary
Ministry of Health
P.O. Box 30377
Lilongwe
Malawi

CONTENTS

GLOSSARY OF TERMS

90-90-90: These are ambitious global program targets proposed by the Joint United Nations Programme on HIV/AIDS (UNAIDS) and adopted by each country to help end the Acquired Immunodeficiency Syndrome (AIDS) epidemic. By 2020, 90% of all people living with HIV (Human Immunodeficiency Virus) (PLHIV) will know their HIV status; 90% of all people with diagnosed HIV infection will receive sustained antiretroviral therapy (ART); and 90% of all people receiving ART will have viral load (VL) suppression (VLS).

Acquired Immunodeficiency Syndrome (AIDS): AIDS is a disease caused by infection with HIV. AIDS results in severe damage to the immune system, leaving the body vulnerable to life-threatening conditions, such as infections and tumors.

Antiretroviral Therapy (ART): Treatment with antiretroviral (ARV) drugs that inhibit the ability of HIV to multiply in the body, leading to improved health and survival among HIV-positive persons.

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 and can be used to determine the need for and response to ART.

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

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

Head of Household: The person who is recognized within the household as being the head and is age 18 years and older or is considered an emancipated minor (less than the age of 18 years who is married or is free from any legally competent representative 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 the HIV-positive person vulnerable to illnesses that would have otherwise been eliminated by a healthy immune system.

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

HIV Prevalence: The proportion of living persons in a population who are living with HIV at a specific point in time. The denominator is the total population; the numerator is the number of persons living with HIV.

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

HIV Viral Load Suppression: An HIV VL 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. In order to give informed consent, the individual concerned must have adequate reasoning faculties and be in possession of all relevant facts at the time he or she gives consent.

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 infection through heterosexual intercourse. Voluntary medical male circumcision (VMMC) is an important part of national HIV prevention programs in most HIV high burden countries.

Prevention of mother-to-child-transmission (PMTCT): Mother-to-child transmission (MTCT) is when an HIV-positive woman passes the HIV virus to her baby during pregnancy, labor, delivery or while breastfeeding. The United Nations recommends effective PMTCT to include a four-fold approach: (1) primary prevention of HIV infection among women of childbearing age; (2) preventing unintended pregnancies among women living with HIV; (3) preventing HIV transmission from women living with HIV to their infants; and (4) providing appropriate treatment, care, and support to mothers living with HIV, their children, and families.

Sexually transmitted infections (STI): STIs are infections transmitted through person-to-person sexual contact. They are sometimes called sexually transmitted diseases (STDs).

Syphilis: Syphilis is a curable STI caused by a bacterium, *Treponema pallidum*. Pregnant women can transmit syphilis to their fetuses.

Tuberculosis: Tuberculosis (TB) is a contagious bacterial disease that spreads through the air and is a leading cause of death among PLHIV in Africa.

List of Abbreviations

AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
ART	Antiretroviral Therapy
ARV	Antiretroviral
CDC	U.S. Centers for Disease Control and Prevention
CD4	CD4+ T-Cell
CI	Confidence Interval
COM-JHP	College of Medicine-Johns Hopkins Project
CSR	Centre for Social Research
DBS	Dried Blood Spot
EA	Enumeration Area
HBTC	Home-Based HIV Testing and Counselling
HIV	Human Immunodeficiency Virus
HPV	Human Papillomavirus
ID	Identification Number
IPV	Intimate Partner Violence
LAg	Limiting Antigen
ml	Milliliters
µl	Microliters
MOH	Ministry of Health
MOS	Measure of Size
MPHIA	Malawi Population-Based HIV Impact Assessment
MTCT	Mother-to-Child Transmission
NNRTI	Non-Nucleoside Reverse Transcriptase Inhibitors
NRTI	Nucleoside Reverse Transcriptase Inhibitors
NSO	National Statistical Office
ODn	Normalized Optical Density
PCR	Polymerase Chain Reaction
PEPFAR	U.S. President's Emergency Plan for AIDS Relief
PFR	Proportion False Recent
PHIA	Population-Based HIV Impact Assessment
PLHIV	People Living with HIV
PMTCT	Prevention of Mother-to-Child Transmission of HIV
POC	Point of Care

RNA	Ribonucleic acid
RR	Response Rate
RT-PCR	Reverse Transcription Polymerase Chain Reaction
QA	Quality Assurance
QC	Quality Control
SMS	Short Message Service
STI	Sexually Transmitted Infection
TB	Tuberculosis
TNA	Total Nucleic Acid
UEW	Unequal Weighting
UNAIDS	Joint United Nations Programme on HIV / AIDS
VL	Viral Load
VLS	Viral Load Suppression
VMMC	Voluntary Medical Male Circumcision

List of Tables and Figures

FOREWORD

We are pleased to present the results from Malawi Population-based HIV Impact Assessment (MPHIA) 2015-2016, the first national survey to provide comprehensive information on important HIV/AIDS indicators at national and zonal levels and measure progress toward the UNAIDS 90-90-90 targets. This survey included a nationally representative sample of over 11,000 households throughout Malawi. It described demographic characteristics of respondents, including reproductive history, PMTCT, male circumcision, HIV/AIDS knowledge and attitudes, HIV testing and awareness of HIV status, care and treatment status, TB, STI, cervical cancer, and intimate partner violence. MPHIA also collected information about HIV testing and treatment in children. Through blood tests, it measured national HIV incidence, VLS in adults, and HIV prevalence in adults and children.

This survey has come at the right time as the global HIV prevention and treatment community is focusing on epidemic control. These data facilitate better monitoring of HIV programs; understanding of which sub-populations are still unaware of their HIV status; and measure progress toward population VLS at a sub-national level. Both the biological and behavioral data from MPHIA allow program planners to target the right populations with tailored interventions and enable policy makers to appropriately improve service delivery models.

The MPHIA was led by the Government of Malawi through the Ministry of Health (MOH), conducted with funding from the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) and technical assistance through the U.S. Centers for Disease Control and Prevention (CDC). This survey was implemented from November 2015 to August 2016 by ICAP at Columbia University in collaboration with local partners, including the Centre for Social Research (CSR) at the University of Malawi, the National Statistical Office (NSO), and the College of Medicine-Johns Hopkins Project (COM-JHP) at the University of Malawi.

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 are especially grateful to our field staff and the respondents, who graciously provided their time and data for the benefit of the nation.

Hon. Atupele Muluzi, MP
Minister of Health and Population

EXECUTIVE SUMMARY

Malawi Population-based HIV Impact Assessment (MPHIA) 2015-2016 was a nationally representative, cross-sectional, population-based survey of households across Malawi. It focused on measuring key biological endpoints to provide direct estimates of HIV infection risk and burden, and on the effectiveness and population-level impact of the HIV-related prevention, care, and treatment interventions implemented in the country. Its primary objectives were to estimate the national-level annual HIV incidence among adults ages 15-64 years, and the subnational prevalence of HIV VLS among HIV-positive adults. In addition, MPHIA measured national and subnational adult HIV prevalence, CD4 counts, ARVs in blood, transmitted HIV drug resistance, pediatric HIV prevalence, and progress toward the UNAIDS 90-90-90 targets defined by UNAIDS. The MPHIA is the first national survey to conduct these measurements in Malawi. The survey also collected information on behaviors associated with HIV acquisition and transmission, common HIV co-morbidities, and other health conditions.

The survey used a two-stage, stratified cluster sample design, in which census EA (clusters) were selected in the first stage and households in the second stage. The sample was stratified by seven geographical zones: North, Central-East, Central-West, Lilongwe City, South-East, South-West, and Blantyre City. Data collection was conducted between the end of November 2015 and August 2016. The survey interviewed 11,386 households. In the households surveyed, 22,405 adults ages 15-64 years and 9,993 children ages 0-14 years were eligible to participate in the survey. Altogether, 88% (19,652) of eligible adults were interviewed, and 87% (17,187) of interviewed adults and 62% (6,166) of eligible children provided blood for biomarkers assessment to determine HIV status. The MPHIA provided home-based HIV testing and counseling (HBTC) with return of results, and point of care (POC) CD4 count for those who were HIV positive. HIV VL results and early infant diagnosis (EID) results were returned to participants through health facilities of their choice. The MPHIA provides weighted estimates. Analysis weights account for sample selection probabilities and are adjusted for nonresponse and noncoverage. The key findings of MPHIA are:

- Annual incidence (adjusted for ARV detection) of HIV infection among adults ages 15-64 years was 0.37% (95% confidence interval (CI): 0.20%-0.54%) which corresponds to approximately 28,000 new cases of HIV infection among adults in the country every year.
- HIV prevalence among adults ages 15-64 years was 10.6%: 12.5% among females and 8.5% among males. Prevalence varied across the seven zones, ranging from 4.9% in the Central-East zone to 17.7% in Blantyre City. HIV prevalence among adults ages 15-49 years was 10.0%.
- Nearly one in five households in Malawi is HIV-affected. Approximately twice the percentage of female-headed households have a head of the household who is living with HIV as compared to male-headed households (21.3% of female household heads were HIV-positive in contrast to 12.2% of male household heads).
- Malawi has made substantial progress toward the achievement of the UNAIDS 90-90-90 targets in adults. Based on self-report and ARV detection data, it is estimated that among adults ages 15-64 years living with HIV, 76.8% were aware of their HIV-positive status, 91.4% of those aware of their status were receiving ART, and 91.3% of those on ART were virally suppressed. The achievement was lower among young people ages 15-24 years, of whom 53.7% were aware of their status, 85.7% of those aware of their status were receiving ART, and 81.2% of those on ART were virally suppressed.

- Among HIV-positive males ages 15-64 years, 39.6% of those residing in urban areas reported no awareness of their HIV status, compared to 29.2% reporting no awareness among those in rural areas. Among HIV-positive females ages 15-64 years, 25.7% and 23.6% of those residing in urban and rural areas, respectively, reported no awareness of their HIV status.
- Concordance between self-report of ART and detection of ARVs was high among HIV-positive individuals ages 15-64 years, with 96.4% of those who reported current ART use having detectable ARVs in blood. However, self-report of HIV diagnosis was less accurate, with 14.8% of those who reported that they had not been previously diagnosed with HIV having ARVs detected in blood.
- The overall prevalence of VLS (defined as HIV ribonucleic acid [RNA] less than 1,000 copies/ ml among adults ages 15-64 years living with HIV was 68.3%, higher among females (73.1%) than among males (60.9%). There is considerable geographical variation in the prevalence of VLS ranging from 59.5% in Blantyre City to 70.7% in the South-East zone.
- Severe immunosuppression was prevalent among those living with HIV who had not been diagnosed: 16.8% of males and 17.7% of females unaware of their HIV-positive status had CD4 counts of less than 200 cells/microliter (µl).
- HIV prevalence among children ages 0-14 years was 1.5%. Progress toward the achievement of the UNAIDS 90-90-90 targets in children is insufficient. Based on parents' report and ARV detection data, it is estimated that among children ages 0-14 years living with HIV, 69.3% had been diagnosed, 86.1% of those diagnosed were receiving ART, and 57.9% of those on ART were virally suppressed.
- Among those women ages 15-49 years who gave birth within the year preceding the survey, 97.2% knew their HIV status, and among those who were HIV-positive, 97.9% reported to have received ARVs (40.3% were newly initiated on ARVs during pregnancy or labor and delivery, while 57.7% were already taking ARVs at the time of their first ANC visit for the pregnancy), which indicates high coverage of ART provision for PMTCT.
- Among children born to HIV-positive mothers ages 15-49 years who gave birth during the three years preceding the survey, 49.4% received an infant HIV test before the age of two months, and 29.3% received an HIV test between ages 2-12 months, according to mothers' report.
- Among infants under the age of 18 months born to HIV-positive women ages 15-49 years, 3.0% were confirmed to be HIV-positive, based on virological testing.
- Among adolescents and young adults ages 15-24 years, only 47.0% have correct knowledge about HIV transmission and prevention of sexual transmission of HIV.
- Among adults ages 15-64 years, condom use was infrequent. Among males, condom use at last sexual intercourse in the 12 months preceding the survey was reported by 34.4% of those who were HIV positive who self-reported to be on ART, 20.6% of those who were HIV-positive but unaware of their status, and 18.9% of those who were HIV-negative. Furthermore, only 17.0% of those who were HIV-positive who self-reported not taking ART reported condom use at last sexual intercourse in the last 12 months preceding the survey.
- Among females, condom use at last sexual intercourse in the 12 months preceding the survey was reported by 26.0% of those who were HIV positive who self-reported taking ART, 12.4% of those who were HIV positive but unaware of their status, and 11.1% of those who were HIV negative. Furthermore, only 10.8% of those who were HIV positive who self-reported not taking ART reported condom use at last sexual intercourse in the last 12 months preceding the survey.
- Among men ages 15-64 years, 9.2% reported having undergone medical circumcision, 16.1% reported non-medical circumcision, and 69.9% reported being uncircumcised.
- Cervical cancer screening among HIV-positive women ages 30-49 years was infrequent with 18.7% reporting ever they had been screened for cervical cancer.

- HIV testing in tuberculosis (TB) clinics was reported by 48.0% of TB clinic attendees (any respondent who had ever visited a TB clinic). Among those who were not tested for HIV during a TB clinic visit, 42.9% did not know their status and 9.1% reported not having been tested because they already knew their positive status.
- Among self-reported HIV-positive persons ages 15-64 years, 28.0% were screened for TB symptoms (cough, fever, night sweats, and weight loss) during their last HIV clinic visit.
- Among adults ages 15-64 years who had ever heard of HIV, 11% reported discriminatory attitudes towards PLHIV; 18.9% of those with no education reported discriminatory attitudes.
- 4.1% of ever-married or partnered women ages 15-64 years reported experiencing physical or sexual violence from a live-in partner in the 12 months preceding the survey.

The MPHIA indicates that HIV continues to cause a significant burden of disease in the country. Although there has been remarkable progress toward the achievement of the UNAIDS 90-90-90 targets in adults, progress in the pediatric population is not comparable. The major challenge in both populations remains diagnosis, and a critical priority is to offer PLHIV unaware of their status testing and linkage to care. An additional challenge among children is to ensure VLS among those receiving ART.

The MPHIA incidence estimates indicate that there are approximately 28,000 new HIV infections annually among adults ages 15-64 years. The considerable variation in prevalence of HIV infection and VLS across regions and population groups, and the low frequency of preventative behaviors and practices, such as condom use and VMMC, respectively, indicate that the country requires an intensified, targeted approach to the delivery of a combination of effective, evidence-based, prevention interventions in order to reduce HIV transmission. Increasing coverage of diagnosis, while sustaining high levels of treatment and VLS, are key to reduce HIV incidence.

1 INTRODUCTION

1.1 Background

Population-based HIV Impact Assessment (PHIA) is a multi-country project funded by the United States President's Emergency Plan for AIDS Relief (PEPFAR) to conduct national HIV-focused surveys that describe the status of the HIV epidemic. The surveys measure important national and regional HIV-related parameters, including progress toward the achievement of the UNAIDS 90-90-90 targets (UNAIDS, 2014), and will guide policy and funding priorities.

MPHIA was led by the government of Malawi through the MOH with technical assistance from CDC. The survey was implemented by ICAP at Columbia University in collaboration with local partners, including the CSR at the University of Malawi, the NSO, and the COM-JHP at the University of Malawi.

1.2 Overview of MPHIA 2015-2016

MPHIA, a household-based national survey, was conducted between November 2015 and August 2016 to measure the status of Malawi's national HIV response. The MPHIA offered HBTC with return of results and collected information about uptake of HIV care and treatment services. This survey is the first in Malawi to measure national HIV incidence, VLS prevalence, pediatric HIV prevalence, CD4 count distribution, presence of ARV drugs in blood, and transmitted HIV drug resistance. The survey also collected information on selected behaviors associated with HIV acquisition and transmission, and on common HIV co-morbidities and other health conditions.

Although HIV facility-based sentinel surveillance and previously conducted population-based studies provided useful knowledge regarding Malawi's HIV epidemic and HIV-control efforts, information critical to understand the current status of the epidemic and guide future interventions was still lacking. While population-level outcomes and impact can be inferred and modeled from facility-level data, this requires a series of untested assumptions about trends in the unobserved segments of the population. In addition, the population-based data that were available for HIV focused largely on knowledge, attitudes, and self-reported risk behaviors.

With its focus on measuring key biological endpoints in a nationally representative sample of the population, MPHIA provides direct estimates of HIV-infection risk and burden, the effectiveness and population-level impact of HIV-related prevention, care, and treatment interventions implemented in the country, and progress toward the achievement of the UNAIDS 90-90-90 targets.

1.3 Specific Objectives

The goal of the survey was to estimate HIV-infection incidence and prevalence in Malawi, to assess 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 and children.

Primary Objectives

- To estimate national-level annual HIV incidence among adults ages 15-64 years.
- To estimate the subnational (zonal) prevalence of VLS (defined as HIV RNA less than 1,000 copies/ml) among HIV-positive adults ages 15-64 years.

Secondary Objectives

- To estimate the national prevalence of HIV infection among children ages 0-14 years.
- To estimate the national and subnational (zonal) prevalence of HIV infection among adults ages 15-64 years.
- To determine the distribution of CD4 counts in HIV-positive persons ages 0-64 years.
- To estimate the prevalence of detectable ARVs in blood and the frequency of transmitted drug resistance among HIV-positive persons ages 0-64 years.
- To describe the prevalence of HIV-related risk behaviors among adults ages 15-64 years.
- To describe the uptake of HIV-related services among persons ages 0-64 years.
- To estimate the prevalence of stunting and undernutrition among HIV-exposed and HIV-positive children under the age of five years.

2 Survey Design, Methods, and Response Rates

The MPHIA was a nationally representative, cross-sectional, population-based survey of households across Malawi. Its target population corresponded to children ages 0-14 years and adults ages 15-64 years. The survey population excluded institutionalized children and adults.

2.1 Sample Frame and Design

The MPHIA used a two-stage, stratified cluster sample design. The sampling frame was comprised of all households in the country based on the 2008 Population and Housing Census, which includes 12,666 EAs, containing an estimated 2,869,933 households (NSO, 2008). The first stage selected 500 EAs (clusters) using a probability proportional to size method. The 500 EAs were stratified by seven geographical zones: North, Central-East, Central-West, Lilongwe City, South-East, South-West, and Blantyre City. 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 30 and the actual number of households selected per cluster ranged from 15 to 60 (Table 2.1.A).

The sample size was calculated to provide a representative national estimate of HIV incidence among adults ages 15-64 years with a relative standard error less than or equal to 28.9%, as well as representative zonal estimates of VLS prevalence among HIV-positive adults ages 15-64 years with 95% CIs with ±10% bounds around the point estimates. One-half of the households were randomly selected for inclusion of children ages 0-14 years, which was designed to provide a representative national estimate of pediatric HIV prevalence with a relative standard error less than or equal to 16.2%. The target sample size was 18,711 for adults ages 15-64 years, and 8,949 for children ages 0-14 years.

Table 2.1.A Distribution of sampled enumeration areas and households, by zone

	Enumeration areas			Households		
Zone	Urban	Rural	Total	Urban	Rural	Total
North	7	55	62	238	1364	1602
Central-East	3	75	78	62	1777	1839
Central-West	1	57	58	42	1813	1855
Lilongwe City	72	0	72	2327	0	2327
South-East	5	79	84	109	1817	1926
South-West	4	74	78	131	2400	2531
Blantyre City	68	0	68	2188	0	2188
Total	160	340	500	5097	9171	14268

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

The eligible survey population included:

- Women and men ages 18-64 years, living in the selected households, and visitors who slept in the household the night before the survey, who were willing and able to provide written consent;
- Persons ages 10-17 years living in the selected households and visitors who slept in the household the night before the survey, who were willing and able to provide written assent, and whose parents or guardians were willing and able to provide written permission for their participation; and
- Children ages 0-9 years living in the selected households and child visitors who slept in the household the night before the survey, whose parents or guardians were willing and able to provide written consent for their participation.

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

Persons ages 10-17 years were asked for assent to the interview (ages 15-17 years only) and biomarker components (ages 10-17 years) after permission was granted by their parents or guardians. Parents provided consent for biomarker testing for minors below the age of assent (ages 0-9 years). In both cases, if a parent or guardian did not want to receive his or her HIV test result, this was considered a refusal and the survey was concluded. Procedures with illiterate participants or participants with a sight disability involved the use of an impartial witness, chosen by the potential participant, who also signed or made a mark on the consent form on the tablet and the printed copy. If no witness could be identified, the potential participant or household (if the head of household was sight disabled or illiterate) was deemed ineligible.

2.3 Survey Implementation

Training of Field and Laboratory Staff

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

- Scientific objectives of the survey
- Survey design and methods
- Completion of survey forms
- Data collection
- Staff responsibilities
- Recruitment of participants
- Informed consent procedures, including human subjects protection, privacy, and confidentiality

- Blood collection for children and adults, including venipuncture and finger/heel stick
- Home-based HIV testing and counseling
- CD4 count measurement using POC PIMA Analyzer
- 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

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

Survey Staff

Fieldwork started at the end of November 2015 and was completed in August 2016. Fieldwork was conducted by 20 locally-hired field teams composed of a team leader, two field health workers, two HBTC providers, two research assistants, and a driver. Field teams included both male and female staff and members who spoke the languages used in the areas to which they were deployed. A total of 225 field coordinators, team leaders, field health workers, HBTC providers, research assistants, community-mobilization coordinators, and drivers participated in data collection. Survey personnel were selected based on their qualifications and areas of expertise. The research assistants had primary responsibility for obtaining consent and administering the interview. The field health workers conducted phlebotomy and performed CD4 counts using a POC instrument. The HBTC providers were responsible for delivering HBTC for adults and children. The field teams were supervised by four field coordinators and managed by eight field supervisors, who guided and oversaw data collection activities, performed quality checks, and provided technical support (Appendix D).

In addition, 31 laboratory technicians processed samples and performed additional procedures for HIV-1 VL, infant virologic HIV testing, and quality control (QC) and QA. National and international monitors periodically conducted direct observation of data collection activities in the field and in the laboratories to provide technical support and ensure quality.

Community Sensitization and Mobilization

Community mobilization was conducted prior to data collection to maximize community support and participation in the survey. The mobilization began before fieldwork commenced with a high-level national launch meeting that included key national and regional leaders, mass media, and other stakeholders. Community mobilization teams visited each EA prior to initiation of data collection and partnered with health surveillance assistants 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 selected households and other community residents.

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 monthly, and provided direct supervision as well as verification of results by household revisits. Daily monitoring forms for household and individual

outcome tracking were also reviewed by monitors for completeness. Field-based supervisors also supported teams by organizing supplies and transport of blood samples, coordinating community-mobilization efforts, providing technical troubleshooting, and checking the quality of household procedures and data collected.

The national and international monitoring teams observed and assessed the quality of survey procedures, including adherence to protocol and standard operating procedures, and identified and responded to challenges with data collection. Regular debriefing sessions were held between field-based supervisors and monitoring teams. Monitoring reports were circulated to collaborating institutions and the MPHIA 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 (RR), 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 Open Data Kit, 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 adult interview was administered to participants ages 15 years and older and included modules on demographic characteristics, sexual and reproductive health, marriage, male circumcision, sexual activity, HIV/ AIDS knowledge and attitudes, the HIV testing and treatment history, TB and other diseases, alcohol use, and gender norms (see Appendix F). Participants who self-reported their HIV-positive status were asked questions about their HIV care experience. Parents also answered questions about their children's (ages 0-14 years) health and participation in HBTC services as a part of the adult interview. In each household, one woman among those ages 15-64 years was also randomly selected to answer questions about her experiences with violence. Participants of any age who reported being victims of violence and minors who reported being victims of sexual exploitation were provided with referrals to social services. Female participants were interviewed by female staff, and males by male staff, whenever possible. The questionnaire was administered in the three languages most commonly used in Malawi. The English, Chichewa, and Tumbuka versions of the questionnaires were reviewed and tested thoroughly for acceptability, feasibility, and flow of questions.

2.4 Field-based Biomarker Testing

Blood Collection

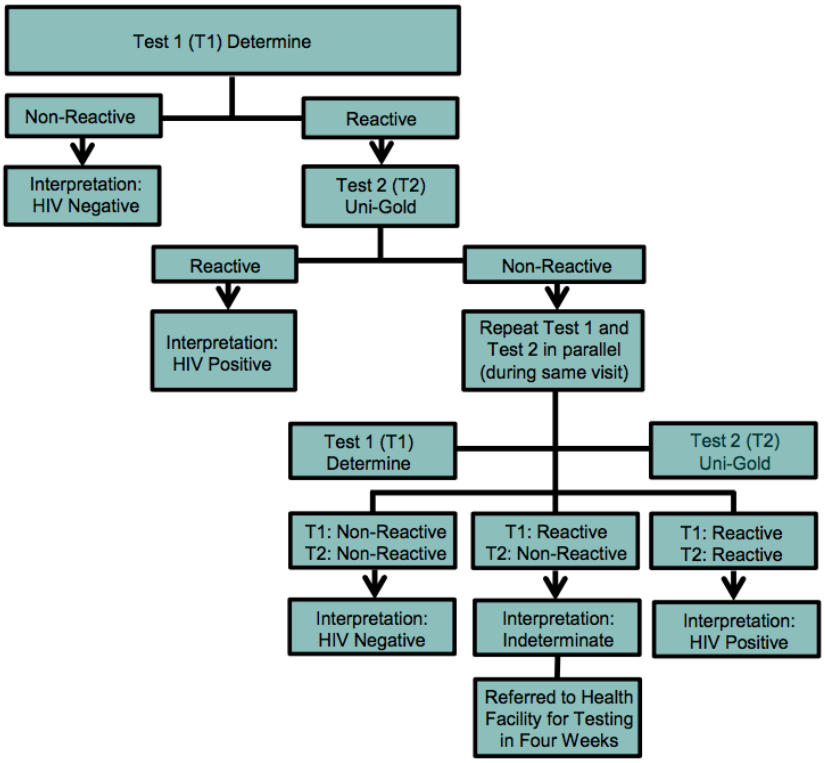
Blood was collected by qualified survey staff from consenting participants. Fourteen ml of venous blood were collected from persons ages 15 years and older, while six ml were collected from persons ages 2-14 years. One ml of capillary blood was collected from children ages 0-2 years using finger-stick for children ages 6-24 months and heel-stick for children ages 6 months and younger.

Blood samples were labeled with a unique bar-coded participant identification number (ID) 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.

HIV Home-Based Testing and Counseling

HIV HBTC was conducted in each household in accordance with national guidelines (Figure 2.4.A). 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) as a screening test, and Uni-Gold™ (Trinity Biotech, plc. Wicklow, Ireland) as a confirmatory test. Individuals with a non-reactive result on the screening test were reported as HIV negative. Individuals with a reactive screening test underwent confirmatory testing. Those with reactive results on both the screening and confirmatory tests were classified as HIV positive. Individuals with a reactive screening test result, followed by a non-reactive confirmatory test result, were retested in parallel. If the results were repeatedly discordant, the individual was classified as indeterminate.

Figure 2.4.A Household-based HIV testing algorithm, MPHIA 2015-2016



HIV-seropositive participants were referred to HIV care and treatment services at a health facility of their choice. For children under the age of 18 years, results were returned to a parent or guardian (with the presence of the child for those ages 15-17 years). Participants with indeterminate results were advised to attend a facility in four weeks for repeated testing, as per national guidelines.

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

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

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

CD4 T-Cell Count Measurement

All participants who tested HIV positive during HBTC, and a random sample of 5.0% of those who tested HIV negative, received a CD4 count measurement in the field by qualified survey staff. The measurement was performed using the Pima™ CD4 Analyzer (Abbott Molecular Inc., Chicago, Illinois, United States, formerly Alere).

Anthropometric Assessment

Height and weight measurements were obtained for all children under the age of five years who tested HIV positive during HBTC. For the purpose of comparison, 5.0% of HIV-negative children under the age of five years also underwent this assessment. Weight was measured with a flat, electronic SECA 874 Mother and Baby scale. To weigh very young children, an adult was weighed first separately and again holding the child. Height was measured with a Shorr Board® measuring board. Children younger than age 24 months were measured lying down on the board (recumbent position), while standing height was measured for the older children.

Children's height/length, weight, and age data were used to calculate two indices: height-for-age and weight-for-age. Standard deviations and z-scores were based on the WHO child growth standards (http://www.who.int/childgrowth/standards/en/). These provide reference medians and standard deviations for height and weight by age in days. After converting ages from months into days and correcting heights for the measurement position (standing or recumbent), z-scores were calculated using this reference data.

2.5 Laboratory-based Biomarker Testing

Satellite and Central Laboratories

Nine satellite laboratories for the survey were established in existing health facility laboratories. One central reference laboratory was chosen for more specialized tests. At each satellite laboratory, trained technicians performed processing of whole blood specimens into plasma aliquots and DBS cards for storage at -20°C, testing for QA, and HIV confirmatory testing. For QA of the HIV rapid testing conducted in the field, the first 50 samples tested by each field tester, and subsequently all indeterminate, and a random sample of 5.0% of specimens that tested HIV negative during HBTC, were retested in the laboratory using the national HIV rapid-testing algorithm. All specimens that tested HIV positive during HBTC, and those that had confirmed positive or indeterminate 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. Central laboratory procedures included HIV VL testing, HIV TNA PCR for infant virologic testing and for confirmation of status of those who self-reported an HIV-positive status but tested negative in HBTC, HIV recency testing, and long-term storage of samples at -80°C.

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.

Viral Load Testing

The HIV-1 VL (HIV RNA copies per ml) of confirmed HIV-positive participants was measured using the Abbott m2000 System (Abbott Molecular Inc., Chicago, Illinois, United States). The Abbott m2000 System consists of two separate instruments, the m2000sp (which carries out automated extraction, purification, and preparation of HIV-1 RNA), and the m2000rt (which amplifies, detects, and measures the HIV-1 RNA load). For plasma, the 0.6 mL protocol was used, while the open-mode protocol for the Abbott RealTime HIV-1 assay was used to measure VL from DBS samples from children and adults with insufficient volume of plasma.

Viral load results were returned within eight to 10 weeks to the health facility chosen by each HIV-positive participant. Participants were provided with a referral form during HBTC for subsequent retrieval of their results. Survey staff also contacted each participant via Short Message Service (SMS), informing them that their VL results were available at the chosen facility and further advising them to seek care and treatment.

Infant HIV Virologic Testing

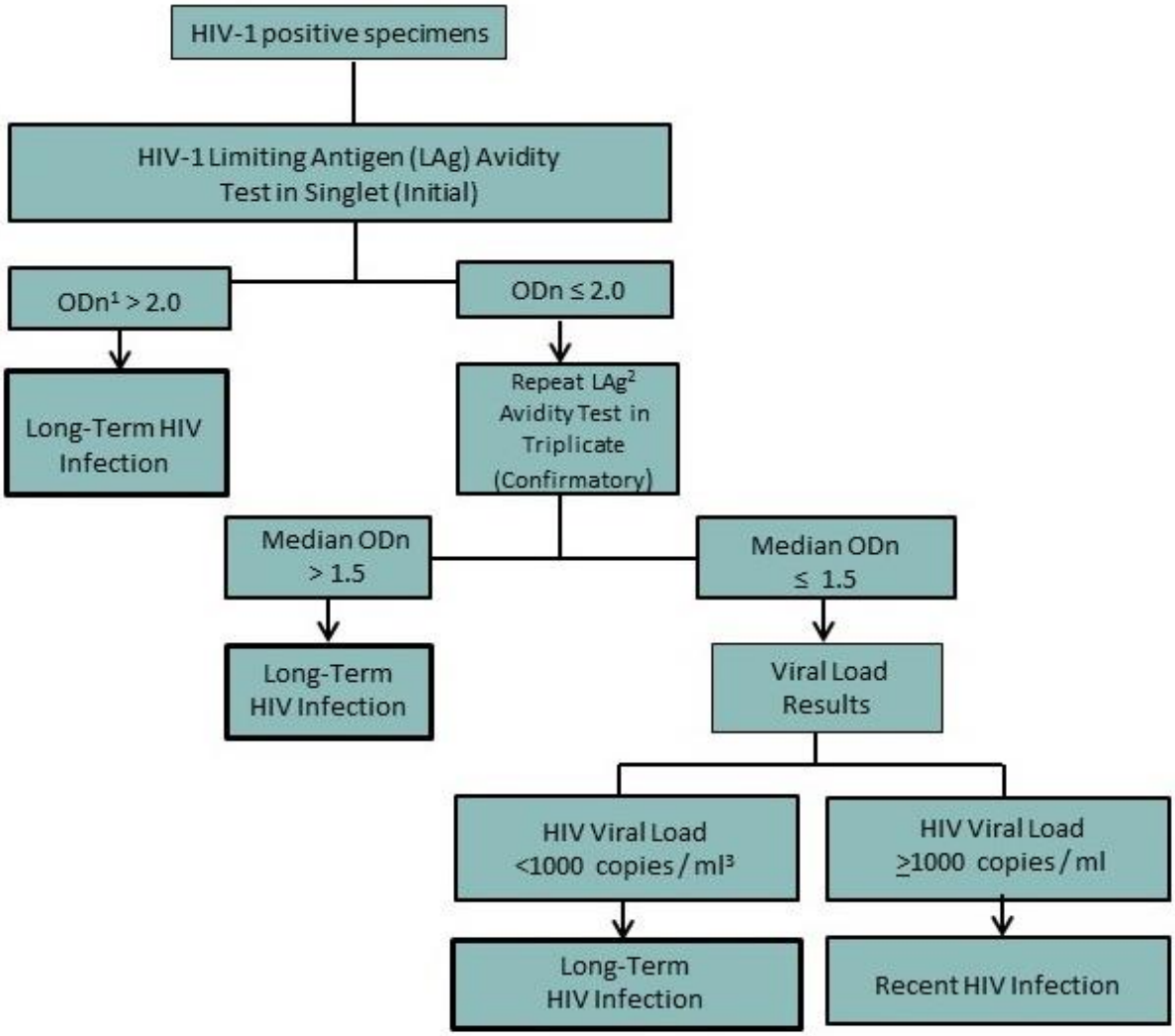
For infants ages 18 months and younger who screened positive for HIV during HBTC, virologic testing was conducted via HIV TNA PCR using the Abbott Real Time HIV-1 Qualitative Assay (Abbott Molecular, Wiesbaden, Germany) on the Abbott m2000 system. Results were returned to a health facility selected by the child's parent or guardian within eight weeks, and survey staff also contacted the parent or guardian via SMS to inform him or her that the child's results were available at the facility.

HIV Recent Infection Testing Algorithm

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

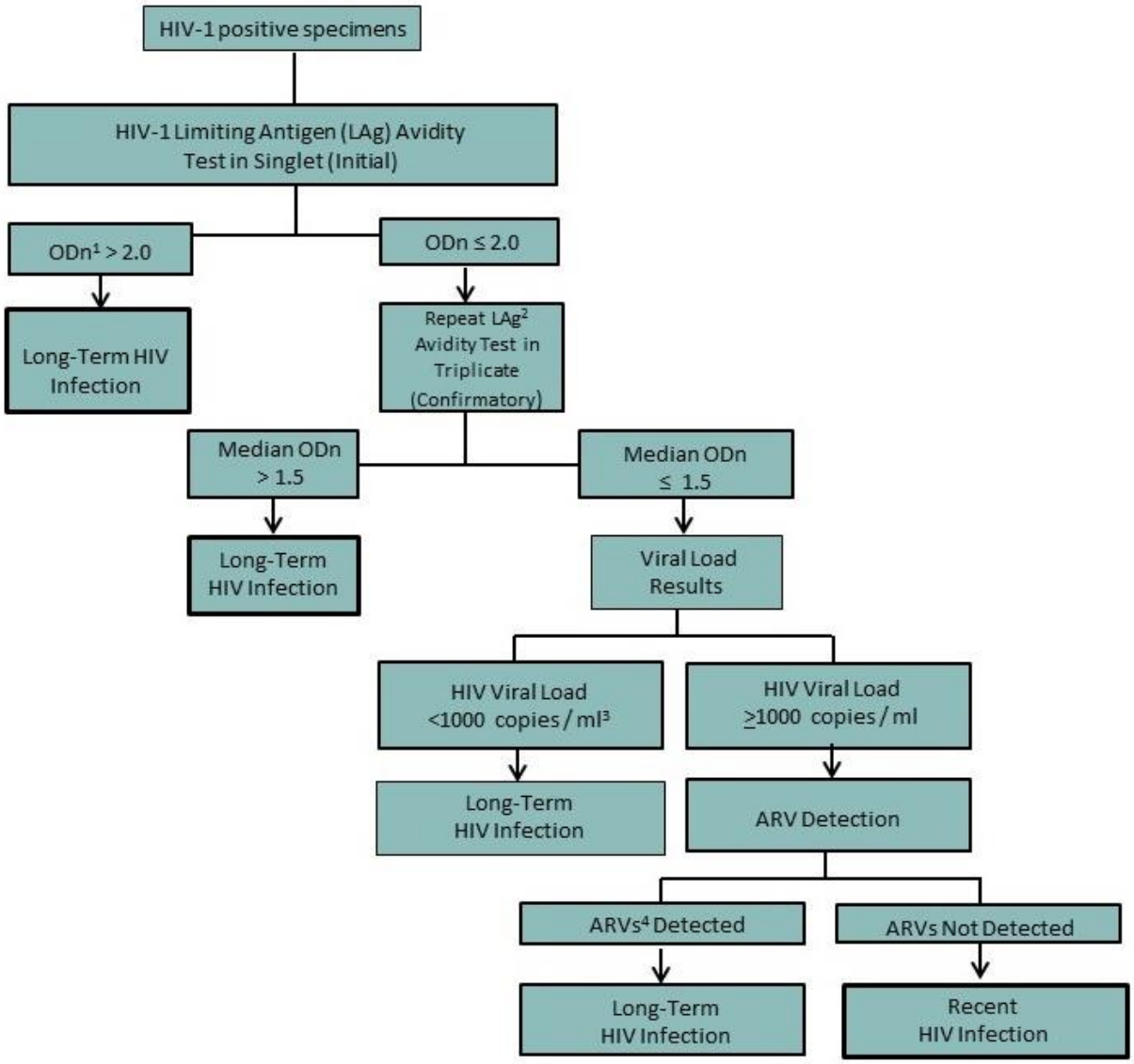
Specimens with median normalized optical density (OD_n) ≤ 1.5 were classified as potential recent infections, and their VL results were assessed. Specimens with VL < 1,000 copies/ml were classified as long-term infections, while those with VL ≥ 1,000 copies/ml were classified as recent infections (Figure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

Figure 2.5.A HIV-1 recent infection testing algorithm (LAg/VL algorithm), MPHIA 2015-2016



[1]ODn: normalized optical density; [2]LAg: Limiting Antigen; [3]ml: milliliter

Figure 2.5.B: HIV-1 recent infection testing algorithm (LAg/VL/ARV algorithm), MPHIA 2015-2016



[1]ODn: normalized optical density; [2]LAg: Limiting Antigen; [3]ml: milliliter; [4]ARV: antiretroviral

Detection of Antiretroviral Drug Resistance

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

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

Detection of Antiretrovirals

Qualitative screening, for detectable concentrations of ARVs, was conducted on DBS specimens from all HIV-positive adults and children by means of high resolution liquid chromatography coupled with tandem mass spectrometry. The method used for ARV detection was a modified version of the

methodology described by Koal et al.[3] 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, three ARVs were selected as markers for the most commonly prescribed first and second line regimens: efavirenz, atazanavir and lopinavir. Samples from participants who were virally suppressed and/or self-reported on ART, but had no evidence of the first three compounds, were tested for nevirapine. These ARVs were also selected based on their relatively long half-lives, allowing for a longer period of detection following intake.

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

Detection of ARV was performed at the laboratory in the Department of Clinical Pharmacology of the Department of Medicine at the University of Cape Town in South Africa.

2.6 Data Processing and Analysis

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

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

Descriptive analyses of RR, characteristics of respondents, HIV prevalence, CD4 count distribution, HIV testing, self-reported HIV status, self-reported ART, VLS, PMTCT indicators, and sexual behavior were conducted using SAS 9.4.

Incidence estimates were based on the number of HIV infections identified as recent with the HIV-1 LAg Avidity plus VL algorithm, and obtained by 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 (MDRI)=130 days (95% CI: 118, 142), a time cutoff (T) = 1.0 year and percentage false recent (PFR) = 0.00.

2.7 Response Rates

Household RR were calculated using the American Association for Public Opinion Research Response Rate 4 method (AAPOR, 2015) 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, not residential units, and household units with no eligible respondents were considered not eligible and excluded from the calculation.

Individual interview RR were calculated as the number of individuals who were interviewed divided by the number of individuals eligible to participate in the survey. Blood draw RR for those ages 15-64 years were calculated as the number of individuals who provided blood divided by the number of individuals who were interviewed. Blood draw RR for those ages 0-14 years were calculated as the number of individuals who provided blood divided by the number of individuals eligible to participate in the survey.

Of the 14,268 selected households, 12,731 and 11,386 were occupied and interviewed, respectively. The overall household RR (unweighted) was 88.6% (83.5% in urban areas and 91.7% in rural areas). After adjusting for differential sampling probabilities and nonresponse, the overall weighted household RR was 90.2% (Table 2.7.A).

A total of 22,405 adults (10,170 males and 12,235 females) ages 15-64 years were eligible to participate in the survey. A total of 19,652 adults participated in the individual interview: interview RR were 81.5% for males and 92.9% for females ages 15-64 years. Among those adults who were interviewed, 87.0% of males and 87.8% of females also had their blood drawn (Table 2.7.B).

In MPHIA, children ages 0-14 years in half of the selected households were eligible for blood draw. Of the 6,762 eligible children ages 0-9 years, 59.4% of males and 60.9% of females had their blood drawn. Of the 3,231 eligible children ages 10-14 years, 65.1% of males and 64.7% of females had their blood drawn (Table 2.7.B).

Table 2.7.A Household response rates

Number of households selected, occupied, and interviewed and household RR (unweighted and weighted), by residence, MPHIA 2015-2016

Result	Residence		Total
	Urban	Rural	
Household interviews			
Households selected	5,097	9,171	14,268
Households occupied	4,689	8,042	12,731
Households interviewed	3,958	7,428	11,386
Household response rate[1] (unweighted)	83.5	91.7	88.6
Household response rate[1] (weighted)	85.1	91.2	90.2

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

Table 2.7.B 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 2015-2016

Result	Residence				Total	
	Urban		Rural			
	Males	Females	Males	Females	Males	Females
Eligible individuals, age 0-9 years						
Number of eligible individuals	1,003	1,073	2,282	2,404	3,285	3,477
Blood draw response rate (unweighted)	60.4	62.3	58.9	60.3	59.4	60.9
Blood draw response rate (weighted)	59.5	60.7	56.2	57.5	56.7	58.0
Eligible individuals, age 10-14 years						
Number of eligible individuals	478	531	1,142	1,080	1,620	1,611
Blood draw response rate (unweighted)	65.7	63.1	64.8	65.6	65.1	64.7
Blood draw response rate (weighted)	65.6	64.7	62.4	62.4	62.8	62.8
Eligible individuals, age 15-24 years						
Number of eligible individuals	1,545	1,845	2,253	2,749	3,798	4,594
Interview response rate (unweighted)	79.9	88.0	81.4	90.1	80.8	89.3
Interview response rate (weighted)	81.5	87.7	80.6	89.5	80.8	89.2
Blood draw response rate (unweighted)	87.3	88.2	87.2	86.6	87.3	87.3
Blood draw response rate (weighted)	88.0	89.3	86.5	85.4	86.8	86.2
Eligible individuals, age 15-49 years						
Number of eligible individuals	3,808	4,312	5,222	6,694	9,030	11,006
Interview response rate (unweighted)	75.9	91.0	84.1	93.8	80.7	92.7
Interview response rate (weighted)	75.9	91.1	83.5	93.4	81.9	93.0
Blood draw response rate (unweighted)	84.4	88.4	88.0	87.3	86.6	87.7
Blood draw response rate (weighted)	85.2	89.1	87.4	86.1	86.9	86.7
Eligible individuals, age 15-64 years						
Number of eligible individuals	4,150	4,661	6,020	7,574	10,170	12,235
Interview response rate (unweighted)	76.4	91.1	85.0	94.1	81.5	92.9
Interview response rate (weighted)	76.4	91.2	84.4	93.7	82.7	93.2
Blood draw response rate (unweighted)	84.7	88.4	88.5	87.4	87.0	87.8
Blood draw response rate (weighted)	85.5	89.0	87.8	86.3	87.3	86.8

[1]Interview response rate = number of individuals interviewed/number of eligible individuals
[2]Blood draw response rate = number of individuals who provided blood/number of individuals interviewed

2.8 References

1. Malawi National Statistical Office (2008). *Malawi 2008 Population and Housing Census Results*. Retrieved from http://www.nsomalawi.mw/images/stories/data_on_line/demography/census_2008/Main%20Report/Census%20Main%20Report.pdf.

2. Ministry of Health, Malawi (2016). *3rd Edition of the Malawi Guidelines for Clinical Management of HIV in Children and Adults, 2016*. Retrieved from https://aidsfree.usaid.gov/sites/default/files/malawi_art_2016.pdf.

3. Koal, T., et al. (2005). Quantification of antiretroviral drugs in DBS samples by means of liquid chromatography/tandem mass spectrometry. *Rapid Communications in Mass Spectrometry*, 19(21), 2995-3001.

4. The American Association for Public Opinion Research (2015). *Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys. 8th edition*. Retrieved from AAPOR: https://www.aapor.org/AAPOR_Main/media/publications/Standard-Definitions2015_8theditionwithchanges_April2015_logo.pdf).

3 SURVEY HOUSEHOLD CHARACTERISTICS

3.1 Key Findings

- In Malawi, 18% of the households had at least one HIV-positive member (25.4% of urban and 16.3% of rural households).
- In Malawi, 16.4% of the households are headed by a person living with HIV (21.3% of the female-headed and 12.2% of the male-headed households).

3.2 Background

This chapter describes the characteristics of households surveyed in MPHIA. Household composition is described in terms of sex of the head of household, as well as the size of the household. The age structure of the de facto household population is described by sex as well as urban/rural residence. This chapter also describes the prevalence and composition of households impacted by HIV, which are households with one or more HIV-positive members.

3.3 Household Composition

Overall, while the majority of the households (55.9%) were male-headed, a large percentage of the households (44.1%) were headed by females. This distribution was similar between urban and rural areas: 57.8% of urban households were male-headed and 42.2% were female-headed, while 55.5% of rural households were male-headed and 44.5% were female-headed. The median household size was four members (interquartile range three to five) and the median number of children ages 18 years of age and younger in households was two (interquartile range 1-3) (Table 3.3.A).

Children under the age of 15 years comprised 46.3% (23.1% males and 23.3% females) of the de facto household population, while those ages 15-49 years constituted 42.7% (18.8% males and 23.9% females) and those ages 50 years and older constituted 11.0% (4.6% males and 6.1% females; Figure 3.3.A; Table 3.3.B).

Overall, the de facto population in rural areas was younger than that in urban areas: 47.4% of the rural population was younger than 15 years compared with 41.2% of the urban population. In urban areas, the distribution by age did not differ considerably between males and females, with around half of the population ages 15-49 years (50.8% of males and 53.3% of females), and a quarter ages 5-14 years (27.9% of males and 26.9% of females). In contrast, in rural areas larger percentages of males than of females were younger than the age of 15 years (16.5% of males were ages 0-4 years and 34.5% were ages 5-14 years, while 14.9% of females were ages 0-4 years and 29.4% were ages 5-14 years). In urban and rural areas, the proportion of males and females over the age of 50 years was similar (urban: 7.0% and 6.5%; rural: 10.6% and 12.8%) (Table 3.3.C; Figure 3.3.B).

Table 3.3.A Household composition

Percent distribution of households by sex of head of household; median size of household and median (Q1[1], Q3[2]) number of children 18 years of age, by residence, MPHIA 2015-2016

Characteristic	Residence				Total	
	Urban		Rural			
	Percent	Number	Percent	Number	Percent	Number
Household headship						
Male	57.8	2,287	55.5	4,136	55.9	6,423
Female	42.2	1,671	44.5	3,292	44.1	4,963
Total	100.0	3,958	100.0	7,428	100.0	11,386

Characteristic	Residence				Total	
	Urban		Rural			
	Median	Q1, Q3	Median	Q1, Q3	Median	Q1, Q3
Size of households	4	(3, 5)	4	(3, 6)	4	(3, 5)
Number of children under 18 years of age	2	(1, 3)	2	(1, 3)	2	(1, 3)

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

Table 3.3.B Distribution of de facto household population by age and sex

Percent distribution of the de facto household population, by five-year age groups and sex, MPHIA 2015-2016

Age	Males		Females		Total	
	Percent	Number	Percent	Number	Percent	Number
0-4	7.5	3,267	7.8	3,358	15.3	6,625
5-9	8.1	3,444	8.1	3,506	16.2	6,950
10-14	7.5	3,202	7.4	3,237	14.9	6,439
15-19	4.7	2,172	4.8	2,213	9.5	4,385
20-24	3.3	1,679	5.1	2,413	8.4	4,092
25-29	2.8	1,438	3.9	1,858	6.8	3,296
30-34	2.6	1,293	3.6	1,688	6.2	2,981
35-39	2.3	1,111	2.9	1,307	5.1	2,418
40-44	1.8	847	2.1	909	3.9	1,756
45-49	1.3	589	1.5	660	2.8	1,249
50-54	1.0	459	1.3	562	2.4	1,021
55-59	0.9	387	0.9	389	1.8	776
60-64	0.7	301	0.6	282	1.3	583
65-69	0.7	308	1.3	517	2.1	825
70-74	0.6	233	0.8	317	1.4	550
75-79	0.3	122	0.5	200	0.9	322
≥80	0.4	152	0.7	238	1.1	390
Total	46.6	21,004	53.4	23,654	100.0	44,658

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

Percent distribution of the de facto household population, by sex, age, and residence, MPHIA 2015-2016

	Urban					
	Males		Females		Total	
Age	Percent	Number	Percent	Number	Percent	Number
0-4	14.3	1,068	13.3	1,072	13.8	2,140
5-14	27.9	1,974	26.9	2,110	27.4	4,084
15-49	50.8	3,864	53.3	4,333	52.1	8,197
≥50	7.0	527	6.5	516	6.7	1,043
Total	100.0	7,433	100.0	8,031	100.0	15,464

	Rural					
	Males		Females		Total	
Age	Percent	Number	Percent	Number	Percent	Number
0-4	16.5	2,199	14.9	2,286	15.6	4,485
5-14	34.5	4,672	29.4	4,633	31.8	9,305
15-49	38.4	5,265	42.9	6,715	40.8	11,980
≥50	10.6	1,435	12.8	1,989	11.8	3,424
Total	100.0	13,571	100.0	15,623	100.0	29,194

Figure 3.3.A Distribution of the de facto population by sex and age, MPHIA 2015-2016

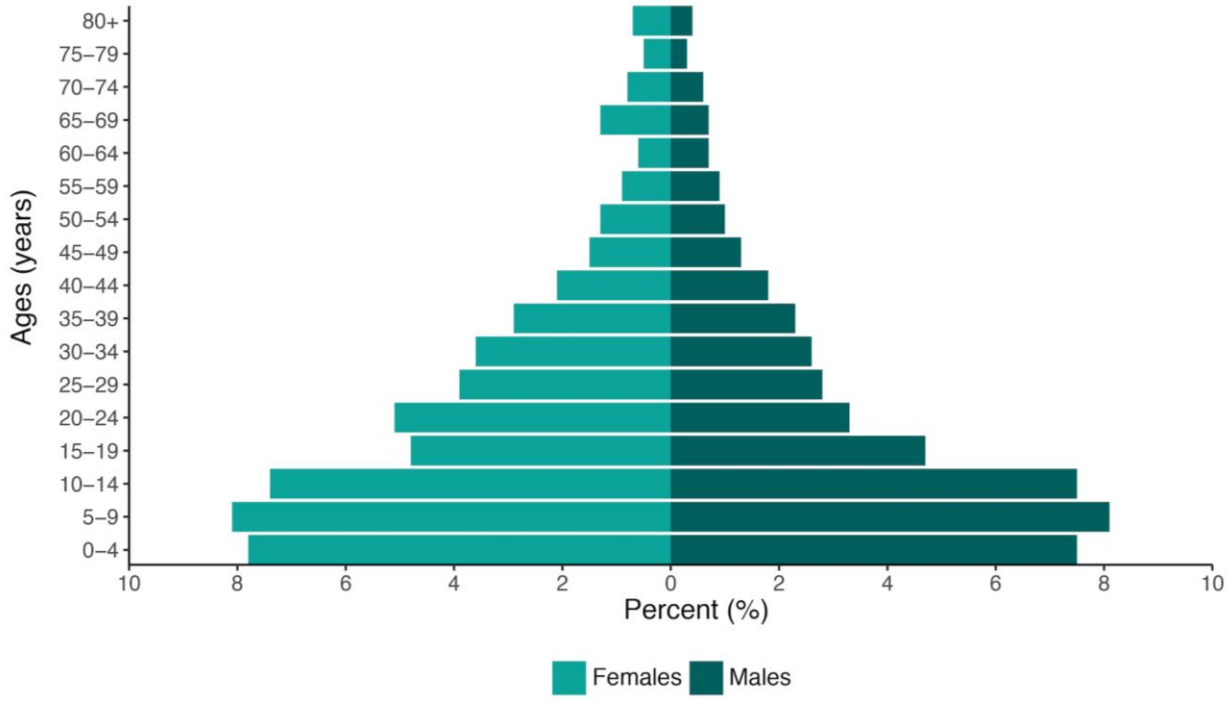
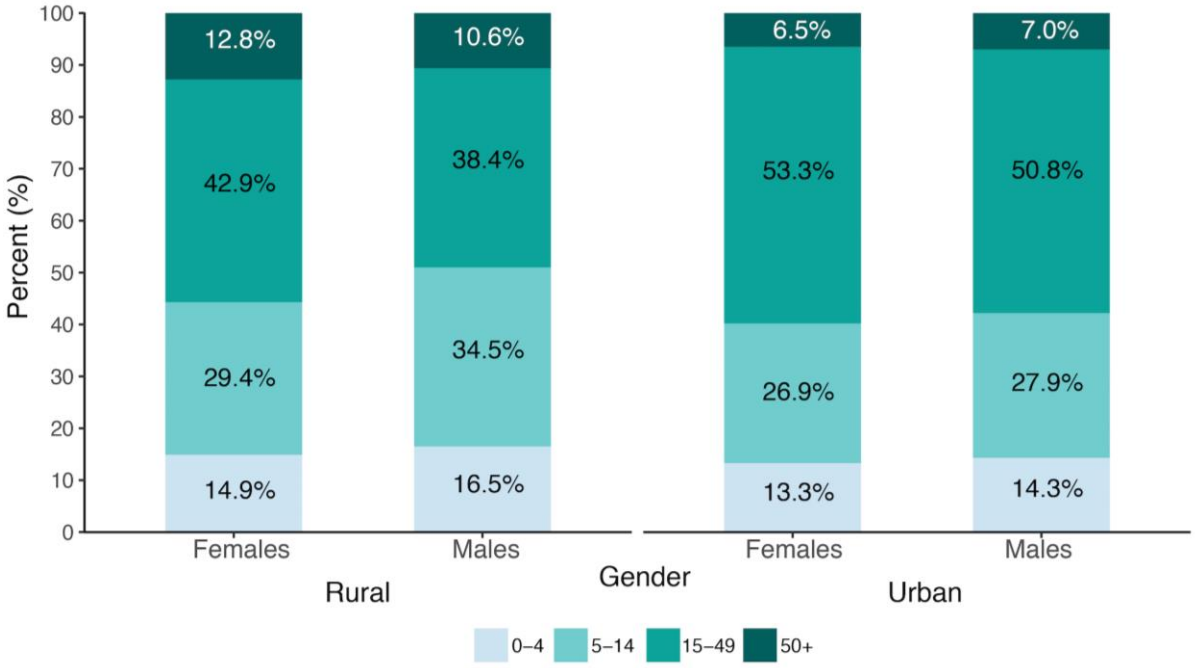


Figure 3.3.B Household population by age, sex, and residence, MPHIA 2015-2016



3.4 Prevalence of HIV-Affected Households

In Malawi, 18.0% of the households had at least one HIV-positive member (25.4% of urban households and 16.3% of rural households) (Table 3.4.A). Among these HIV-affected households, 77.7% had one HIV-positive member, 20.5% had two HIV-positive members. The distribution was similar for urban and rural households (Table 3.4.B). Overall, 16.4% of households in the country had an HIV-positive head of household. Approximately twice the percentage of female-headed households have a head of the household who is living with HIV as compared to male-headed households (21.3% of female household heads were HIV-positive in contrast to 12.2% of male household heads). (Table 3.4.C).

Table 3.4.A Prevalence of HIV-affected households

Percentage of households with at least one household member who tested HIV positive, by residence, MPHIA 2015-2016

Residence	Percent	Number
Urban	25.4	3,429
Rural	16.3	5,930
Total	18.0	9,359

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

Among households with at least one HIV-positive household member, percent distribution of households by number of HIV-positive household members, by residence, MPHIA 2015-2016

Number of HIV-positive household members	Residence					
	Urban		Rural		Total	
	Percent	Number	Percent	Number	Percent	Number
1	79.1	684	77.1	754	77.7	1,438
2	19.4	180	20.9	207	20.5	387
3	*	14	*	20	(1.8)	34
4	*	3	*	0	*	3
5	*	0	*	0	*	0
≥6	*	0	*	0	*	0
Total	100.0	881	100.0	981	100.0	1,862

Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.
An asterisk indicates that an estimate is based on a very small number (less than 25) of unweighted cases and has been suppressed.

Table 3.4.C Prevalence of households with an HIV-positive head of household

Percentage of households with an HIV-positive head of household, by sex of head of household, MPHIA 2015-2016

Sex of head of household	Percent	Number
Male	12.2	3,950
Female	21.3	3,534
Total	16.4	7,484

Figure 3.4.A Prevalence of HIV-affected households by residence, MPHIA 2015-2016

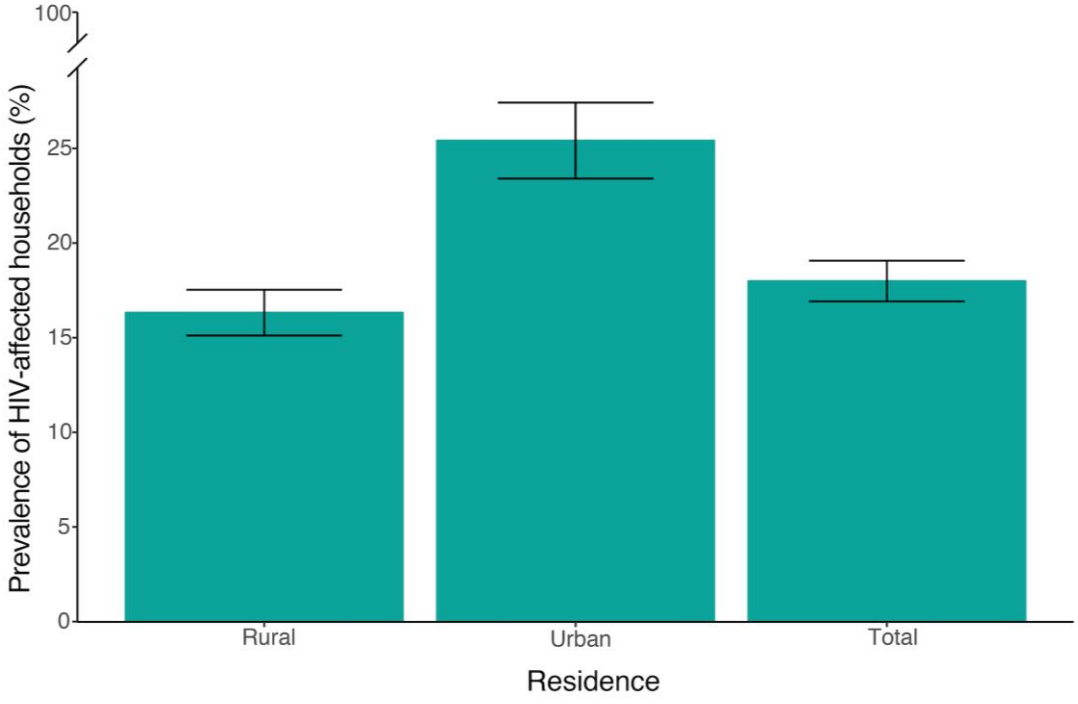


Figure 3.4.B HIV-affected households by number of HIV-positive members and residence, MPHIA 2015-2016

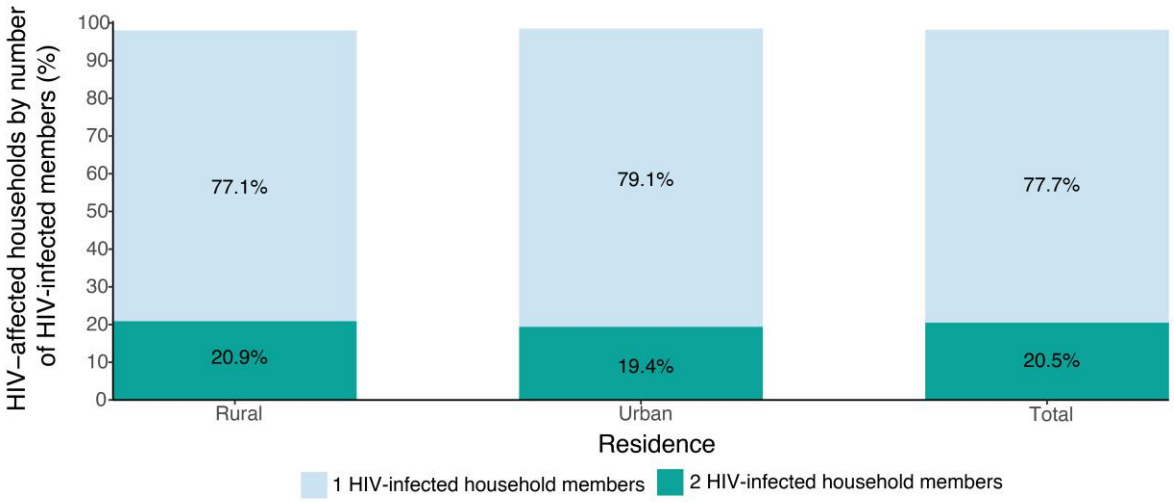
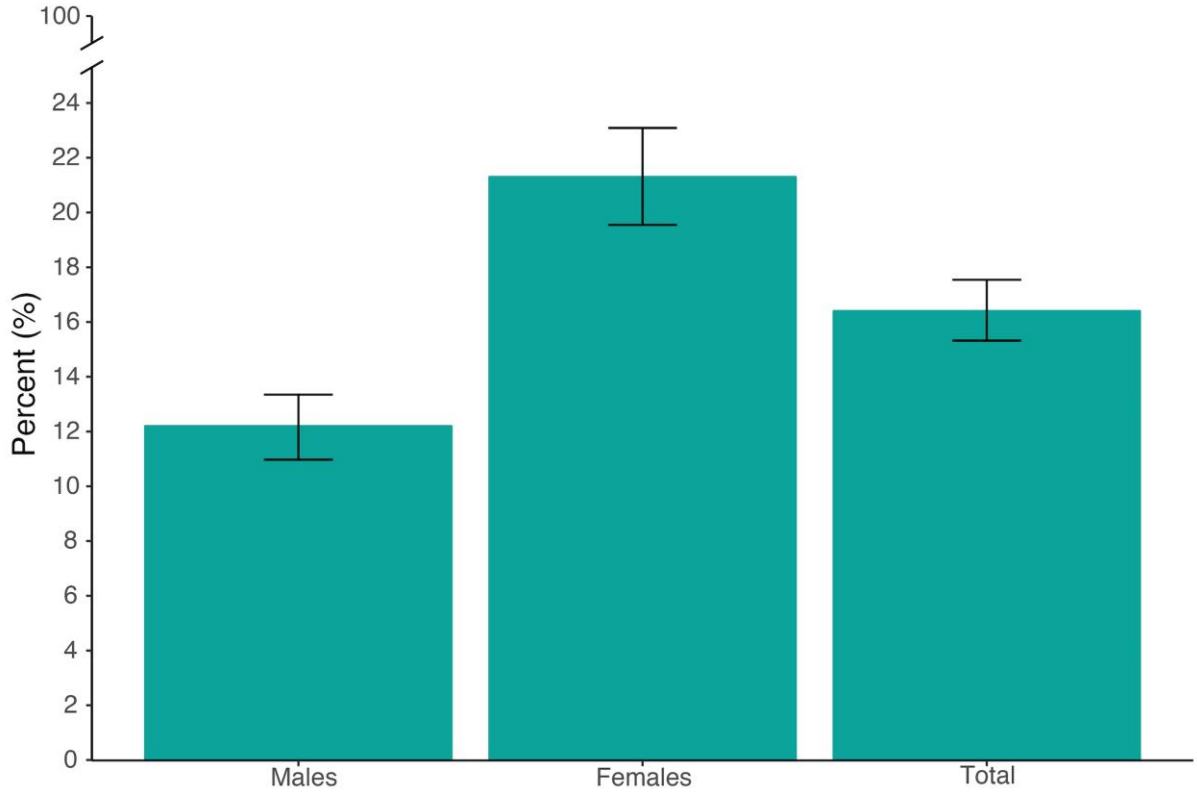


Figure 3.4.C Prevalence of households with an HIV-positive head of household by sex, MPHIA 2015-2016



4 SURVEY RESPONDENT CHARACTERISTICS

4.1 Key Findings

- In Malawi, 21.2% of adults were ages 15-19 years (68.2% were ages 20-49 years and 10.7% were ages 50-64 years).
- In Malawi, 72.5% of children who participated were younger than the age of 10 years and 27.5% were ages 10-14 years.
- In Malawi, 80.1% of adults and 85.3% of children were residing in rural areas.

4.2 Background

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

4.3 Demographic Characteristics of the Adult Population

Overall, four in five (80.1%) people ages 15-64 years lived in rural areas. The majority were (60.9%) married or living with a partner, while over a third (35.8%) of the males and one in five (21.6%) females had never been married. Almost two-thirds (62.1%) of the people ages 15-64 years had completed only primary education, while one-fourth (25.2%) had completed secondary education. Only 3.3% had more than secondary education. The most common ethnic groups were the Chewa (36.3%), the Lomwe (18%), the Yao (12.3%), the Ngoni (11%), and the Tumbuka (10.5%). Close to 80% of people professed Christian religions, while 11.7% followed Islam. Overall, 21.2% of the population was ages 15-19 years and 68.2% was ages 20-49 years, while only 10.7% was ages 50-64 years (Table 4.3.A).

Table 4.3.A Demographic characteristics of the adult population

Percent distribution of the population age 15-64 years, by sex and other selected demographic characteristics, MPHIA 2015-2016

	Males		Females		Total	
Characteristic	Percent	Number	Percent	Number	Percent	Number
Residence						
Urban	20.9	3,169	18.9	4,244	19.9	7,413
Rural	79.1	5,115	81.1	7,124	80.1	12,239
Zone						
North	14.3	1,109	13.2	1,424	13.8	2,533
Central-East	17.4	1,272	15.1	1,493	16.2	2,765
Central-West	20.9	951	20.5	1,303	20.7	2,254
Lilongwe City	7.7	1,464	6.5	1,924	7.1	3,388
South-East	16.5	910	19.8	1,474	18.2	2,384
South-West	16.5	1,217	19.0	1,925	17.8	3,142
Blantyre City	6.6	1,361	5.9	1,825	6.2	3,186
Marital status						
Never married	35.8	3,007	21.6	2,249	28.5	5,256
Married or living together	59.9	4,860	61.9	7,248	60.9	12,108
Divorced or separated	3.8	347	11.7	1,285	7.9	1,632
Widowed	0.5	58	4.9	574	2.8	632
Education						
No education	5.4	413	13.2	1,247	9.4	1,660
Primary	59.8	4,468	64.3	6,757	62.1	11,225
Secondary	30.5	2,857	20.2	2,896	25.2	5,753
More than secondary	4.4	543	2.3	461	3.3	1,004
Wealth quintile						
Lowest	13.9	877	16.8	1,426	15.4	2,303
Second	18.2	1,192	18.1	1,625	18.2	2,817
Middle	19.7	1,310	19.9	1,831	19.8	3,141
Fourth	22.4	1,750	21.3	2,270	21.8	4,020
Highest	25.8	3,155	23.8	4,216	24.8	7,371
Religion						
Catholic	19.5	1,646	18.8	2,142	19.2	3,788
CCAP[1]	18.3	1,637	16.9	2,128	17.6	3,765
Anglican	2.5	209	2.3	276	2.4	485
Seventh Day Adventist	5.9	561	6.1	833	6.0	1,394
Baptist	2.4	207	2.3	268	2.4	475
Other Christian	29.9	2,370	33.5	3,739	31.8	6,109
Muslim	10.6	751	12.6	1,103	11.7	1,854
Other	7.5	640	6.6	807	7.0	1,447
None	3.4	245	0.7	63	2.0	308
Ethnicity						
Chewa	37.8	2,806	34.8	3,616	36.3	6,422
Lomwe	17.5	1,608	18.6	2,354	18.0	3,962
Ngoni	10.8	1,011	11.2	1,421	11.0	2,432
Nkhonde	0.9	85	0.9	117	0.9	202
Sena	3.9	335	3.9	472	3.9	807
Tonga	1.8	154	1.9	235	1.8	389
Tumbuka	10.8	941	10.2	1,216	10.5	2,157
Yao	11.3	881	13.3	1,287	12.3	2,168
Other	5.1	452	5.3	627	5.2	1,079
Age						
15-19	21.5	1,680	21.0	1,858	21.2	3,538
20-24	17.7	1,389	17.4	2,244	17.5	3,633
25-29	14.7	1,120	14.7	1,756	14.7	2,876
30-34	12.1	1,010	12.3	1,608	12.2	2,618
35-39	9.8	877	9.9	1,238	9.9	2,115
40-44	7.8	706	7.9	873	7.9	1,579
45-49	6.0	501	6.1	626	6.0	1,127
50-54	4.4	395	4.5	531	4.5	926
55-59	3.4	332	3.5	365	3.5	697
60-64	2.5	274	2.8	269	2.7	543
Total 15-24	39.2	3,069	38.4	4,102	38.8	7,171
Total 15-49	89.6	7,283	89.2	10,203	89.4	17,486
Total 15-64	100.0	8,284	100.0	11,368	100.0	19,652

[1]Church of Central Africa Presbyterian.

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

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

4.4 Demographic Characteristics of the Pediatric Population

Survey participants younger than the age of 10 years accounted for 72.5% of all participants ages 0-14 years. The majority of the respondents ages 0-14 years resided in rural areas (85.3%), and the distribution across the five wealth quintiles ranged from 18.6% in the highest wealth quintile to 21.1% percent in the fourth wealth quintile (Table 4.4.A)

Table 4.4.A Demographic characteristics of the pediatric population

Percent distribution of the population ages 0-14 years, by sex and selected demographic characteristics, MPHIA 2015-2016

	Males		Females		Total	
Characteristic	Percent	Number	Percent	Number	Percent	Number
Age						
0-17 months	11.1	418	11.4	467	11.2	885
18-59 months	29.0	1,103	27.9	1,128	28.5	2,231
5-9 years	32.8	1,569	32.8	1,671	32.8	3,240
10-14 years	27.1	1,481	28.0	1,462	27.5	2,943
Residence						
Urban	14.3	1,370	15.2	1,485	14.7	2,855
Rural	85.7	3,201	84.8	3,244	85.3	6,445
Zone						
North	14.0	683	14.3	711	14.1	1,394
Central-East	16.8	680	15.8	660	16.3	1,340
Central-West	21.1	554	21.1	576	21.1	1,130
Lilongwe City	5.1	626	5.3	686	5.2	1,312
South-East	20.2	645	20.9	675	20.5	1,320
South-West	18.5	809	17.9	804	18.2	1,613
Blantyre City	4.4	574	4.5	617	4.5	1,191
Wealth quintile						
Lowest	20.7	724	19.8	721	20.3	1,445
Second	19.0	720	19.0	734	19.0	1,454
Middle	21.6	840	20.4	803	21.0	1,643
Fourth	21.0	989	21.2	989	21.1	1,978
Highest	17.7	1,298	19.6	1,482	18.6	2,780
Total 0-4	40.2	1,521	39.3	1,596	39.7	3,117
Total 0-14	100.0	4,571	100.0	4,729	100.0	9,300

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

5 HIV INCIDENCE

5.1 Key Findings

- Annual incidence of HIV infection among adults ages 15-64 years in Malawi was 0.37%: 0.50% among females, and 0.23% among males. This corresponds to approximately 28,000 new cases of HIV infection annually among adults ages 15-64 years in the country.

5.2 Background

HIV prevalence is a measure of the relative burden of disease in a population, but is not optimal for measuring acute changes in an HIV epidemic, including changes in HIV transmission. HIV incidence is a measure of new HIV infections in a population over time. It can provide important information on the status of the HIV epidemic and can be used for effective, targeted HIV prevention planning in groups that are most vulnerable to recent infection and to measure impact of HIV prevention programs. This chapter presents annual estimates of HIV incidence among participants ages 15-64 years 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 was not powered to estimate incidence at the zonal level or across different subgroups.

Two laboratory-based incidence testing algorithms (HIV-1 LAg avidity plus VL and HIV-1 LAg avidity plus VL and ARV detection) were used to distinguish recent from long-term infection, and incidence estimates were obtained according to 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 (MDRI)=130 days (95% CI: 118, 142), with time cutoff (T)=1.0 year and residual proportion false recent (PFR)=0.00. Survey weights are utilized for all estimates. All HIV-positive participants ages 18 months and older were tested for recent infection using HIV-1 LAg avidity assay.

Incidence estimation is based on recent/long-term (LT) classification using algorithms with LAg avidity.[1,2] The original algorithm incorporated VL results to mitigate misclassification from persons who may be elite controllers or on ART – both groups characterized by low VL. As ART coverage has increased, it has become apparent that some individuals on treatment for long-periods of time have the potential to be misclassified by the LAg plus VL algorithm as a recent infection. Although they may have suppressed VL for years, drug resistance or lack of adherence may result in VL $\geq$ 1000 copies/ml. Based in part on data from multiple PHIA surveys, the updated incidence algorithm includes ARV detection as a second exclusion criteria. The addition of ARV detection is expected to produce more accurate estimates of both HIV incidence and transmitted HIV drug resistance.

5.3 HIV Incidence Among Adults

HIV incidence estimates using LAg Avidity and HIV viral load

Using the LAg Avidity assay and VL algorithm, estimated incidence was 0.39% (95% CI: 0.22%-0.57%) among adults ages 15-64 years (0.26% among males and 0.52% among females). Annual incidence

peaked among males ages 35-49 years (0.49%), and females ages 25-34 years (0.87%). HIV incidence for adults ages 15-49 years was estimated at 0.36% (95% CI: 0.19%-0.53%). HIV incidence was 0.26% among males and 0.46% among females ages 15-49 years. Estimates are not statistically significantly different; MPHIA was not designed to compare incidence estimates across demographic subgroups (Table 5.3.A).

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

Using the LAg Avidity assay, VL and ARV algorithm, estimated incidence was 0.37% (95% CI: 0.20%-0.54%) among adults ages 15-64 years (0.23% among males and 0.50% among females). Annual incidence peaked among males ages 25-34 years (0.40%) and among females ages 25-34 years (0.83%). HIV incidence for adults ages 15-49 years was estimated at 0.33% (95% CI: 0.17%-0.49%; 0.22% among males and 0.44% among females). Estimates are not statistically significantly different; MPHIA was not designed to compare incidence estimates across demographic subgroups (Table 5.3.B).

Table 5.3.A Annual HIV incidence using LAg/VL[1] testing algorithm

Annual incidence of HIV among persons ages 15-49 and 15-64 years using LAg/VL[1] algorithm, by sex and age, MPHIA 2015-2016

	Males		Females		Total	
Age	Percentage annual incidence[2]	95% CI[3]	Percentage annual incidence[2]	95% CI	Percentage annual incidence[2]	95% CI
15-24	0.05	(0.00, 0.19)	0.40	(0.04, 0.76)	0.23	(0.03, 0.43)
25-34	0.40	(0.00, 0.90)	0.87	(0.11, 1.63)	0.63	(0.20, 1.07)
35-49	0.49	(0.00, 1.09)	0.06	(0.00, 0.25)	0.28	(0.00, 0.57)
15-49	0.26	(0.04, 0.47)	0.46	(0.18, 0.75)	0.36	(0.19, 0.53)
15-64	0.26	(0.06, 0.47)	0.52	(0.22, 0.82)	0.39	(0.22, 0.57)

[1] LAg/VL: Limiting antigen/viral load
[2] Relates to Global AIDS Monitoring indicator 1.3: Retention on antiretroviral therapy at 12 months
[3] CI (confidence interval) indicates the interval that is expected to include the true population parameter 95% of the time

Table 5.3.B Annual HIV incidence using LAg/VL/ARV[1] testing algorithm

Annual incidence of HIV among persons ages 15-49 and 15-64 years, by sex and age, using LAg/VL/ARV[1] algorithm, MPHIA 2015-2016

	Males		Females		Total	
Age	Percentage annual incidence[2]	95% CI[3]	Percentage annual incidence[2]	95% CI	Percentage annual incidence[2]	95% CI
15-24	0.05	(0.00, 0.19)	0.38	(0.02, 0.74)	0.22	(0.02, 0.41)
25-34	0.40	(0.00, 0.90)	0.83	(0.09, 1.57)	0.61	(0.18, 1.04)
35-49	0.34	(0.00, 0.82)	0.06	(0.00, 0.25)	0.20	(0.00, 0.45)
15-49	0.22	(0.02, 0.42)	0.44	(0.16, 0.72)	0.33	(0.17, 0.49)
15-64	0.23	(0.04, 0.43)	0.50	(0.20, 0.79)	0.37	(0.20, 0.54)

[1] LAg/VL/ARV: Limiting antigen/viral load/antiretrovirals
[2] Relates to Global AIDS Monitoring indicator 1.3: Retention on antiretroviral therapy at 12 months
[3] CI (confidence interval) indicates the interval that is expected to include the true population parameter 95% of the time

5.4 Gaps and Unmet Needs

- The data suggests that there is still a deficit in the effective implementation of strategies to stop transmission and prevent the occurrence of new HIV infections, especially among women.

5.5 References

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

2. Kassanjee, R., et al. (2012). A New General Biomarker-based Incidence Estimator. *Epidemiology*, 23(5):721-8. doi: 10.1097/EDE.0b013e3182576c07.

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

6 HIV PREVALENCE

6.1 Key Findings

- Prevalence of HIV infection among adults ages 15-64 years in Malawi was 10.6%: 12.5% among females and 8.5% among males. This corresponds to approximately 900,000 PLHIV ages 15-64 years in the country.
- HIV prevalence among females was significantly higher than among male peers among those ages 20-24 years, ages 25-29 years, ages 30-34 years, and ages 35-39 years.
- The burden of HIV infection varies across the country. HIV prevalence among adults ages 15-64 years ranged from 4.9% in Central-East to 17.7% in Blantyre City.

6.2 Background

This chapter presents representative estimates of prevalence of HIV infection among adults ages 15-64 years at the national and zonal level by selected demographic and behavioral characteristics. It also presents HIV prevalence estimates among children ages 0-14 years at the national level and estimates of the number of HIV-positive persons living in Malawi. HIV prevalence 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 A describes the sample design and Appendix C provides estimates of sampling errors. Appendix B describes the PHIA HIV testing methodology.

6.3 Adult HIV Prevalence by Select Demographic Characteristics

Overall, HIV prevalence among adults ages 15-64 years was 10.6%: 8.5% in males, and 12.5% in females. Prevalence in urban areas was 14.2%, compared to 9.7% in rural areas (Table 6.3.A).

Among adults ages 15-64 years, HIV prevalence was 14.8% among those with no education, compared to 10.4% among those with more than secondary school education. HIV prevalence in females with no education was 16.5%, compared to 11.8% and 12.9% in those with secondary and more than secondary education, respectively. HIV prevalence in males with no education was 10.7%, compared with 6.8% among those with secondary education (Table 6.3.A).

Among those ages 15-64 years who have never married—a group dominated by younger segments of the population—the HIV prevalence was 2.4%. Among those who were married or living with a partner, HIV prevalence was 11.4%; in comparison, HIV prevalence was nearly twice as high (21.7%) among those who were divorced or separated and four times as high (43.9%) among those who were widowed (Table 6.3.A, Figure 6.3.A).

HIV prevalence among women ages 15-49 years who were pregnant at the time of the survey was estimated at 8.7%, compared to 12.5% among women who were not pregnant (Table 6.3.B).

Table 6.3.A HIV prevalence by demographic characteristics: Ages 15-64 years

Prevalence of HIV among persons age 15-64 years, by sex and selected demographic characteristics, MPHIA 2015-2016

Characteristic	Males		Females		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
Residence						
Urban	10.8	2,683	17.7	3,750	14.2	6,433
Rural	7.9	4,525	11.3	6,229	9.7	10,754
Zone						
North	6.0	1,017	8.7	1,301	7.4	2,318
Central-East	3.8	1,160	6.2	1,341	4.9	2,501
Central-West	5.7	860	6.4	1,149	6.1	2,009
Lilongwe City	8.5	1,265	14.8	1,729	11.5	2,994
South-East	12.5	742	17.4	1,210	15.3	1,952
South-West	13.1	1,050	18.4	1,682	16.0	2,732
Blantyre City	14.0	1,114	21.8	1,567	17.7	2,681
Marital status						
Never married	1.6	2,611	3.5	1,997	2.4	4,608
Married or living together	11.6	4,230	11.3	6,311	11.4	10,541
Divorced or separated	18.6	304	22.8	1,150	21.7	1,454
Widowed	51.4	53	43.1	510	43.9	563
Education						
No education	10.7	353	16.5	1,032	14.8	1,385
Primary	9.1	3,963	11.9	5,994	10.6	9,957
Secondary	6.8	2,473	11.8	2,559	8.9	5,032
More than secondary	9.0	417	12.9	387	10.4	804
Wealth quintile						
Lowest	9.9	769	12.5	1,202	11.3	1,971
Second	7.6	1,049	11.4	1,416	9.6	2,465
Middle	7.7	1,155	11.4	1,630	9.6	2,785
Fourth	8.5	1,568	11.6	2,032	10.1	3,600
Highest	9.1	2,667	15.1	3,699	12.1	6,366
Religion						
Catholic	6.6	1,486	10.2	1,916	8.4	3,402
CCAP[1]	7.9	1,422	10.4	1,875	9.2	3,297
Anglican	10.0	187	11.0	241	10.5	428
Seventh Day Adventist	9.2	484	14.0	746	11.7	1,230
Baptist	11.4	187	16.2	238	13.8	425
Other Christian	9.3	2,054	13.3	3,277	11.5	5,331
Muslim	6.7	632	14.7	925	11.1	1,557
Other	12.5	542	14.0	705	13.3	1,247
None	7.4	200	(12.5)	49	8.4	249
Ethnicity						
Chewa	5.5	2,493	7.3	3,217	6.4	5,710
Lomwe	15.9	1,345	19.3	2,033	17.7	3,378
Ngoni	9.3	873	13.6	1,265	11.6	2,138
Nkhonde	11.2	78	12.4	105	11.8	183
Sena	8.3	298	16.1	409	12.3	707
Tonga	8.2	125	8.6	208	8.4	333
Tumbuka	5.2	859	9.1	1,113	7.2	1,972
Yao	9.0	732	16.8	1,062	13.2	1,794
Other	10.1	395	16.9	549	13.6	944
Pregnancy status						
Currently pregnant	NA	NA	8.7	562	NA	NA
Not currently pregnant	NA	NA	12.9	9,292	NA	NA
Total 15-64	8.5	7,208	12.5	9,979	10.6	17,187

[1]Church of Central Africa Presbyterian.

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

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

Figure 6.3.A HIV prevalence by marital status: Ages 15-64 years, MPHIA 2015-2016

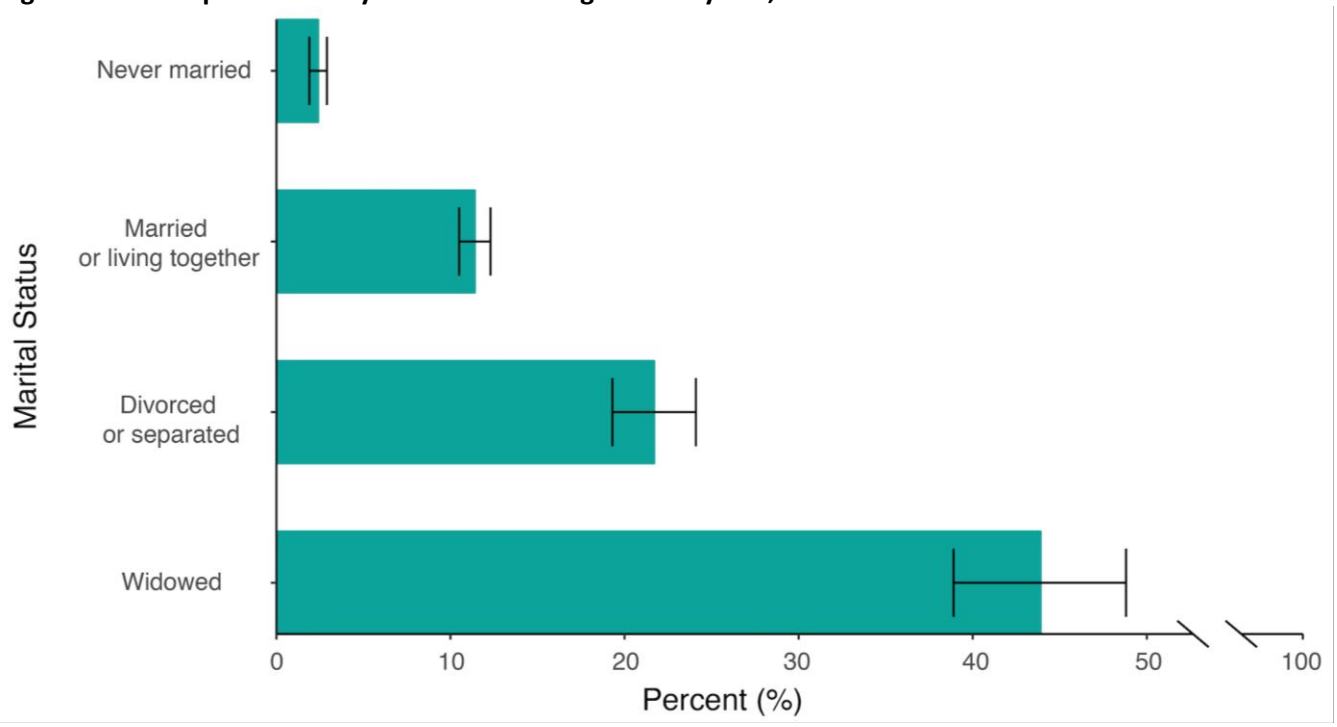


Table 6.3.B HIV prevalence by demographic characteristics: Ages 15-49 years

Prevalence of HIV among persons age 15-49 years, by sex and selected demographic characteristics, MPHIA 2015-2016

Characteristic	Males		Females		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
Residence						
Urban	9.9	2,439	17.3	3,470	13.5	5,909
Rural	7.2	3,867	10.9	5,479	9.1	9,346
Zone						
North	4.9	894	8.8	1,157	6.8	2,051
Central-East	3.4	987	5.8	1,207	4.6	2,194
Central-West	5.0	735	5.7	1,009	5.3	1,744
Lilongwe City	7.6	1,159	14.1	1,607	10.6	2,766
South-East	11.9	627	16.6	1,051	14.5	1,678
South-West	12.2	900	18.8	1,472	15.8	2,372
Blantyre City	13.0	1,004	21.6	1,446	17.1	2,450
Marital status						
Never married	1.5	2,596	3.5	1,960	2.3	4,556
Married or living together	11.1	3,412	11.7	5,713	11.4	9,125
Divorced or separated	19.1	262	23.2	996	22.1	1,258
Widowed	(59.0)	29	53.0	269	53.7	298
Education						
No education	10.0	258	17.6	750	15.3	1,008
Primary	8.5	3,348	11.6	5,343	10.2	8,691
Secondary	6.0	2,326	11.1	2,481	8.1	4,807
More than secondary	8.0	373	12.6	371	9.7	744
Wealth quintile						
Lowest	9.5	673	12.0	1,070	10.9	1,743
Second	7.6	907	11.2	1,245	9.4	2,152
Middle	6.7	985	10.9	1,426	8.9	2,411
Fourth	7.8	1,352	11.2	1,815	9.5	3,167
Highest	7.7	2,389	14.6	3,393	11.2	5,782
Religion						
Catholic	6.1	1,298	9.7	1,687	7.9	2,985
CCAP[1]	7.1	1,266	9.6	1,637	8.3	2,903
Anglican	10.3	165	11.5	215	10.9	380
Seventh Day Adventist	8.0	437	13.8	694	11.1	1,131
Baptist	10.3	163	17.6	218	13.9	381
Other Christian	8.2	1,789	13.0	2,971	10.9	4,760
Muslim	6.2	546	13.9	839	10.5	1,385
Other	12.3	473	14.0	637	13.1	1,110
None	7.2	158	(10.8)	44	7.9	202
Ethnicity						
Chewa	4.9	2,204	6.6	2,917	5.8	5,121
Lomwe	15.3	1,168	19.5	1,837	17.5	3,005
Ngoni	8.2	757	13.5	1,130	11.0	1,887
Nkhonde	9.6	68	12.2	95	10.9	163
Sena	7.4	265	16.7	360	12.1	625
Tonga	5.4	108	8.2	186	6.9	294
Tumbuka	4.8	756	8.9	986	6.8	1,742
Yao	8.5	638	15.6	940	12.4	1,578
Other	9.3	333	17.3	482	13.4	815
Pregnancy status						
Currently pregnant	NA	NA	8.7	562	NA	NA
Not currently pregnant	NA	NA	12.5	8,263	NA	NA
Total 15-49	7.8	6,306	12.1	8,949	10.0	15,255

[1]Church of Central Africa Presbyterian.

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

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

6.4 Adult HIV Prevalence by Age and Sex

In adults ages 15-64 years, HIV prevalence ranged from 1.5% among those ages 15-19 years to 21.7% in those ages 40-44 years. The peak HIV prevalence in females was 24.6%, observed in those ages 40-44 years, and the peak HIV prevalence in males was 22.1%, observed in those ages 45-49 years. Prevalence among females ages 15-24 years was 3.4%, compared to 13.6% among females ages 25-29 years (Table 6.4.A).

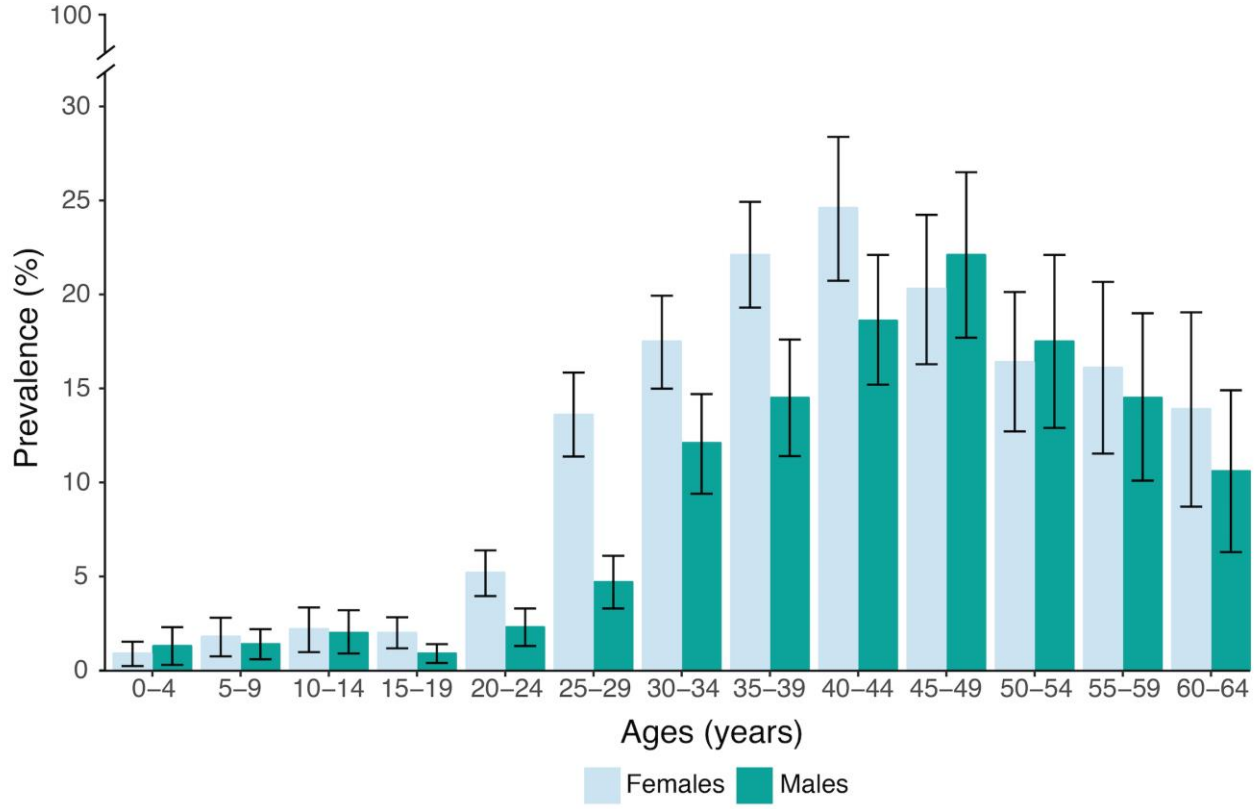
Differences in prevalence between males and females were significant in the ages 20-24 years, ages 25-29 years, ages 30-34 years, and ages 35-39 years. There were not significant differences by sex above age 39 years. Among young people ages 15-24 years, HIV prevalence was twice as high among females (3.4%) as among males (1.5%), and HIV prevalence among those ages 25-29 years was almost three times greater in females (13.6%) compared to males (4.7%; Table 6.4.A; Figure 6.4.A).

Table 6.4.A HIV prevalence by age and sex

Prevalence of HIV among persons age 0-64 years, by sex and age, MPHIA 2015-2016

	Males		Females		Total	
Age	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
0-17 months	0.0	230	0.7	266	0.4	496
18-59 months	1.7	664	0.9	707	1.4	1,371
5-9	1.4	1,057	1.8	1,144	1.6	2,201
10-14	2.0	1,054	2.2	1,043	2.1	2,097
Total 0-4	1.3	894	0.9	974	1.1	1,868
Total 0-14	1.5	3,005	1.5	3,161	1.5	6,166
15-19	0.9	1,497	2.0	1,646	1.5	3,143
20-24	2.3	1,181	5.2	1,934	3.8	3,115
25-29	4.7	938	13.6	1,511	9.3	2,449
30-34	12.1	870	17.5	1,425	14.9	2,295
35-39	14.5	765	22.1	1,097	18.4	1,862
40-44	18.6	609	24.6	785	21.7	1,394
45-49	22.1	446	20.3	551	21.2	997
50-54	17.5	355	16.4	469	16.9	824
55-59	14.5	295	16.1	326	15.4	621
60-64	10.6	252	13.9	235	12.4	487
Total 15-24	1.5	2,678	3.4	3,580	2.5	6,258
Total 15-49	7.8	6,306	12.1	8,949	10.0	15,255
Total 15-64	8.5	7,208	12.5	9,979	10.6	17,187

Figure 6.4.A HIV prevalence by age and sex, MPHIA 2015-2016



6.5 Adult HIV Prevalence by Zone

The burden of HIV infection varied across the country. HIV prevalence, among those 15-64 years, ranged from 4.9% in Central-East to 17.7% in Blantyre City (Figures 6.5.A and 6.5.B, Table 6.3.A). In the southern region of the country (South-East, South-West, and Blantyre City), HIV prevalence among females was statistically significantly higher than among males. In Blantyre City, prevalence in females ages 15-64 years was 21.8%, compared to 14.0% in their male peers (Table 6.3.A, Figure 6.5.A, Figure 6.5.B).

Figure 6.5.A HIV prevalence among adults aged 15-64 years, by zone, MPHIA 2015-2016

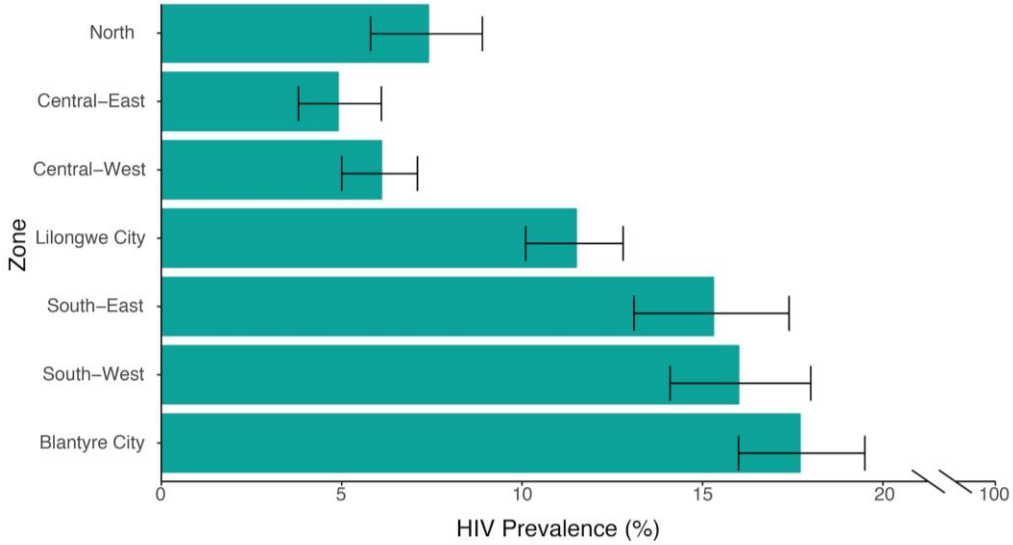
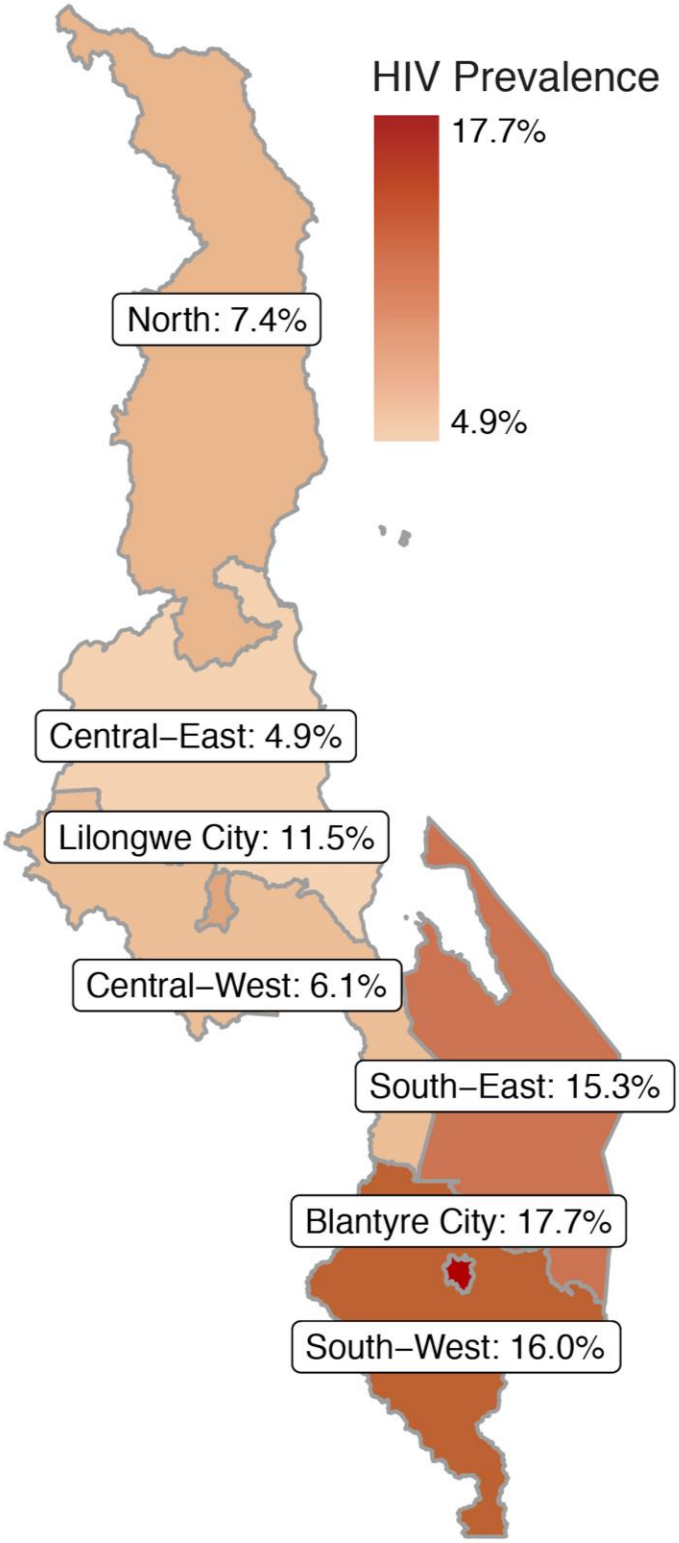


Figure 6.5.B HIV prevalence among adults aged 15-64 years, by zone, MPHIA 2015-2016



7 HIV TESTING

7.1 Key Findings

- In Malawi, 73.9% of the population ages 15-64 years had ever tested for HIV and received their results (81.6% of females and 65.6% of males).
- In Malawi, 35.9% of the population ages 15-64 years reported having had HIV testing and receiving results in the 12 months preceding the survey (39.3% of females and 32.2% of males).
- Among those ages 15-64 years who tested HIV positive in MPHIA, 7.7% reported that they had never been tested or that they had never received their results.
- If an HIV self-test kit were available in Malawi, 76.5% of males and 68.5% of females ages 15-64 years would use it.

7.2 Background

HIV testing is necessary for awareness of HIV status and is a critical 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 co-morbidities.

Data presented in this section pertain to adults ages 15-64 years, males and females, who self-reported ever receiving an HIV test and receiving the test results. Results on HIV testing in the last 12 months and receiving the test results are also presented to understand frequent or recent testing.

7.3 Self-Reported HIV Testing Among Adults

Overall, 73.9% of the population ages 15-64 years reported that they had ever tested for HIV and received their results, while 35.9% indicated that they had tested in the 12 months preceding the survey and received their results. Nearly two-thirds (65.6%) of males and 81.6% of females ages 15-64 years reported having ever tested for HIV and receiving their test results. For both males and females, about one-third tested for HIV in the year preceding the survey (32.2% among males and 39.3% among females) (Tables 7.3.A, 7.3.B, and 7.3.C).

Among males of most age groups, over two-thirds reported ever testing for HIV and receiving their results; however, only 33.2% of males ages 15-19 years reported ever testing for HIV and receiving results. The percentage of males testing for HIV and receiving results in the year preceding the survey ranged from 17.1% among those ages 15-19 years to 42.2% among those ages 25-29 years. Among females, 47.2% of those ages 15-19 years had ever been tested for HIV and received results, compared to over 90.0% among females ages 20-44 years. Among older females ages 45-64 years, percentages ever tested ranged from 59.0% among those ages 60-64 years to 85.1% among those ages 45-49 years. About one-half of women ages 20-24 years and ages 25-29 years (52.3% and 49.7%, respectively) were tested for HIV in the year preceding the survey (Tables 7.3.A and 7.3.B; Figure 7.3.A).

There was variation in lifetime and recent HIV testing by education status. Overall, among the adults ages 15-64 years, 76.6% of those with no education have ever tested for HIV and received their results and 32.6% tested in the year preceding the survey. Among those with more than secondary education, 85% reported ever testing and 39.2% reported testing in the year preceding the survey. Among males with more than secondary education, 82.8% reported having ever tested for HIV and receiving their results, compared to 63.4% of males with no education. Among females, percentages ever tested for HIV, and testing for HIV in the year preceding the survey, were highest among those with more than secondary education (89.1% and 43.9%, respectively; Tables 7.3.A, 7.3.B and 7.3.C).

Among males, about three-quarters of those who were married or cohabiting and divorced or separated (77.9% and 72.3%, respectively) reported ever testing for HIV. Percentages of testing were even higher among females: 92.1% of married or cohabiting females and 90.6% of divorced or separated females reported ever testing for HIV. Among both males and females, less than half of those who were never married had ever been tested (44.1% and 46.3%, respectively; Tables 7.3.A and 7.3.B).

Among those adults ages 15-64 years who tested HIV positive in MPHIA, 92.3% reported ever testing for HIV and receiving their results (88.3% among males and 94.7% among females). Among those testing negative in MPHIA, 63.0% of males and 79.1% of females reported ever testing for HIV. Among those who were not tested in MPHIA, 47.6% reported having tested for HIV in the year preceding the survey and receiving their results (40.8% among males and 53.7% among females; Tables 7.3.A, 7.3.B and 7.3.C).

Table 7.3.A Self-reported HIV testing: Males

Percentage of males ages 15-64 years who ever received HIV testing and received their test results, and percentage who received HIV testing and received their test results in the past 12 months, by result of PHIA survey HIV test and selected demographic characteristics, MPHIA 2015-2016

Characteristic	Percentage who ever received HIV testing and received results	Percentage who received HIV testing in the past 12 months and received results[1]	Number
Result of PHIA survey HIV test			
HIV positive	88.3	27.4	707
HIV negative	63.0	31.3	6,421
Not tested	68.4	40.8	1,056
Residence			
Urban	66.8	33.1	3,131
Rural	65.3	31.9	5,053
Zone			
North	68.6	34.0	1,095
Central-East	61.1	28.3	1,253
Central-West	63.8	33.1	944
Lilongwe City	67.5	34.4	1,448
South-East	66.9	31.9	896
South-West	66.5	32.8	1,206
Blantyre City	68.8	31.8	1,342
Marital status			
Never married	44.1	23.3	2,983
Married or living together	77.9	37.3	4,795
Divorced or separated	72.3	33.3	340
Widowed	81.7	41.7	56
Education			
No education	63.4	27.4	408
Primary	61.8	29.7	4,411
Secondary	70.9	37.2	2,822
More than secondary	82.8	36.7	541
Wealth quintile			
Lowest	66.1	34.3	862
Second	65.5	31.9	1,176
Middle	62.0	29.4	1,298
Fourth	65.1	32.9	1,728
Highest	68.5	32.8	3,120
Religion			
Catholic	66.1	33.5	1,624
CCAP[2]	66.6	31.8	1,624
Anglican	61.0	28.0	206
Seventh Day Adventist	69.0	35.8	556
Baptist	64.0	32.2	205
Other Christian	66.1	32.9	2,339
Muslim	63.7	33.4	742
Other	64.5	25.6	631
None	59.2	26.8	240
Ethnicity			
Chewa	62.7	31.6	2,773
Lomwe	70.8	32.8	1,586
Ngoni	64.8	30.3	1,000
Nkhonde	79.8	32.6	85
Sena	64.6	33.9	331
Tonga	59.0	29.8	152
Tumbuka	69.2	34.7	926
Yao	63.2	32.3	873
Other	69.1	31.7	447
Age			
15-19	33.2	17.1	1,666
20-24	66.2	38.7	1,366
25-29	78.3	42.2	1,105
30-34	82.3	39.5	995
35-39	78.3	37.6	868
40-44	77.6	33.7	696
45-49	74.7	29.1	498
50-54	70.1	25.2	390
55-59	67.0	24.9	326
60-64	65.2	25.9	274
Total 15-24	48.0	26.8	3,032
Total 15-49	65.3	33.0	7,194
Total 15-64	65.6	32.2	8,184

[1]Relates to PEPFAR HTC_TST.

[2]Church of Central Africa Presbyterian.

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

Table 7.3.B Self-reported HIV testing: Females

Percentage of females ages 15-64 years who ever received HIV testing and received their test results, and percentage who received HIV testing and received their test results in the past 12 months, by result of PHIA survey HIV test and selected demographic characteristics, MPHIA 2015-2016

Characteristic	Percentage who ever received HIV testing and received results	Percentage who received HIV testing in the past 12 months and received results[1]	Number
Result of PHIA survey HIV test			
HIV positive	94.7	20.5	1,503
HIV negative	79.1	39.7	8,440
Not tested	84.6	53.7	1,380
Residence			
Urban	83.3	41.1	4,228
Rural	81.2	38.9	7,095
Zone			
North	83.6	39.7	1,418
Central-East	76.6	36.0	1,486
Central-West	80.4	39.7	1,297
Lilongwe City	83.7	44.0	1,919
South-East	82.5	39.7	1,468
South-West	83.0	38.8	1,920
Blantyre City	84.2	40.9	1,815
Marital status			
Never married	46.3	25.0	2,233
Married or living together	92.1	44.8	7,228
Divorced or separated	90.6	41.6	1,280
Widowed	82.4	27.9	570
Education			
No education	81.6	34.5	1,239
Primary	81.3	39.4	6,731
Secondary	81.5	41.6	2,890
More than secondary	89.1	43.9	456
Wealth quintile			
Lowest	84.2	41.8	1,420
Second	81.8	39.6	1,619
Middle	82.1	40.1	1,824
Fourth	78.5	38.1	2,264
Highest	81.9	37.9	4,196
Religion			
Catholic	79.6	37.6	2,128
CCAP[2]	80.3	39.4	2,120
Anglican	77.0	39.6	275
Seventh Day Adventist	81.9	40.9	831
Baptist	82.6	42.5	268
Other Christian	83.8	39.7	3,728
Muslim	80.9	39.0	1,101
Other	81.3	40.1	800
None	82.7	34.8	63
Ethnicity			
Chewa	79.2	40.0	3,601
Lomwe	85.0	39.0	2,344
Ngoni	83.6	39.7	1,412
Nkhonde	87.0	38.2	117
Sena	77.0	36.4	472
Tonga	83.9	40.6	235
Tumbuka	82.8	39.9	1,209
Yao	81.5	37.6	1,284
Other	81.6	39.8	626
Age			
15-19	47.2	28.4	1,849
20-24	92.8	52.3	2,240
25-29	97.8	49.7	1,751
30-34	96.6	43.9	1,605
35-39	94.6	39.6	1,231
40-44	91.8	35.9	868
45-49	85.1	29.7	625
50-54	76.8	29.2	525
55-59	69.3	28.7	360
60-64	59.0	23.1	269
Total 15-24	67.9	39.3	4,089
Total 15-49	83.0	40.7	10,169
Total 15-64	81.6	39.3	11,323

[1]Relates to PEPFAR HTS_TST. [2]Church of Central Africa Presbyterian.

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

Table 7.3.C HIV testing: Total

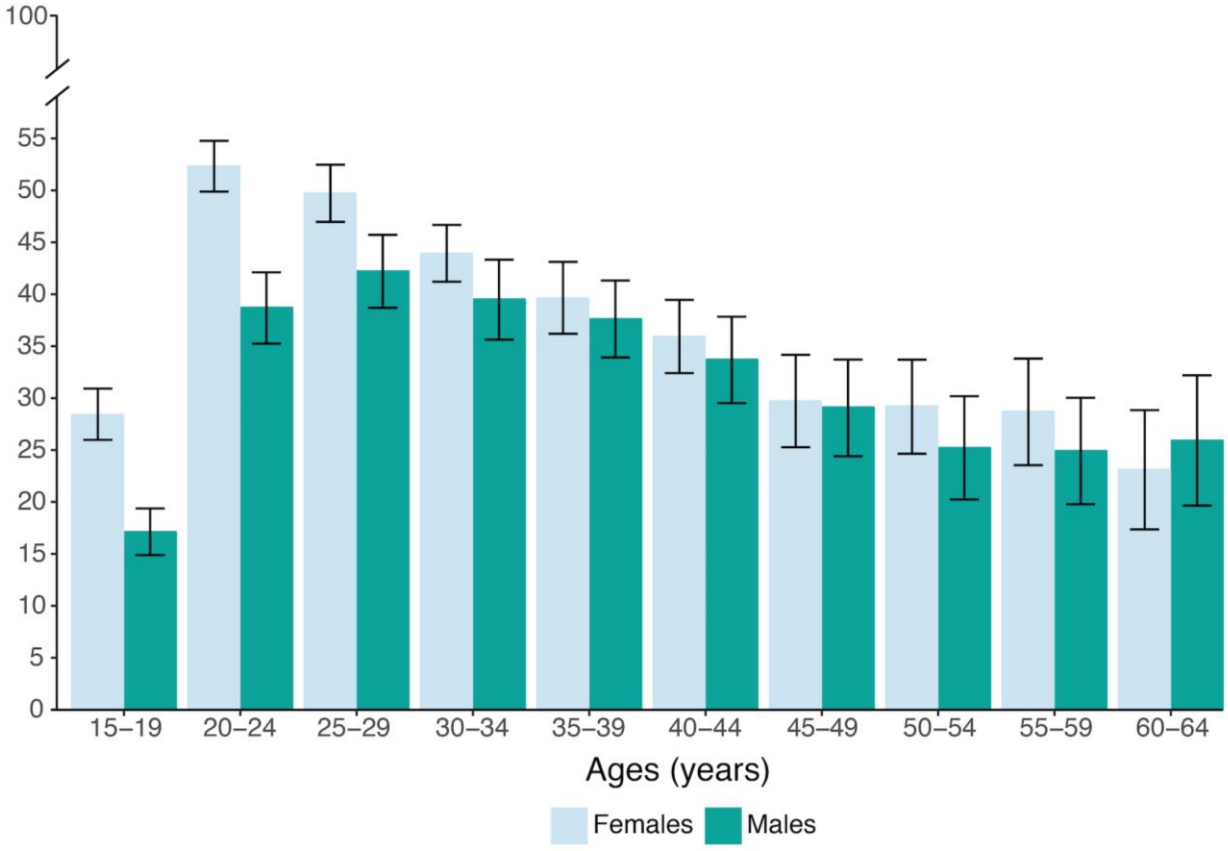
Percentage of persons ages 15-64 years who ever received HIV testing and received their test results, and percentage who received HIV testing and received their test results in the past 12 months, by result of PHIA survey HIV test and selected demographic characteristics, MPHIA 2015-2016

Characteristic	Percentage who ever received HIV testing and received their results	Percentage who received HIV testing in the past 12 months and received their results[1]	Number
Result of PHIA survey HIV test			
HIV positive	92.3	23.1	2,210
HIV negative	71.1	35.5	14,861
Not tested	76.9	47.6	2,436
Residence			
Urban	74.9	37.0	7,359
Rural	73.6	35.6	12,148
Zone			
North	76.0	36.8	2,513
Central-East	68.6	32.0	2,739
Central-West	72.3	36.5	2,241
Lilongwe City	75.2	39.0	3,367
South-East	75.7	36.3	2,364
South-West	75.6	36.1	3,126
Blantyre City	76.3	36.3	3,157
Marital status			
Never married	45.0	24.0	5,216
Married or living together	85.4	41.2	12,023
Divorced or separated	86.4	39.7	1,620
Widowed	82.4	29.1	626
Education			
No education	76.6	32.6	1,647
Primary	72.3	34.9	11,142
Secondary	75.3	39.0	5,712
More than secondary	85.0	39.2	997
Wealth quintile			
Lowest	76.3	38.5	2,282
Second	73.9	35.9	2,795
Middle	72.5	34.9	3,122
Fourth	71.9	35.5	3,992
Highest	75.2	35.3	7,316
Religion			
Catholic	73.0	35.6	3,752
CCAP[2]	73.4	35.6	3,744
Anglican	69.0	33.9	481
Seventh Day Adventist	75.8	38.5	1,387
Baptist	73.4	37.4	473
Other Christian	75.8	36.6	6,067
Muslim	73.3	36.6	1,843
Other	72.6	32.6	1,431
None	63.3	28.2	303
Ethnicity			
Chewa	70.9	35.8	6,374
Lomwe	78.3	36.1	3,930
Ngoni	74.7	35.2	2,412
Nkhonde	83.5	35.5	202
Sena	71.1	35.2	803
Tonga	72.0	35.4	387
Tumbuka	76.0	37.3	2,135
Yao	73.4	35.2	2,157
Other	75.7	36.0	1,073
Age			
15-19	40.4	22.9	3,515
20-24	79.9	45.7	3,606
25-29	88.4	46.1	2,856
30-34	89.7	41.8	2,600
35-39	86.7	38.7	2,099
40-44	84.9	34.8	1,564
45-49	80.1	29.4	1,123
50-54	73.5	27.3	915
55-59	68.2	26.9	686
60-64	61.9	24.4	543
Total 15-24	58.2	33.2	7,121
Total 15-49	74.5	37.0	17,363
Total 15-64	73.9	35.9	19,507

[1]Relates to PEPFAR HTC_TST. [2]Church of Central Africa Presbyterian.

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

Figure 7.3.A Proportion of adults who self-reported having received an HIV test in the last 12 months, by age and sex, MPHIA 2015-2016



7.4 Self-Reported HIV Status Among Adults Who Tested HIV Positive During the Survey

Among those ages 15-64-years who tested HIV positive in MPHIA, 72.9% self-reported their HIV-positive status: 76.0% of females were aware of their HIV-positive status, while 68.1 of males were aware of their HIV-positive status (Table 7.4.A).

Among those ages 15-64-years who tested HIV positive in MPHIA, 18.3% self-reported an HIV-negative status, and 8.8% reported that they had never been tested or had never received their result. Approximately twice as many HIV-positive men reported never having been tested for HIV or never receiving their HIV test results (12.6%) compared to HIV-positive women (6.4%) (Table 7.4.A).

There was variation in awareness of HIV-positive status across geographic zones: self-reported awareness of HIV-positive status ranged from 66.5% in the Central-East to 76.5% in the South-West. About one in eight HIV-positive individuals from Blantyre (12.4%) and Central-East (12.2%) reported that they had never tested for HIV or had never received their HIV test results, compared to a range of 6.2% to 8.7% in the other zones (Table 7.4.A).

Table 7.4.A Self-reported HIV status among adults who tested HIV positive during the survey

Percent distribution of adults ages 15-64 years who tested HIV positive during the survey by self-reported HIV status, by selected demographic characteristics, MPHIA 2015-2016

Characteristic	Ever tested for HIV		Self-reported never tested or never received result	Total	Number
	Self-reported HIV positive	Self-reported HIV negative			
Sex					
Male	68.1	19.3	12.6	100.0	713
Female	76.0	17.6	6.4	100.0	1,508
Zone					
North	72.8	21.0	6.2	100.0	182
Central-East	66.5	21.3	12.2	100.0	129
Central-West	70.1	21.9	8.1	100.0	138
Lilongwe City	70.1	21.1	8.7	100.0	399
South-East	75.4	16.2	8.4	100.0	336
South-West	76.5	15.4	8.1	100.0	497
Blantyre City	67.5	20.1	12.4	100.0	540
Total 15-49	71.9	19.7	8.4	100.0	1,880
Total 15-64	72.9	18.3	8.8	100.0	2,221

7.5 Willingness to Use HIV Self-Testing if Available in the Country

Among men ages 15-64 years, 76.5% reported that they would use an HIV self-test kit if available in Malawi. Eighty percent (80.0%) of men who reside in urban areas compared to 75.5% of men who reside in rural areas reported that they would use self-testing for HIV. In Blantyre City, 83.0% of men reported they would use an HIV self-test kit, the highest percentage among the zones. The percentage willing to use self-tests for HIV among adult men was 81.3% among those in the highest quintile of wealth compared to 71.4% among those in the lowest quintile. It was 88.4% among those with more than secondary education compared to 64.8% among those with no education. The percentage of men willing to use a self-test for HIV was lowest among those ages 15-19 years (68.1%) and highest among those ages 30-34 years (81.3%) (Table 7.5.A).

Among women ages 15-64 years, 68.5% reported that they would use an HIV self-test kit if available in Malawi. Similar to men, 83.2% of women in Blantyre City reported they would use an HIV self-test kit, the highest percentage among the zones, with higher willingness to self-test reported among those residing in urban areas compared to those in rural areas (79.0% versus 66.1%, respectively). Willingness to use HIV self-test kits among women ages 15-64 years was reported by 81.5% of those in the highest quintile of wealth compared to 60.5% of those in the lowest wealth quintile, and by 91.9% of women with more than secondary education, compared to 53.3% of those with no education. The percentage who reported that they would use an HIV self-test kit was 75.4% among women ages 25-29 years, 61.6% among women ages 15-19 years, and 54.6% among women ages 60-64 years (Table 7.5.B).

Table 7.5.A Self-testing: Males

Among adults ages 15-64 years, percentage who reported that they would use an HIV self-test kit if available in the country, by selected demographic characteristics, MPHIA 2015-2016

Characteristic	Percentage who would use an HIV self-test kit if available in the country	Number
Residence		
Urban	80.0	3,156
Rural	75.5	5,095
Zone		
North	80.1	1,103
Central-East	73.5	1,268
Central-West	69.8	948
Lilongwe City	78.3	1,458
South-East	79.7	904
South-West	78.1	1,215
Blantyre City	83.0	1,355
Marital status		
Never married	73.0	2,996
Married or living together	78.6	4,842
Divorced or separated	77.6	344
Widowed	75.9	58
Education		
No education	64.8	411
Primary	73.3	4,448
Secondary	83.0	2,850
More than secondary	88.4	540
Wealth quintile		
Lowest	71.4	873
Second	74.4	1,184
Middle	75.3	1,306
Fourth	76.7	1,746
Highest	81.3	3,142
Religion		
Catholic	76.6	1,643
CCAP[1]	78.6	1,628
Anglican	73.0	208
Seventh Day Adventist	83.1	560
Baptist	76.6	205
Other Christian	76.4	2,363
Muslim	77.3	746
Other	70.2	637
None	68.2	244
Ethnicity		
Chewa	72.0	2,792
Lomwe	81.6	1,600
Ngoni	78.5	1,006
Nkhonde	77.9	85
Sena	76.0	334
Tonga	81.3	154
Tumbuka	78.8	937
Yao	77.8	880
Other	78.1	452
Age		
15-19	68.1	1,672
20-24	78.2	1,385
25-29	78.5	1,119
30-34	81.3	1,004
35-39	79.1	875
40-44	79.6	700
45-49	79.6	500
50-54	77.1	393
55-59	73.8	329
60-64	75.7	274
Total 15-24	72.6	3,057
Total 15-64	76.5	8,251

[1]Church of Central Africa Presbyterian.

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

Table 7.5.B Self-testing: Females

Among adults ages 15-64 years, percentage who reported that they would use an HIV self-test kit if available in the country, by selected demographic characteristics, MPHIA 2015-2016

Characteristic	Percentage who would use an HIV self-test kit if available in the country	Number
Residence		
Urban	79.0	4,217
Rural	66.1	7,036
Zone		
North	75.0	1,411
Central-East	63.7	1,477
Central-West	61.0	1,285
Lilongwe City	77.8	1,917
South-East	67.8	1,449
South-West	69.1	1,905
Blantyre City	83.2	1,809
Marital status		
Never married	65.7	2,226
Married or living together	69.3	7,181
Divorced or separated	70.4	1,273
Widowed	67.2	562
Education		
No education	53.3	1,222
Primary	66.3	6,680
Secondary	82.6	2,886
More than secondary	91.9	459
Wealth quintile		
Lowest	60.5	1,407
Second	62.2	1,602
Middle	63.7	1,804
Fourth	70.2	2,252
Highest	81.5	4,188
Religion		
Catholic	69.1	2,128
CCAP[1]	72.3	2,108
Anglican	69.5	274
Seventh Day Adventist	74.9	828
Baptist	61.8	267
Other Christian	67.9	3,693
Muslim	67.8	1,087
Other	60.3	796
None	51.4	63
Ethnicity		
Chewa	63.5	3,585
Lomwe	72.4	2,327
Ngoni	74.7	1,404
Nkhonde	73.8	117
Sena	60.2	468
Tonga	72.8	233
Tumbuka	76.2	1,203
Yao	67.3	1,270
Other	67.8	624
Age		
15-19	61.6	1,838
20-24	70.3	2,232
25-29	75.4	1,743
30-34	74.1	1,598
35-39	70.0	1,223
40-44	71.5	863
45-49	66.3	616
50-54	61.6	521
55-59	66.2	358
60-64	54.6	261
Total 15-24	65.5	4,070
Total 15-64	68.5	11,253

[1]Church of Central Africa Presbyterian.

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

7.6 Gaps and Unmet Needs

- Although the majority of the population have tested for HIV at some point in their lives, the frequency of recent testing was low. There is need to ensure that people at risk of acquiring HIV are tested at least annually.
- There is an important deficit in reaching males with HIV testing services.
- The majority of men and women reported that they would use an HIV self-test kit if available in country. Acceptability was particularly high in Blantyre City where HIV prevalence is also high.

8 HIV Diagnosis and Treatment

8.1 Key Findings

- Based on self-reporting, among HIV-positive adults ages 15-64 years, 27.2% were unaware of their HIV-positive status (approximately one-third (32.0%) of males and one-quarter (24.1%) of females).
- Overall, 65.3% of HIV-positive adults ages 15-64 years reported awareness of their status and ART use.
- Concordance between self-report of ART and detection of ARVs was high among adults ages 15-64 years, with 96.4% of those who reported current ART use having detectable ARVs in blood. However, self-report of HIV status was less accurate, with detection of ARVs in blood among 14.8% of those who reported that they had not been previously diagnosed with HIV.

8.2 Background

Recent studies have proven that treating PLHIV at higher CD4 counts improves immune recovery, decreases the incidence of non-AIDS events and comorbidities and mortality, and reduces sexual and vertical transmission. In 2016, after extensive review of evidence of both the clinical and population-level benefits of expanding ART, the WHO changed their recommendation to support a policy of "Treatment for All', regardless of CD4 count.[1,2] By November 2017, almost all countries in sub-Saharan Africa had adopted this policy, despite the challenges in ensuring uptake and implementation.[2] This policy was adopted in Malawi in May 2016.

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

Among HIV-positive adults ages 15-64 years, based on self-report, 27.2% were unaware of their HIV-positive status (one-third (32.0%) of males and one-quarter (24.1%) of females). Overall, 65.3% of HIV-positive adults reported awareness of their HIV status and ART use. Over half (58.7%) of HIV-positive males were aware of their status and on ART, while 69.5% of HIV-positive females were on ART. Among urban, HIV-positive males ages 15-64 years, 39.6% were unaware of their HIV status, compared to 29.2% among those in rural areas. Awareness of HIV status among females did not vary by residence with 25.7% and 23.6% aware among those residing in urban and rural areas, respectively (Tables 8.3.A, 8.3.B, and 8.3.C, Figure 8.3.A).

Among HIV-positive males, the percentage of those who were unaware of their HIV status ranged from 66.7% among those ages 20-24 years to 14.4% among those ages 60-64-years. Among HIV-positive females, the percentage unaware of their HIV status ranged from 58.3% among those ages 15-19 years to 14.2% among those ages 40-44 years. The percentage of HIV-positive males who reported ART use ranged from 23.1% among those ages 20-24 years to 75.0% among those ages 60-64 years, while the percentage of HIV-positive females who reported being on ART ranged from 37.4% among those ages 15-19 years to 79.9% among those ages 40-44 years (Tables 8.3.A and 8.3.B, Figure 8.3.A).

Among married and cohabiting HIV-positive adults ages 15-64 years, 64.9% were aware of their status and on ART, 59.9% of males and 69.5% of females, while among those who had never married, 42.1% were aware and on ART, 36.7% of males and 46.1% of females (Tables 8.3.A, 8.3.B and 8.3.C).

Overall, among HIV-positive adults ages 15-64 years, the percentage unaware of their status varied from 23.5% in South-West to 33.5% in the Central-East zone. By demographic category, the percentage unaware of their status was notably high among those never married (51.0%), among those belonging to the Tonga (39.2), Sena (34.7%), and Ngoni (34.0%) ethnicities, and among those ages 15-19 years (57.2%) (Table 8.3.C).

Among HIV-positive adults ages 15-64 years, 8.1% of those residing in urban areas reported being aware of their status. but not receiving ART. The percentages of those reporting awareness of their status but not receiving ART were highest in Lilongwe (9.9%) and Blantyre (9.2%) cities, among those divorced or separated (9.5%), those belonging to the Lomwe ethnicity (9.2%), and among those ages 20-24 years (10.2%) and ages 25-29 years (11.2%).

Among all HIV-positive adults, the percentage reporting awareness of their HIV status and receiving ART was 58.2% in Blantyre City, 59.9% in Lilongwe City, (the main urban zones), compared to 69.2% in the Southwest and 68.9% in the North zone

Percentages of those reporting ART use were also lowest among the never married (42.1%), those in the lowest wealth quintile (59.4%), and the youngest adults (less than 60% for those less than 30 years of age). Only 37.3% of those HIV positive ages 15-19 years, 42.8% of those ages 20-24 years, and 53.5% of those ages 25-29 years reported ART use (Table 8.3.C; Figure 8.3.A)

Table 8.3.A HIV treatment status: Males

Percent distribution of HIV-positive males age 15-64 years by self-reported ART status, by selected demographic characteristics, MPHIA 2015-2016

Characteristic	Unaware of HIV status	Aware of HIV status		Total	Number
		Not on ART	On ART[1]		
Residence					
Urban	39.6	8.9	51.5	100.0	324
Rural	29.2	9.4	61.3	100.0	387
Zone					
North	27.3	3.2	69.6	100.0	67
Central-East	(35.8)	(7.1)	(57.0)	(100.0)	45
Central-West	32.9	12.7	54.4	100.0	56
Lilongwe City	38.8	10.6	50.7	100.0	118
South-East	29.3	10.8	59.9	100.0	104
South-West	29.8	8.1	62.1	100.0	150
Blantyre City	38.7	10.7	50.6	100.0	171
Marital status					
Never married	57.7	5.6	36.7	100.0	56
Married or living together	30.6	9.5	59.9	100.0	565
Divorced or separated	32.3	8.7	58.9	100.0	61
Widowed	(11.9)	(13.8)	(74.3)	(100.0)	29
Education					
No education	(42.1)	(8.4)	(49.6)	(100.0)	44
Primary	31.3	9.6	59.1	100.0	427
Secondary	30.8	9.4	59.8	100.0	202
More than secondary	(33.7)	(5.1)	(61.3)	(100.0)	38
Wealth quintile					
Lowest	47.7	11.5	40.8	100.0	81
Second	30.3	10.9	58.8	100.0	81
Middle	29.5	12.3	58.2	100.0	102
Fourth	23.2	7.9	68.9	100.0	156
Highest	32.9	6.1	61.1	100.0	291
Religion					
Catholic	33.1	6.0	60.9	100.0	127
CCAP[2]	36.1	9.4	54.5	100.0	136
Anglican	*	*	*	*	14
Seventh Day Adventist	(41.3)	(7.5)	(51.2)	(100.0)	48
Baptist	*	*	*	*	22
Other Christian	30.5	9.1	60.3	100.0	224
Muslim	25.0	11.1	64.0	100.0	51
Other	28.5	9.7	61.8	100.0	72
None	*	*	*	*	16
Ethnicity					
Chewa	34.3	11.7	54.0	100.0	164
Lomwe	27.3	13.1	59.6	100.0	230
Ngoni	42.3	4.9	52.8	100.0	96
Nkhonde	*	*	*	*	10
Sena	(49.0)	(0)	(50.9)	(100.0)	25
Tonga	*	*	*	*	12
Tumbuka	25.7	3.4	70.9	100.0	51
Yao	31.0	9.2	59.9	100.0	77
Other	(23.6)	(3.8)	(72.7)	(100.0)	46
Age					
15-19	*	*	*	*	15
20-24	(66.7)	(10.2)	(23.1)	(100.0)	29
25-29	(51.3)	(16.9)	(31.7)	(100.0)	49
30-34	36.3	15.1	48.6	100.0	110
35-39	32.0	8.4	59.6	100.0	121
40-44	27.3	5.3	67.4	100.0	126
45-49	18.9	10.1	71.1	100.0	106
50-54	24.3	1.9	73.8	100.0	70
55-59	25.0	4.2	70.7	100.0	50
60-64	(14.4)	(10.7)	(75.0)	(100.0)	35
Total 15-24	(62.9)	(9.5)	(27.6)	(100.0)	44
Total 15-49	34.0	10.4	55.6	100.0	556
Total 15-64	32.0	9.3	58.7	100.0	711

[1]Relates to Global AIDS Monitoring indicator 1.3: People living with HIV on antiretroviral therapy. [2]Church of Central Africa Presbyterian.

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

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

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

Table 8.3.B HIV treatment status: Females

Percent distribution of HIV-positive females age 15-64 years by self-reported antiretroviral therapy (ART) status, by selected demographic characteristics, MPHIA 2015

Characteristic	Unaware of HIV status	Aware of HIV status		Total	Number
		Not on ART	On ART[1]		
Residence					
Urban	25.7	7.6	66.7	100.0	731
Rural	23.6	6.0	70.5	100.0	772
Zone					
North	27.3	4.2	68.5	100.0	114
Central-East	32.0	6.8	61.1	100.0	84
Central-West	27.6	5.3	67.1	100.0	81
Lilongwe City	24.7	9.6	65.7	100.0	279
South-East	22.1	5.5	72.4	100.0	231
South-West	19.9	6.8	73.3	100.0	345
Blantyre City	28.2	8.2	63.6	100.0	369
Marital status					
Never married	46.1	7.8	46.1	100.0	99
Married or living together	25.0	5.5	69.5	100.0	853
Divorced or separated	22.0	9.7	68.3	100.0	308
Widowed	16.0	4.9	79.2	100.0	241
Education					
No education	19.4	5.8	74.8	100.0	196
Primary	22.5	7.0	70.5	100.0	884
Secondary	33.9	5.5	60.6	100.0	369
More than secondary	18.4	2.4	79.2	100.0	52
Wealth quintile					
Lowest	22.0	6.9	71.1	100.0	170
Second	21.4	7.4	71.3	100.0	178
Middle	23.2	6.6	70.2	100.0	206
Fourth	22.6	4.2	73.2	100.0	270
Highest	28.6	7.0	64.4	100.0	679
Religion					
Catholic	20.3	5.3	74.4	100.0	246
CCAP[2]	27.6	4.4	67.9	100.0	267
Anglican	(22.9)	(4.9)	(72.2)	(100.0)	29
Seventh Day Adventist	24.5	7.6	67.9	100.0	132
Baptist	(18.5)	(15.3)	(66.2)	(100.0)	44
Other Christian	22.8	6.7	70.5	100.0	509
Muslim	28.8	7.0	64.2	100.0	152
Other	27.3	3.9	68.7	100.0	113
None	*	*	*	*	10
Ethnicity					
Chewa	25.7	5.6	68.7	100.0	303
Lomwe	21.1	6.5	72.4	100.0	454
Ngoni	28.9	6.8	64.3	100.0	212
Nkhonde	*	*	*	*	14
Sena	27.8	5.5	66.7	100.0	76
Tonga	*	*	*	*	23
Tumbuka	25.3	5.9	68.8	100.0	115
Yao	23.6	8.7	67.7	100.0	200
Other	16.5	4.8	78.7	100.0	103
Age					
15-19	(58.3)	(4.3)	(37.4)	(100.0)	37
20-24	38.6	10.2	51.2	100.0	132
25-29	30.2	9.3	60.5	100.0	217
30-34	25.5	5.4	69.1	100.0	293
35-39	19.4	6.6	74.0	100.0	293
40-44	14.2	5.9	79.9	100.0	215
45-49	18.3	3.1	78.6	100.0	132
50-54	27.4	4.1	68.5	100.0	91
55-59	14.6	8.2	77.2	100.0	58
60-64	(18.2)	(3.2)	(78.6)	(100.0)	35
Total 15-24	44.7	8.4	46.9	100.0	169
Total 15-49	24.6	6.6	68.8	100.0	1,319
Total 15-64	24.1	6.4	69.5	100.0	1,503

[1]Relates to Global AIDS Monitoring indicator 1.3: People living with HIV on antiretroviral therapy.

[2]Church of Central Africa Presbyterian.

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

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

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

Table 8.3.C HIV treatment status: Total

Percent distribution of HIV-positive persons ages 15-64 years by self-reported HIV diagnosis and antiretroviral therapy (ART) status, by selected demographic characteristics, MPHIA 2015-2016

Characteristic	Unaware of HIV status	Aware of HIV status		Total	Number
		Not on ART	On ART[1]		
Residence					
Urban	31.1	8.1	60.8	100.0	1,055
Rural	25.8	7.3	66.9	100.0	1,159
Zone					
North	27.3	3.8	68.9	100.0	181
Central-East	33.5	6.9	59.5	100.0	129
Central-West	30.1	8.7	61.2	100.0	137
Lilongwe City	30.1	9.9	59.9	100.0	397
South-East	24.7	7.5	67.8	100.0	335
South-West	23.5	7.3	69.2	100.0	495
Blantyre City	32.5	9.2	58.2	100.0	540
Marital status					
Never married	51.0	6.9	42.1	100.0	155
Married or living together	27.7	7.4	64.9	100.0	1,418
Divorced or separated	24.1	9.5	66.4	100.0	369
Widowed	15.5	5.9	78.6	100.0	270
Education					
No education	24.0	6.4	69.6	100.0	240
Primary	26.0	8.0	65.9	100.0	1,311
Secondary	32.5	7.3	60.2	100.0	571
More than secondary	26.8	3.9	69.3	100.0	90
Wealth quintile					
Lowest	31.9	8.7	59.4	100.0	251
Second	24.8	8.7	66.4	100.0	259
Middle	25.6	8.8	65.6	100.0	308
Fourth	22.9	5.8	71.4	100.0	426
Highest	30.2	6.6	63.2	100.0	970
Religion					
Catholic	25.3	5.6	69.2	100.0	373
CCAP[2]	31.2	6.6	62.2	100.0	403
Anglican	(24.2)	(3.3)	(72.5)	(100.0)	43
Seventh Day Adventist	30.6	7.6	61.8	100.0	180
Baptist	25.9	14.0	60.1	100.0	66
Other Christian	25.7	7.6	66.7	100.0	733
Muslim	27.7	8.1	64.2	100.0	203
Other	27.9	6.8	65.3	100.0	185
None	(18.8)	(30.5)	(50.7)	(100.0)	(26
Ethnicity					
Chewa	29.5	8.3	62.2	100.0	467
Lomwe	23.7	9.2	67.1	100.0	684
Ngoni	34.0	6.1	59.9	100.0	308
Nkhonde	*	*	*	*	24
Sena	34.7	3.7	61.6	100.0	101
Tonga	(39.2)	(5.1)	(55.8)	(100.0)	35
Tumbuka	25.5	5.0	69.6	100.0	166
Yao	25.9	8.8	65.3	100.0	277
Other	19.0	4.4	76.6	100.0	149
Age					
15-19	57.2	5.4	37.3	100.0	52
20-24	47.0	10.2	42.8	100.0	161
25-29	35.3	11.2	53.5	100.0	266
30-34	29.7	9.2	61.1	100.0	403
35-39	24.2	7.3	68.5	100.0	414
40-44	19.6	5.7	74.8	100.0	341
45-49	18.6	6.7	74.8	100.0	238
50-54	25.8	3.0	71.2	100.0	161
55-59	19.2	6.4	74.4	100.0	108
60-64	16.7	6.1	77.1	100.0	70
Total 15-24	50.2	8.7	41.1	100.0	213
Total 15-49	28.2	8.0	63.8	100.0	1,875
Total 15-64	27.2	7.5	65.3	100.0	2,214

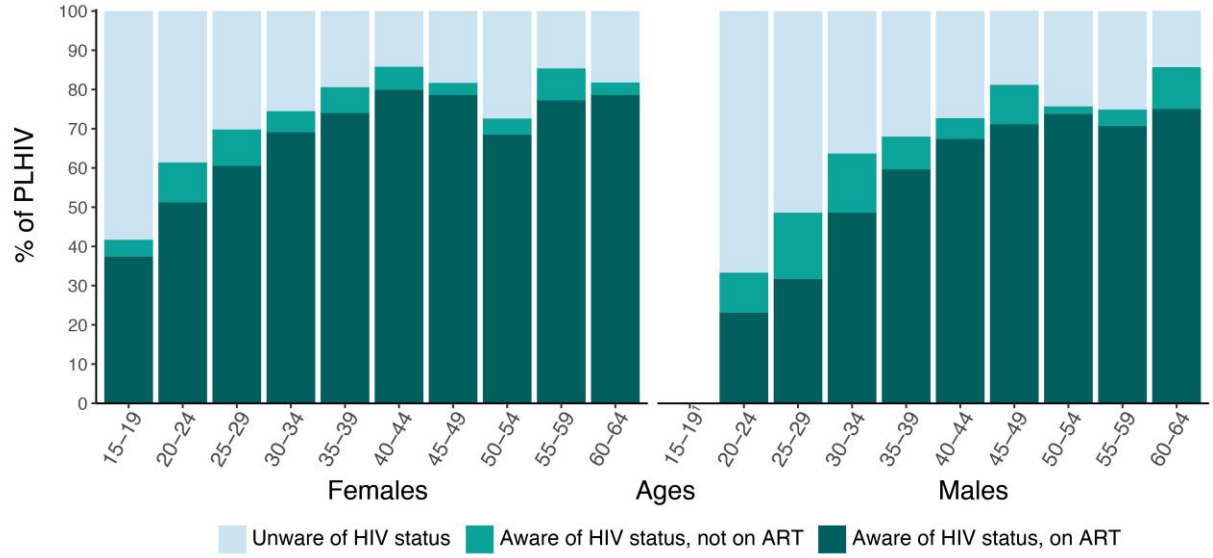
[1]Relates to Global AIDS Monitoring indicator 1.2: People living with HIV on antiretroviral therapy and PEPFAR TX_CURR_NAT / SUBNAT. [2]Church of Central Africa Presbyterian.

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

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

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

Figure 8.3.A Proportion of HIV-positive adults ages 15-64 years self-reporting awareness of HIV status and antiretroviral therapy status, by age and sex, MPHIA 2015-2016



[1] Estimate is based on a very small number of unweighted cases (less than 25) and has been suppressed.

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

MPHIA determined the presence of four ARVs in blood (atazanavir, efavirenz, lopinavir, and nevirapine) as markers of first- and second-line regimes prescribed in the country at the time of the survey. Overall, ARVs were detected in 68.0% of HIV-positive adults ages 15-64 years. Among those who reported current use of ART, ARVs were detected in 96.4% of adults in this age group (96.6% of males and 96.3% of females). Among those who reported to be previously diagnosed with HIV, but not on ART, 12.0% had ARVs detected in blood (13.3% of males and 10.9% of females). Among those who reported that they had not been previously diagnosed, 14.8% had ARVs detected in blood (11.4% among males and 17.5% among females) (Tables 8.4.A, 8.4.B and 8.4.C).

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

Percent distribution of HIV-positive males ages 15-64 years by presence of detectable ARVs versus self-reported HIV treatment status, MPHIA 2015-2016

Characteristic	ARVs[1]		Total	Number
	Not detectable	Detectable		
Self-reported treatment status				
Not previously diagnosed	88.6	11.4	100.0	226
Previously diagnosed, not on ART[2]	86.7	13.3	100.0	60
Previously diagnosed, on ART	3.4	96.6	100.0	419
Total 15-24	(64.9)	(35.1)	(100.0)	43
Total 15-49	41.0	59.0	100.0	552
Total 15-64	37.9	62.1	100.0	706

[1]Antiretroviral detection assay included only atazanavir, efavirenz, and lopinavir. Participants who reported antiretroviral therapy use and/or had undetectable viral load but had no evidence of the first three ARVs were tested for nevirapine as well.

[2] ART: Antiretroviral therapy

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

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

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

Percent distribution of HIV-positive females ages 15-64 years by presence of detectable ARVs versus self-reported HIV treatment status, MPHIA 2015-2016

Characteristic	ARVs[1]		Total	Number
	Not detectable	Detectable		
Self-reported treatment status				
Not previously diagnosed	82.5	17.5	100.0	349
Previously diagnosed, not on ART[2]	89.1	10.9	100.0	110
Previously diagnosed, on ART	3.7	96.3	100.0	1,030
Total 15-24	54.7	45.3	100.0	168
Total 15-49	28.8	71.2	100.0	1,309
Total 15-64	28.2	71.8	100.0	1,492

[1]Antiretroviral detection assay included only atazanavir, efavirenz, and lopinavir. Participants who reported antiretroviral therapy use and/or had undetectable viral load but had no evidence of the first three ARVs were tested for nevirapine as well.

[2] ART: Antiretroviral therapy

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

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

Percent distribution of HIV-positive persons ages 15-64 years by presence of detectable ARVs versus self-reported HIV treatment status, MPHIA 2015-2016

Characteristic	ARVs[1]		Total	Number
	Not detectable	Detectable		
Self-reported treatment status				
Not previously diagnosed	85.2	14.8	100.0	575
Previously diagnosed, not on ART[2]	88.0	12.0	100.0	170
Previously diagnosed, on ART	3.6	96.4	100.0	1,449
Total 15-24	57.7	42.3	100.0	211
Total 15-49	33.4	66.6	100.0	1,861
Total 15-64	32.0	68.0	100.0	2,198

[1]Antiretroviral detection assay included only atazanavir, efavirenz, and lopinavir. Participants who reported antiretroviral therapy use and/or had undetectable viral load but had no evidence of the first three ARVs were tested for nevirapine as well.

[2] ART: Antiretroviral therapy

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

8.5 Gaps and Unmet Needs

- There is a major gap in reaching and diagnosing those living with HIV, particularly men and all individuals ages 15-24 years.
- Of all HIV-positive individuals ages 15-24 years, 60% were not on ART.

8.6 References

1. World Health Organization (2016). *Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection*. Retrieved from WHO: http://apps.who.int/iris/bitstream/handle/10665/208825/9789241549684_eng.pdf;jsessionid=D8D5E2BB12AEEB9347F82EC8C1ACA09F?sequence=1

2. World Health Organization (2017). *Treat all: policy adoption and implementation status in countries*. Retrieved from WHO: http://www.who.int/hiv/pub/arv/treat-all-uptake/en/

9 VIRAL LOAD SUPPRESSION

9.1 Key Findings

- In Malawi, 68.3% of HIV-positive adults ages 15-64 years are virally suppressed, 60.9% among males and 73.1% among females.
- The percentage of HIV-positive adults ages 15-64 years who are virally suppressed ranged from 59.5% in Blantyre City, 70.6% in the Central-West zone, and 70.7% in the South-East zone.

9.2 Background

Viral load suppression is a key indicator of treatment success in HIV-positive individuals. For the purposes of MPHIA, VLS is defined as VL less than 1,000 HIV RNA copies per ml of plasma. This chapter describes VLS among the population of HIV-positive persons ages 15-64 years by age, sex, region, and other demographic characteristics.

9.3 Adult Viral Load Suppression by Select Demographic Characteristics

Overall, 68.3% of HIV-positive persons ages 15-64 years had HIV VLS (60.9% among males and 73.1% among females). The proportion with VLS was highest among those who reported previous diagnosis and ART use (91.3%) and lowest among those who reported previously diagnosis but no ART use (15.9%). About one-quarter (27.7%) of HIV-positive persons who reported that they were not previously diagnosed had VLS (Table 9.3.A).

Less than one-half (47.7%) of never-married HIV-positive persons had VLS, while 67.3% of married or cohabiting persons, 71.3% of divorced or separated persons, and 81.3% of widowed persons had VLS. (Table 9.3.A).

Table 9.3.A Viral load suppression by demographic characteristics

Among HIV-positive persons ages 15-64 years, percentage with viral load suppression (< 1,000 copies/ml)[1], by sex, self-reported HIV diagnosis and antiretroviral therapy (ART) status, and selected demographic characteristics, MPHIA 2015-2016

Characteristic	Males		Females		Total	
	Percentage VLS	Number	Percentage VLS	Number	Percentage VLS	Number
Self-reported HIV diagnosis and treatment status						
Not previously diagnosed	22.0	229	32.4	351	27.7	580
Previously diagnosed, not on ART	12.0	61	19.6	111	15.9	172
Previously diagnosed, on ART	89.7	419	92.1	1,040	91.3	1,459
Missing	*	3	*	6	*	9
Residence						
Urban	53.6	325	68.6	734	62.8	1,059
Rural	63.6	387	74.7	774	70.4	1,161
Zone						
North	62.6	67	71.2	114	67.7	181
Central-East	(60.3)	45	72.7	84	67.9	129
Central-West	66.3	56	74.3	82	70.6	138
Lilongwe City	53.7	119	71.9	279	64.9	398
South-East	59.8	104	77.1	231	70.7	335
South-West	63.5	150	73.5	346	69.8	496
Blantyre City	54.3	171	63.1	372	59.5	543
Marital status						
Never married	42.2	54	51.4	100	47.7	154
Married or living together	62.2	567	72.1	854	67.3	1,421
Divorced or separated	59.9	62	74.3	309	71.3	371
Widowed	(69.5)	29	82.8	243	81.3	272
Education						
No education	(53.5)	44	73.6	197	69.5	241
Primary	60.1	429	74.6	886	68.8	1,315
Secondary	63.1	202	67.1	370	65.3	572
More than secondary	(74.1)	37	72.4	53	73.3	90
Wealth quintile						
Lowest	51.7	82	72.2	170	64.2	252
Second	55.9	81	76.1	178	68.3	259
Middle	62.6	102	74.5	207	70.0	309
Fourth	68.2	155	74.9	271	72.1	426
Highest	62.2	292	69.6	682	66.9	974
Religion						
Catholic	58.9	128	77.5	246	70.2	374
CCAP[2]	57.6	136	71.8	267	65.7	403
Anglican	*	14	(84.5)	29	(81.1)	43
Seventh Day Adventist	(49.6)	48	75.9	132	66.3	180
Baptist	*	22	(61.7)	44	55.3	66
Other Christian	64.7	225	73.1	511	70.0	736
Muslim	66.6	51	70.0	153	69.1	204
Other	65.4	71	68.3	115	66.9	186
None	*	16	*	10	(60.2)	26
Ethnicity						
Chewa	65.3	163	73.5	305	69.9	468
Lomwe	62.1	232	76.7	455	70.6	687
Ngoni	52.7	96	69.5	212	63.1	308
Nkhonde	*	10	*	14	*	24
Sena	(60.1)	25	66.4	76	64.4	101
Tonga	*	12	*	23	(56.9)	35
Tumbuka	63.3	51	77.8	115	72.6	166
Yao	59.8	77	70.3	201	67.0	278
Other	(51.9)	46	77.5	104	68.3	150
Total 15-24	(37.2)	43	49.7	171	46.0	214
Total 15-49	58.1	556	71.7	1,324	66.6	1,880
Total 15-64	60.9	712	73.1	1,508	68.3	2,220

[1]Relates to Global AIDS Monitoring indicator 1.4: People living with HIV who have suppressed viral loads

[2]Church of Central Africa Presbyterian.

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

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

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

9.4 Adult Viral Load Suppression by Age and Sex

Among HIV-positive persons ages 15-64 years, the prevalence of VLS ranged from 39.3% among those ages 15-19 years to 78.8% among those ages 60-64 years. Viral load suppression prevalence was less than 50% among males younger than the age of 30 years, while among males ages 30-64 years, VLS prevalence ranged from 51.6% among males ages 30-34 years to 77.6% among males ages 50-54 years. Among HIV-positive females, prevalence of VLS was less than 50% among those ages 15-19 years, but higher than 70% among females age 30 years and older (Tables 9.4.A and 9.4.B; Figure 9.4.A).

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

Among HIV-positive persons age 0-64 years, percentage with viral load suppression (< 1,000 copies/ml)[1], by sex and age, MPHIA 2015-2016

Age	Males		Females		Total	
	Percentage VLS[2]	Number	Percentage VLS[2]	Number	Percentage VLS[2]	Number
0-4	*	11	*	7	*	18
5-9	*	14	*	23	(51.8)	37
10-14	*	21	*	20	(49.2)	41
15-19	*	15	(35.6)	38	39.3	53
20-24	(31.8)	28	56.2	133	49.2	161
25-29	(41.2)	49	64.7	217	58.9	266
30-34	51.6	110	75.1	292	65.9	402
35-39	61.1	121	75.1	295	69.8	416
40-44	64.6	127	80.2	216	73.8	343
45-49	72.7	106	82.1	133	77.3	239
50-54	77.6	70	78.3	91	78.0	161
55-59	71.2	51	82.7	58	77.5	109
60-64	(67.4)	35	(86.3)	35	78.8	70
Total 15-24	(37.2)	43	49.7	171	46.0	214
Total 15-49	58.1	556	71.7	1,324	66.6	1,880
Total 15-64	60.9	712	73.1	1,508	68.3	2,220

[1]Relates to Global AIDS Monitoring indicator 1.4: People living with HIV who have suppressed viral loads
[2]VLS: viral load suppression
Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.
An asterisk indicates that an estimate is based on a very small number (less than 25) of unweighted cases and has been suppressed.

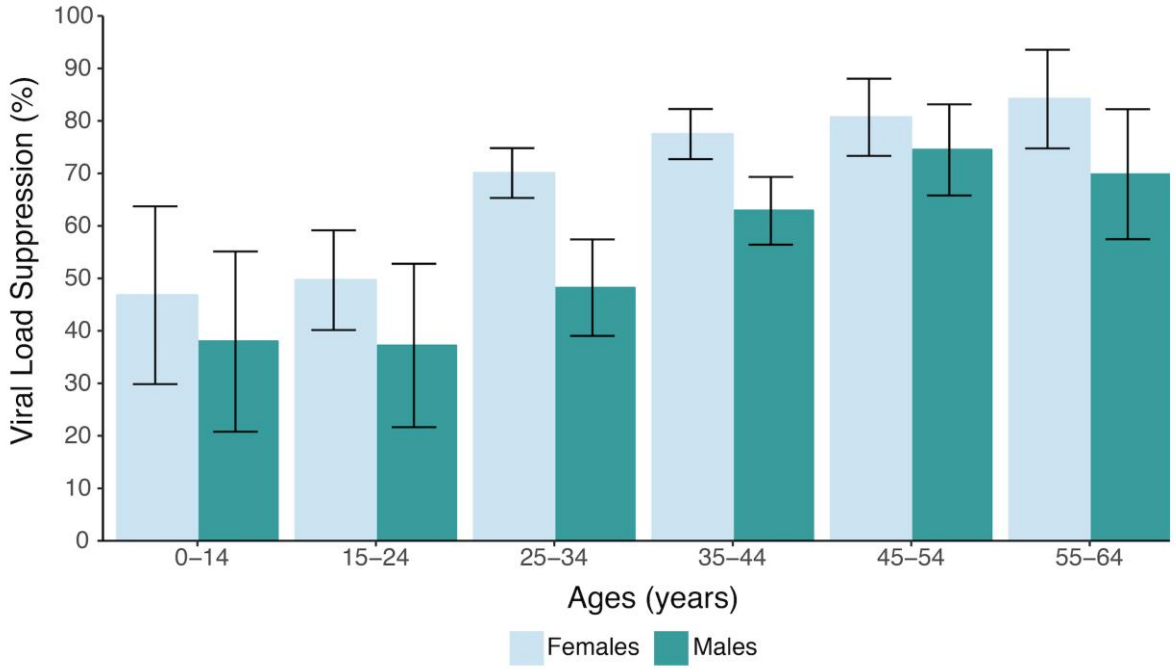
Table 9.4.B Viral load suppression by age (10-15-year age groups)

Among HIV-positive persons age 0-64 years, percentage with viral load suppression[1] (< 1,000 copies/ml), by sex and age, MPHIA 2015-2016

Age	Males		Females		Total	
	Percentage VLS[2]	Number	Percentage VLS[2]	Number	Percentage VLS[2]	Number
0-14	(38.0)	46	46.8	50	42.3	96
15-24	(37.2)	43	49.7	171	46.0	214
25-34	48.2	159	70.1	509	62.9	668
35-44	62.9	248	77.5	511	71.7	759
45-54	74.5	176	80.7	224	77.5	400
55-64	69.8	86	84.2	93	78.0	179

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

Figure 9.4.A Proportion of viral load suppression (<1000 copies/ml) among people living with HIV, by age and sex, MPHIA 2015-2016



9.5 Adult Viral Load Suppression by Zone

The percentage of HIV-positive adults ages 15-64 years with VLS ranged from 59.5% in Blantyre City, 70.6% in the Central-West zone, and 70.7% in the South-East zone. Among females, the prevalence of VLS was higher than 70.0% in all zones (71.2% in North zone to 77.1% in South-East zone), except in Blantyre City (63.1%). Among males, percentages of VLS were similarly low in Lilongwe City (53.7%) and Blantyre City (54.3%), (Table 9.3.A, Figures 9.5.A and 9.5.B).

Figure 9.5.A Viral load suppression (<1000 copies/ml) among HIV-positive adults ages 15-64 years, by zone, MPHIA 2015-2016

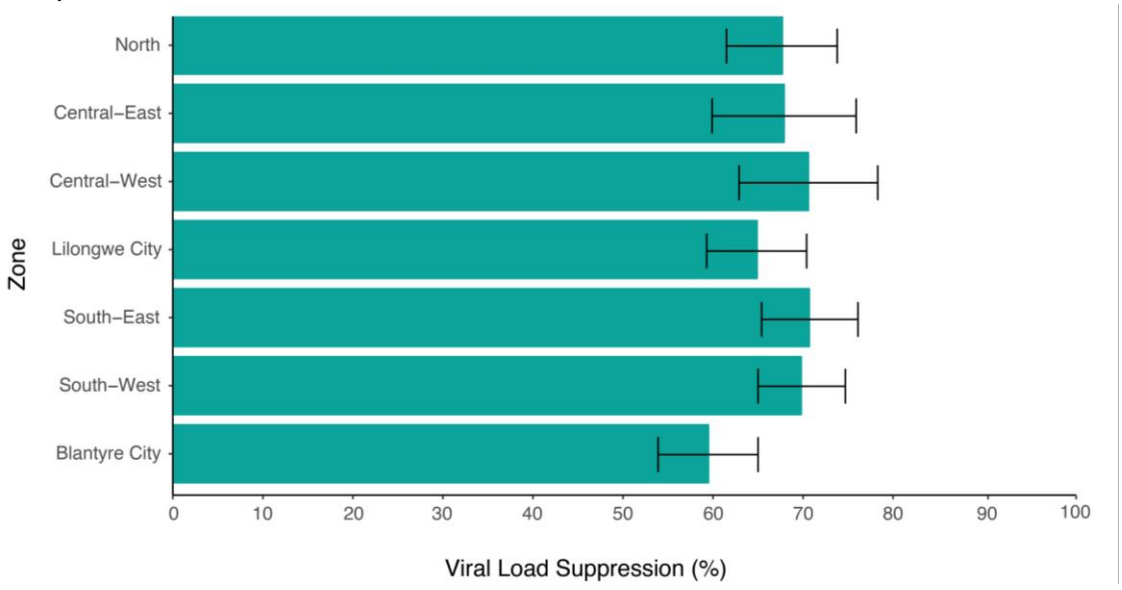
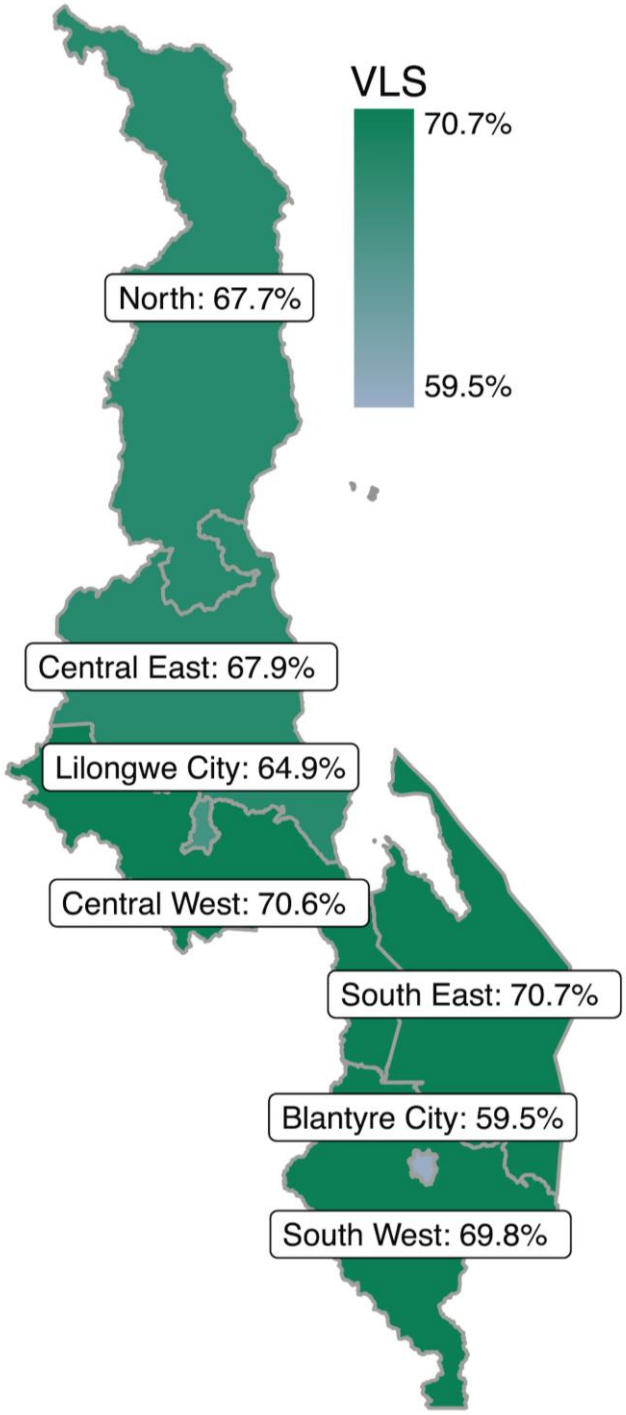


Figure 9.5.B Viral load suppression (<1000 copies/ml) among HIV-positive adults ages 15-64 years, by zone, MPHIA 2015-2016



9.6 Gaps and Unmet Needs

- Close to a third of the HIV-positive adults in the country are not virally suppressed. There is need to prioritize HIV testing to increase diagnosis, and once diagnosed, to initiate ART and ensure adherence in order to achieve a high level of VLS in the HIV-positive population.

10 UNAIDS 90-90-90 TARGETS

10.1 Key Findings

- **Diagnosed:** Based on self-report and ARV detection data, it is estimated that in Malawi, 76.8% of PLHIV ages 15-64 years know their HIV status (80.2% of HIV-positive females and 71.7% of HIV-positive males).
- **On treatment:** Based on self-report and ARV detection data, it is estimated that among PLHIV ages 15-64 years who know their HIV status, 91.4% were receiving ART (92.9**%** of females and 88.7% males).
- **Virally suppressed:** Among PLHIV ages 15-64 years who self-reported ARV use or had detectable ARVs in their blood, 91.3% were virally suppressed (92.1% females and 89.8% of males).

10.2 Background

In order to bring the HIV epidemic under control, UNAIDS has set the ambitious target referred to as 90-90-90: by 2020, 90% of all PLHIV will know their HIV status; 90% of all persons with diagnosed HIV infection will receive sustained ART; and 90% of all persons receiving ART will have VLS.[1]

The previous chapters on HIV testing and treatment provide results on coverage of HIV testing and treatment services. The chapter on VLS presents VLS among all HIV-positive, irrespective of knowledge of status or treatment use. This chapter presents the status of the 90-90-90 indicators, which reflect each critical stage of program performance. Awareness of HIV-positive status and treatment status among those aware of their HIV-positive status are indicators of access to services. Viral load suppression among those aware of their HIV status and on treatment not only provides an indication of access to and retention in care, VLS among all HIV-positive individuals of 73% (90 x 90 x 90) or greater is an indication of successful testing and treatment services progress to epidemic control.

The 90-90-90 results in this chapter have been presented in two ways. First, Table 10.3.A uses only self-reported awareness and ARV status. Individuals are defined as 'aware' of their HIV-positive status if they self-reported an HIV-positive status before testing as part of the MPHIA survey. Individuals were defined as 'on treatment' if they self-reported ART use. Second, Table 10.3.B measures the 90-90-90 indicators using both self-reported and ARV biomarker data. In this table, 'aware' and 'on treatment' have been adjusted such that individuals in whom ARVs were detected are classified as 'aware' and 'on treatment' even if they did not self-report. Individuals are classified as 'aware' of their HIV-positive status if they self-reported HIV-positive status and/or had detectable ARVs in their blood. Individuals are classified as 'on treatment' if they self-reported that they are taking ART and/or had detectable ARVs in their blood.

It is important to note that in both cascades, individuals who are not aware of their HIV-positive status or are not on ARVs, are excluded from the third 90 (VLS among those who are aware and on ARVs).

10.3 Status of the UNAIDS 90-90-90 Targets

90-90-90 cascade based on self-reported awareness of HIV Status and ARV use:

Based on self-reported awareness of HIV status and ARV use, Malawi has nearly achieved the second and third of the UNAIDS 90-90-90 targets: 89.7% of HIV-positive adults ages 15-64 years who know their status reported ART use, and 91.3% of those on ART had VLS. However, achievement in diagnosis is below the first target, with 72.8% of HIV-positive persons ages 15-64 years having reported awareness of their HIV-positive status (Table 10.3.A).

90-90-90 cascade based on self-reported awareness of HIV Status and ARV use and/or detectable ARVs:

ARV-adjusted awareness of HIV-positive status: Among adults ages 15-64 years living with HIV, 76.8% (71.7% of males and 80.2% of females) were classified as aware, according to combined self-reported awareness and/or detectable ARV data (ARV-adjusted awareness). Similar levels of ARV-adjusted awareness were observed for all age groups over the age of 25 years. However, ARV-adjusted awareness of HIV-positive status was observed in only 53.7% of PLHIV ages 15-24 years (44.6% of males and 57.6% of females)(Table 10.3.B; Figure 10.3.A).

ARV-adjusted treatment status: Based on either self-report ARV status or detectable ARVs, 91.4% of those with ARV-adjusted awareness status were classified as using ART. This was similar across age groups ranging from 85.7% among those ages 15-24 years to 92.8% among those ages 35-49 years. The greatest disparity by gender was seen in those ages 25-34 years, among whom 78.4% of males and 91.6% of females were on ART (ARV-adjusted treatment status) (Table 10.3.B; Figure 10.3.A).

Viral suppression: Among persons on ART (ARV-adjusted treatment status), 91.3% had VLS, ranging from 81.2% among those ages 15-24 years to 93.5% among those ages 25-34 years. Across all age bands, VLS among those on ART was similar among men and women (Table 10.3.B; Figure 10.3.A).

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

90-90-90 targets among people living with HIV ages 15-64 years, by sex and age, MPHIA 2015-2016

	Diagnosed					
	Males		Females		Total	
Age	Percentage who self-reported HIV positive	Number	Percentage who self-reported HIV positive	Number	Percentage who self-reported HIV positive	Number
15-24	(37.1)	44	55.3	169	49.8	213
25-34	58.9	159	72.2	510	67.9	669
35-49	73.8	353	82.7	640	78.9	993
15-49	66.0	556	75.4	1,319	71.8	1,875
15-64	68.0	711	75.9	1,503	72.8	2,214

	On Treatment, among those Diagnosed					
	Males		Females		Total	
Age	Percentage who self-reported on ART	Number	Percentage who self-reported on ART	Number	Percentage who self-reported on ART	Number
15-24	*	16	84.8	97	82.5	113
25-34	73.4	85	89.9	372	85.2	457
35-49	89.4	257	93.3	535	91.7	792
15-49	84.2	358	91.3	1,004	88.8	1,362
15-64	86.3	481	91.6	1,151	89.7	1,632

	Virally Suppressed, among those On Treatment					
	Males		Females		Total	
Age	Percentage virally suppressed	Number	Percentage virally suppressed	Number	Percentage virally suppressed	Number
15-24	*	13	79.6	83	78.8	96
25-34	91.7	60	94.1	330	93.5	390
35-49	89.5	228	91.6	492	90.8	720
15-49	89.4	301	91.5	905	90.8	1,206
15-64	89.7	419	92.1	1,040	91.3	1,459

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

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

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

90-90-90 targets among people living with HIV age 15-64 years, by sex and age, MPHIA 2015-2016

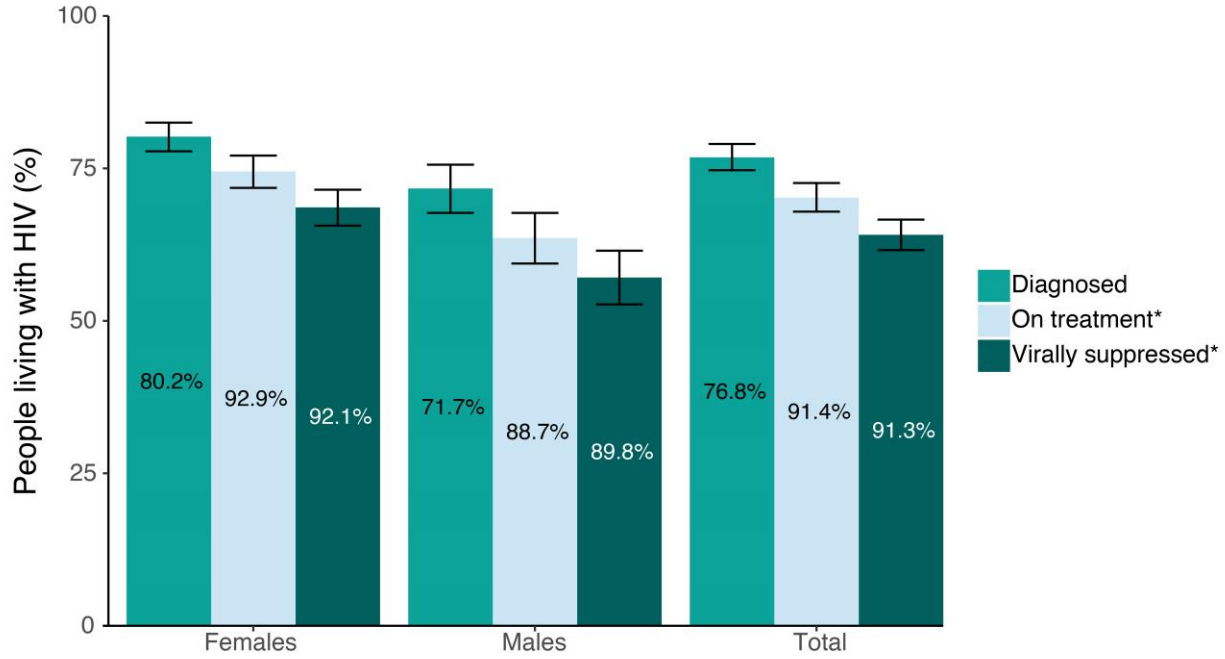
	Diagnosed[1]					
	Males		Females		Total	
Age	Percentage who self-reported HIV positive AND/OR with detectable ARVs	Number	Percentage who self-reported HIV positive AND/OR with detectable ARVs	Number	Percentage who self-reported HIV positive AND/OR with detectable ARVs	Number
15-24	(44.6)	44	57.6	170	53.7	214
25-34	60.8	159	76.9	509	71.6	668
35-49	77.2	354	87.8	642	83.3	996
15-49	69.3	557	79.9	1,321	75.9	1,878
15-64	71.7	712	80.2	1,505	76.8	2,217

	On Treatment[2], among those Diagnosed					
	Males		Females		Total	
Age	Percentage with detectable ARVs AND/OR who self-reported being on ART	Number	Percentage with detectable ARVs AND/OR who self-reported being on ART	Number	Percentage with detectable ARVs AND/OR who self-reported being on ART	Number
15-24	*	20	87.9	101	85.7	121
25-34	78.4	89	91.6	394	88.0	483
35-49	91.0	271	93.9	562	92.8	833
15-49	86.9	380	92.6	1,057	90.6	1,437
15-64	88.7	510	92.9	1,210	91.4	1,720

	Virally Suppressed[3], among those On Treatment					
	Males		Females		Total	
Age	Percentage virally suppressed	Number	Percentage virally suppressed	Number	Percentage virally suppressed	Number
15-24	*	17	81.4	89	81.2	106
25-34	92.5	66	93.8	358	93.5	424
35-49	89.1	245	91.8	521	90.7	766
15-49	89.5	328	91.6	968	90.9	1,296
15-64	89.8	454	92.1	1,110	91.3	1,564

[1]Relates to Global AIDS Monitoring indicator 1.1: People living with HIV who know their HIV status and PEPFAR Indicator DIAGNOSED_NAT.
[2]Relates to Global AIDS Monitoring indicator 1.2: People living with HIV on antiretroviral therapy and PEPFAR TX_CURR_NAT / SUBNAT.
[3]Relates to Global AIDS Monitoring indicator 1.4: People living with HIV who have suppressed viral loads and PEPFAR VL_SUPPRESSION_NAT.
Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.
An asterisk indicates that an estimate is based on a very small number (less than 25) of unweighted cases and has been suppressed.

Figure 10.3.A Adult 90-90-90 (adjusted for laboratory antiretroviral data[a] among adults ages 15-64 years), MPHIA 2015-2016



[a] In the antiretroviral (ARV)-adjusted 90-90-90 participants were classified as 'aware' or 'diagnosed' if they self-reported an HIV positive status before testing HIV positive in MPHIA and/or had detectable ARVs in their blood. Participants were classified as 'on treatment' if they self-reported that they were on treatment and/or if they had detectable ARVs in their blood.
*Inset numbers are conditional proportions.

10.4 Gaps and Unmet Needs

- The major gap is in diagnosis of PLHIV, especially among males and young adults.
- A gap persists in the initiation of ART, especially among males ages 25-34 years, among whom 22% of those already diagnosed were not receiving ART based on ARV-adjusted measures.
- Although VLS is high among those on ARVs, overall VLS among all PLHIV is 60.9% in males. This is even lower in the group ages 15-24 years (37.2% in males and 49.7% in females).

10.5 References

1. UNAIDS (2014). *90-90-90. An ambitious treatment target to help end the AIDS epidemic*. Retrieved from UNAIDS: http://www.unaids.org/sites/default/files/media_asset/90-90-90_en_0.pdf

11 Clinical Perspectives on People Living with HIV

11.1 Key Findings

- Among adults ages 15-64 years living with HIV who had not been diagnosed, 16.8% of males and 17.7% of females had severe immunosuppression with CD4 count less than 200 cells/µl.
- Among adults ages 15-64 years living with HIV, 98% of those who reported initiating ART less than 12 months prior to the survey, and 98% of those who reported initiating ART more than 12 months prior to the survey, reported that they were still taking ART at the time of the survey.
- Among 22 samples from recently-infected HIV-positive persons identified in MPHIA, 9.1% (2) had mutations associated with resistance to ARVs. None of the samples had mutations associated with resistance to all three classes of ARVs (nucleoside and non-nucleoside reverse transcriptase inhibitors (NNRTI)and protease inhibitors (PI)).

11.2 Background

The quality of HIV care is based on key principles of accessibility, efficiency, and safety. As countries implement treatment for all PLHIV, ensuring a sustainable health system that is people-centered and innovative requires diligent monitoring and responsiveness.[1] Indicators such as CD4 count at diagnosis and retention on ART can provide evidence of program coverage, the ability to reach vulnerable populations, and quality of care. The distribution of CD4 counts also reflects population health, and the potential impact of HIV on mortality. Finally, the measurement of transmitted drug resistance allows optimization of national ART guidelines including second- and third-line therapies. The MPHIA provided a unique opportunity to gauge progress in the expansion of HIV clinical services in Malawi, as well as identify gaps and future challenges.

11.3 CD4 Counts and Immunosuppression

Among HIV-positive adults ages 15-64 years, 58.4% were immunosuppressed with a CD4 count of less than 500 cells/µl. Nearly three-quarters of HIV-positive men were immunosuppressed (71.0%) compared to half of women (50.4%). The median CD4 count was 445 cells/µl in HIV-positive individuals ages 15-64 years (379 cells/µl in males and 497 cells/µl in females) (Table 11.3.A).

Among HIV-positive individuals ages 15-64 years who self-reported as previously diagnosed with HIV and on ART, 52.2% had a CD4 count of less than 500 cells/µl (66.9% of males and 44.2% of females). The overall median CD4 count was 486 cells/µl (400 cells/µl among males and 533 cells/µl among females). For those HIV-positive individuals not previously diagnosed, the median CD4 count was 380 cells/µl (344 cells/µl among males and 407 cells/µl among females)(Table 11.3.A; Figure 11.3.A).

Among HIV-positive individuals ages 15-64 years who self-reported as previously diagnosed with HIV, but not on ART, 78.7% had a CD4 count of less than 500 cells/µl (88.6% of males and 69.5% of females). The overall median CD4 count was 326 cells/µl (283 cells/µl in males and 386 cells/µl in females) (Table 11.3.A; Figure 11.3.A).

The percentage of individuals with CD4 count less than 500 cells/µl did not vary by residence, zone, marital status, education, religion, or age. Among the total adult population, the median CD4 count was observed to be less than 500 cells/µl across all zones, marital status, education, religion, and age categories, except among those ages 15-19 years. Among adult women however the median CD4 count was over 500 cells/µl in a number of these categories (Table 11.3.A).

Table 11.3.A Median CD4 count and prevalence of immunosuppression

Among HIV-positive persons ages 15-64 years, median (Q1, Q3) CD4 count and percentage with immunosuppression (< 500 cells/µl), by sex, self-reported diagnosis and antiretroviral therapy (ART) status, and selected demographic characteristics, MPHIA 2015-2016

Characteristic	Males			Females			Total		
	Median (Q1, Q3)	Percentage < 500 cells/µL	Number	Median (Q1, Q3)	Percentage < 500 cells/µL	Number	Median (Q1, Q3)	Percentage < 500 cells/µL	Number
Self-reported diagnosis and treatment status									
Not previously diagnosed	344 (233, 524)	73.0	219	407 (251, 602)	64.2	338	380 (245, 562)	68.3	557
Previously diagnosed, not on ART	283 (187, 426)	88.6	62	386 (186, 534)	69.5	111	326 (187, 482)	78.7	173
Previously diagnosed, on ART	400 (269, 550)	66.9	419	533 (381, 696)	44.2	1,038	486 (336, 649)	52.2	1,457
Missing	*	*	4	*	*	9	*	*	13
Residence									
Urban	355 (222, 515)	73.0	323	480 (305, 665)	52.4	732	424 (266, 613)	60.4	1,055
Rural	382 (251, 535)	70.3	381	503 (352, 674)	49.6	764	449 (307, 623)	57.7	1,145
Zone									
North	308 (176, 465)	78.2	67	439 (270, 602)	60.5	112	380 (207, 536)	67.8	179
Central-East	352 (298, 423)	(83.1)	40	419 (273, 626)	56.1	78	392 (288, 552)	66.5	118
Central-West	392 (233, 536)	67.2	55	536 (344, 682)	41.6	81	475 (302, 647)	53.3	136
Lilongwe City	358 (224, 580)	67.0	117	512 (338, 661)	48.6	280	450 (280, 633)	55.7	397
South-East	398 (249, 544)	70.2	104	501 (356, 673)	49.9	230	458 (304, 621)	57.4	334
South-West	399 (267, 544)	68.3	150	506 (368, 690)	48.5	346	468 (333, 644)	55.7	496
Blantyre City	361 (248, 519)	72.5	171	469 (312, 635)	54.1	369	418 (278, 590)	61.7	540
Marital status									
Never married	419 (260, 624)	55.7	55	445 (283, 671)	53.3	100	423 (275, 662)	54.3	155
Married or living together	381 (260, 531)	71.0	558	502 (359, 677)	49.8	845	442 (297, 608)	60.0	1,403
Divorced or separated	293 (189, 482)	77.2	62	468 (317, 660)	53.3	307	434 (289, 618)	58.3	369
Widowed	235 (119, 397)	(86.2)	29	512 (339, 660)	47.1	242	476 (323, 639)	51.6	271
Education									
No education	431 (300, 609)	(60.8)	44	466 (317, 633)	54.8	195	461 (316, 631)	56.1	239
Primary	377 (234, 522)	72.5	425	508 (359, 685)	48.3	876	451 (298, 627)	58.0	1,301
Secondary	373 (262, 545)	70.5	199	475 (312, 674)	53.6	370	420 (285, 595)	61.1	569
More than secondary	366 (220, 515)	(68.0)	36	447 (307, 605)	52.7	53	385 (278, 600)	60.9	89
Wealth quintile									
Lowest	387 (270, 535)	73.2	80	485 (311, 653)	51.1	169	432 (296, 604)	59.6	249
Second	403 (247, 542)	66.1	81	498 (342, 674)	50.1	176	447 (306, 635)	56.3	257
Middle	369 (229, 523)	72.1	99	502 (382, 728)	49.2	203	457 (305, 660)	57.9	302
Fourth	386 (268, 568)	67.8	155	495 (340, 640)	51.5	270	449 (311, 607)	58.4	425
Highest	336 (203, 498)	74.9	289	499 (331, 660)	50.0	678	432 (275, 609)	59.2	967

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

Characteristic	Males			Females			Total		
	Median (Q1, Q3)	Percentage < 500 cells/µL	Number	Median (Q1, Q3)	Percentage < 500 cells/µL	Number	Median (Q1, Q3)	Percentage < 500 cells/µL	Number
Religion									
Catholic	410 (280, 587)	59.9	125	523 (366, 693)	45.7	245	486 (328, 661)	51.1	370
CCAP[1]	378 (273, 531)	70.2	133	482 (335, 646)	52.7	264	423 (294, 604)	60.2	397
Anglican	*	*	14	473 (382, 585)	(52.8)	28	478 (404, 602)	(55.6)	42
Seventh Day Adventist	337 (220, 437)	(82.1)	49	498 (328, 679)	49.8	130	426 (293, 591)	61.9	179
Baptist	*	*	21	440 (322, 598)	(58.1)	44	385 (220, 563)	65.9	65
Other Christian	372 (246, 522)	72.5	223	507 (340, 688)	48.9	507	452 (299, 631)	57.7	730
Muslim	303 (194, 455)	86.2	51	465 (300, 625)	55.7	152	423 (262, 555)	64.0	203
Other	393 (248, 587)	67.1	71	499 (323, 709)	48.9	115	411 (297, 651)	57.7	186
None	*	*	16	*	*	10	356 (204, 522)	(64.3)	26
Ethnicity									
Chewa	387 (249, 531)	70.5	160	519 (352, 676)	46.7	302	446 (297, 615)	57.1	462
Lomwe	391 (262, 543)	68.3	230	516 (366, 690)	47.5	454	462 (316, 635)	56.2	684
Ngoni	330 (230, 430)	81.0	94	505 (347, 635)	48.5	208	421 (285, 599)	60.8	302
Nkhonde	*	*	10	*	*	14	*	*	24
Sena	438 (293, 544)	(65.1)	25	468 (333, 709)	56.4	76	467 (333, 643)	59.2	101
Tonga	*	*	12	*	*	23	367 (173, 516)	(72.1)	35
Tumbuka	305 (169, 418)	81.2	51	403 (254, 643)	62.4	112	364 (208, 527)	69.3	163
Yao	398 (223, 504)	73.5	77	474 (328, 635)	53.2	200	445 (293, 601)	59.6	277
Other	400 (279, 578)	(59.8)	45	540 (375, 737)	43.7	104	504 (327, 677)	49.5	149
Age									
15-19	*	*	14	516 (313, 738)	(45.8)	38	514 (298, 736)	47.1	52
20-24	405 (284, 545)	(62.3)	27	506 (341, 736)	49.8	131	474 (315, 701)	53.4	158
25-29	364 (250, 496)	(74.8)	48	483 (340, 661)	56.0	215	456 (283, 633)	60.6	263
30-34	341 (214, 500)	74.7	107	511 (337, 698)	47.8	291	437 (284, 615)	58.2	398
35-39	409 (265, 587)	64.6	121	486 (331, 637)	51.8	294	465 (298, 612)	56.7	415
40-44	337 (220, 527)	71.7	126	503 (365, 601)	48.5	213	444 (299, 576)	58.1	339
45-49	394 (279, 526)	68.1	106	507 (330, 673)	48.1	134	418 (314, 620)	58.2	240
50-54	326 (232, 449)	78.3	69	432 (300, 640)	57.9	90	400 (257, 570)	68.1	159
55-59	361 (224, 511)	74.5	51	514 (370, 599)	44.1	57	421 (295, 578)	58.0	108
60-64	371 (225, 457)	(85.9)	35	540 (378, 724)	(44.5)	33	424 (348, 644)	61.4	68
Total 15-24	420 (281, 607)	(58.5)	41	520 (340, 739)	48.5	169	496 (312, 714)	51.4	210
Total 15-49	381 (248, 536)	69.4	549	498 (337, 673)	50.4	1,316	450 (298, 625)	57.5	1,865
Total 15-64	379 (240, 531)	71.0	704	497 (339, 673)	50.4	1,496	445 (297, 621)	58.4	2,200

[1]Church of Central Africa Presbyterian.

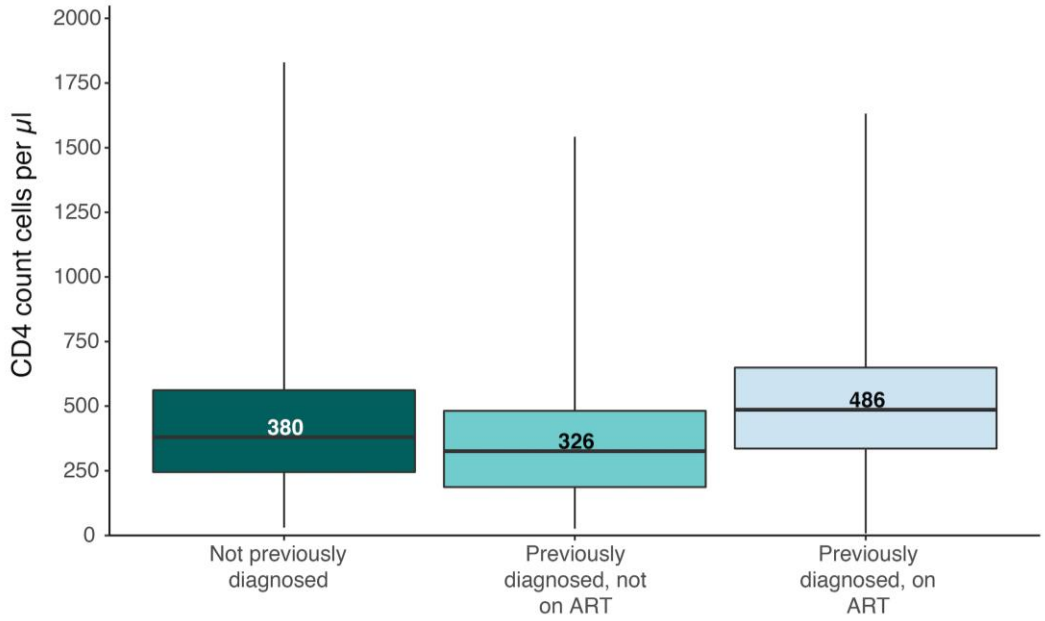
Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.

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

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

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

Figure 11.3.A CD4 count distribution among HIV-positive adults ages 15-64 years, by antiretroviral therapy status, MPHIA 2015-2016



11.4 Late HIV Diagnosis

Among HIV-positive adults ages 15-64 years who were unaware of their status (that is, they self-reported HIV-negative or never tested), close to half (47.3%) had a CD4 count less than 350 cells/µl (51.0% of males and 43.9% of females), and 17.2% had a CD4 count less than 200 cells/µl (16.8% of males and 17.7% of females).

In these HIV-positive adults ages 15-64 years who were unaware of their status, the prevalence of severe immunosuppression with CD4 counts less than 200 cells/µl peaked among those residing in urban areas (24.0%), those in the highest wealth quintile (25.4%), and those ages 15-19 years (29.8%).

Table 11.4.A Late HIV diagnosis

Among persons ages 15-64 years who tested HIV positive in the PHIA survey but self-reported HIV negative and with no detectable antiretrovirals, percentage who had a CD4 cell count < 200 cells/µl and < 350 cells/µl, by sex and selected demographic characteristics, MPHIA 2015-2016

Characteristic	Males			Females			Total		
	Percentage < 200 cells/µl[1]	Percentage < 350 cells/µl[1]	Number	Percentage < 200 cells/µl[1]	Percentage < 350 cells/µl[1]	Number	Percentage < 200 cells/µl[1]	Percentage < 350 cells/µl[1]	Number
Residence									
Urban	25.5	54.3	99	22.6	43.2	152	24.0	48.7	251
Rural	12.4	49.4	92	15.5	44.2	129	14.0	46.6	221
Zone									
North	*	*	15	*	*	22	(39.8)	(68.7)	37
Central-East	*	*	11	*	*	14	(10.5)	(50.0)	25
Central-West	*	*	16	*	*	14	(5.7)	(45.2)	30
Lilongwe City	(27.5)	(63.6)	38	18.0	35.8	56	22.7	49.4	94
South-East	(16.8)	(41.0)	25	(9.2)	(45.7)	39	12.7	43.5	64
South-West	(10.8)	(44.6)	35	20.9	36.9	54	16.3	40.4	89
Blantyre City	20.5	56.6	51	21.4	43.9	82	21.0	50.1	133
Marital status									
Never married	*	*	22	(21.4)	(49.6)	37	20.6	43.1	59
Married or living together	14.6	51.5	146	16.8	45.0	156	15.6	48.7	302
Divorced or separated	*	*	20	17.7	37.2	54	20.7	45.0	74
Widowed	*	*	3	(17.1)	(44.0)	34	(19.6)	(47.0)	37
Education									
No education	*	*	15	(10.2)	(54.7)	27	(6.1)	(42.0)	42
Primary	15.8	52.1	122	19.6	44.2	149	17.6	48.3	271
Secondary	(27.3)	(61.4)	48	17.9	39.8	94	21.7	48.5	142
More than secondary	*	*	6	*	*	10	*	*	16
Wealth quintile									
Lowest	(9.8)	(40.1)	31	(13.6)	(57.7)	25	11.4	47.3	56
Second	*	*	22	(9.8)	(44.2)	26	(13.7)	(50.5)	48
Middle	(16.5)	(46.5)	26	(12.8)	(35.9)	35	14.4	40.7	61
Fourth	(6.7)	(40.0)	32	21.9	38.7	51	14.5	39.3	83
Highest	29.5	67.4	80	22.6	44.9	144	25.4	54.0	224
Religion									
Catholic	(7.2)	(53.3)	31	(14.9)	(45.3)	49	11.0	49.3	80
CCAP[2]	(22.6)	(49.7)	37	13.8	45.9	55	18.3	47.9	92
Anglican	*	*	3	*	*	3	*	*	6
Seventh Day Adventist	*	*	20	(10.7)	(35.6)	27	(10.9)	(42.0)	47
Baptist	*	*	7	*	*	6	*	*	13
Other Christian	18.6	51.6	61	20.6	47.1	86	19.7	49.2	147
Muslim	*	*	10	(24.8)	(46.3)	30	(23.7)	(51.5)	40
Other	*	*	16	*	*	24	(14.3)	(35.3)	40
None	*	*	5	*	*	1	*	*	6
Ethnicity									
Chewa	(10.8)	(40.0)	47	9.9	38.9	56	10.3	39.5	103
Lomwe	13.8	49.8	51	11.4	42.4	86	12.5	45.8	137
Ngoni	(15.2)	(61.2)	30	(14.1)	(30.4)	43	14.7	46.8	73
Nkhonde	*	*	5	*	*	5	*	*	10
Sena	*	*	12	*	*	14	(15.1)	(38.4)	26
Tonga	*	*	3	*	*	7	*	*	10
Tumbuka	*	*	11	*	*	20	(44.8)	(72.1)	31
Yao	*	*	22	(26.5)	(50.0)	37	22.2	50.7	59
Other	*	*	10	*	*	12	*	*	22
Age									
15-19	*	*	5	*	*	22	(29.8)	(42.8)	27
20-24	*	*	16	(2.4)	(39.8)	45	6.4	34.5	61
25-29	*	*	23	13.7	37.3	53	17.1	43.3	76
30-34	(14.7)	(53.6)	42	12.1	46.3	58	13.5	50.1	100
35-39	(7.9)	(41.7)	34	(41.0)	(59.8)	40	22.0	49.4	74
40-44	(27.4)	(66.4)	28	*	*	23	29.1	59.6	51
45-49	*	*	19	*	*	14	(11.7)	(45.6)	33
50-54	*	*	10	*	*	15	(17.0)	(52.6)	25
55-59	*	*	10	*	*	6	*	*	16
60-64	*	*	4	*	*	5	*	*	9
Total 15-24	*	*	21	11.8	37.4	67	14.5	37.4	88
Total 15-49	17.0	49.2	167	18.2	44.5	255	17.6	46.8	422
Total 15-64	16.8	51.0	191	17.7	43.9	281	17.2	47.3	472

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

[2]Church of Central Africa Presbyterian.

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

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

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

11.5 Retention on Antiretroviral Therapy

Among PLHIV ages 15-64 years who initiated ART less than 12 months prior to the survey, 98.0% (100% of men and 96.9% of women) reported that they were still taking ART at the time of the survey (Table 11.5.A). Nearly all (99.0%) PLHIV with detectable ARVs reported they were still on ART. There was little variation by sociodemographic characteristics aside from marital status. Among people who were divorced or separated, 91.5% reported they were still on ART compared to 100% of persons who were married (Table 11.5.A).

Among PLHIV ages 15-64 years who initiated ART 12 months or more prior to the survey, 98.0% reported that they were still taking ART at the time of the survey. This was nearly identical between men and women (98.0% and 98.1% respectively). There was little variation by geographic or sociodemographic characteristics. Nearly all (99.8%) PLHIV with detectable ARVs reported they were still on ART compared to 84.7% of people with no detectable ARVs (Table 11.5.B).

Table 11.5.A Retention on antiretroviral therapy (ART): people initiating antiretroviral therapy less than 12 months prior to the survey

Among HIV-positive persons age 15-64 years who self-reported initiating ART less than 12 months prior to the survey, percentage who self-reported still receiving ART, by sex and selected demographic characteristics, MPHIA 2015-2016

Characteristic	Males		Females		Total	
	Percentage still receiving ART[1]	Number	Percentage still receiving ART[1]	Number	Percentage still receiving ART[1]	Number
Presence of detectable ARVs[2]						
Detectable	100.0	56	98.4	148	99.0	204
Not detectable	*	3	*	14	*	17
Residence						
Urban	*	22	100	83	100.0	105
Rural	(100.0)	37	95.7	80	97.3	117
Zone						
North	*	10	*	10	*	20
Central-East	*	3	*	8	*	11
Central-West	*	4	*	10	*	14
Lilongwe City	*	6	(100.0)	36	(100.0)	42
South-East	*	8	*	24	(100.0)	32
South-West	*	17	(94.3)	36	96.3	53
Blantyre City	*	11	(100.0)	39	100.0	50
Marital status						
Never married	*	2	*	10	*	12
Married or living together	(100.0)	42	100.0	91	100.0	133
Divorced or separated	*	11	(88.6)	40	91.5	51
Widowed	*	4	*	22	(100.0)	26
Education						
No education	*	3	*	24	(96.4)	27
Primary	(100.0)	39	96.3	94	97.7	133
Secondary	*	14	(100.0)	41	100.0	55
More than secondary	*	3	*	4	*	7
Wealth quintile						
Lowest	*	10	*	21	(100.0)	31
Second	*	1	*	24	(94.0)	25
Middle	*	6	(93.0)	29	(94.4)	35
Fourth	*	22	*	21	(100.0)	43
Highest	*	20	100.0	68	100.0	88
Religion						
Catholic	*	10	*	23	(100.0)	33
CCAP[3]	*	10	(100.0)	28	(100.0)	38
Anglican	*	1	*	4	*	5
Seventh Day Adventist	*	2	*	13	*	15
Baptist	*	3	*	7	*	10
Other Christian	*	19	(97.6)	49	98.5	68
Muslim	*	9	*	22	(96.8)	31
Other	*	5	*	15	*	20
None	*	0	*	2	*	2
Ethnicity						
Chewa	*	10	(92.9)	33	(95.5)	43
Lomwe	*	22	(96.9)	41	98.1	63
Ngoni	*	7	*	22	(100.0)	29
Nkhonde	*	1	*	0	*	1
Sena	*	1	*	10	*	11
Tonga	*	1	*	1	*	2
Tumbuka	*	7	*	12	*	19
Yao	*	9	(95.8)	28	(97.1)	37
Other	*	1	*	16	*	17
Age						
15-19	*	0	*	1	*	1
20-24	*	1	*	14	*	15
25-29	*	5	(96.2)	33	(96.9)	38
30-34	*	15	(96.1)	40	97.9	55
35-39	*	14	(100.0)	26	(100.0)	40
40-44	*	14	*	19*	(100.0)	33
45-49	*	2	*	17	*	19
50-54	*	5	*	5	*	10
55-59	*	2	*	5	*	7
60-64	*	1	*	3	*	4
Total 15-24	*	1	*	15	*	16
Total 15-49	100.0	51	98.2	150	98.8	201
Total 15-64	100.0	59	96.9	163	98.0	222

[1]Relates to Global AIDS Monitoring indicator 1.3: Retention on antiretroviral therapy at 12 months; [2]Antiretroviral (ARV) detection assay included only atazanavir, efavirenz, and lopinavir. Participants who reported antiretroviral therapy use and/or had undetectable viral load but had no evidence of the first three ARVs were tested for nevirapine as well.

[3]Church of Central Africa Presbyterian.

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

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

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

Table 11.5.B Retention on antiretroviral therapy (ART): people initiating antiretroviral therapy more than 12 months prior to the survey

Among HIV-positive persons age 15-64 years who self-reported initiating ART 12 months or more prior to the survey, percentage who self-reported still receiving ART, by sex and selected demographic characteristics, MPHIA 2015-2016

Characteristic	Males		Females		Total	
	Percentage still receiving ART[1]	Number	Percentage still receiving ART[1]	Number	Percentage still receiving ART[1]	Number
Presence of detectable ARVs[2]						
Detectable	99.6	312	100.0	771	99.8	1,083
Not detectable	(88.1)	49	82.4	98	84.7	147
Residence						
Urban	97.7	155	98.6	403	98.3	558
Rural	98.1	206	97.9	474	98.0	680
Zone						
North	(100.0)	39	100.0	67	100.0	106
Central-East	*	24	(95.5)	45	97.2	69
Central-West	(100.0)	26	(97.5)	45	98.6	71
Lilongwe City	96.9	58	97.3	153	97.2	211
South-East	95.4	57	97.8	148	97.0	205
South-West	99.0	75	98.6	220	98.7	295
Blantyre City	96.9	82	98.1	199	97.6	281
Marital status						
Never married	*	21	(98.0)	40	97.4	61
Married or living together	98.0	300	97.1	504	97.5	804
Divorced or separated	*	24	99.1	171	99.0	195
Widowed	*	16	99.8	160	99.8	176
Education						
No education	*	23	99.1	121	98.9	144
Primary	98.8	212	97.7	528	98.0	740
Secondary	95.8	106	98.2	192	97.1	298
More than secondary	*	20	(100.0)	35	100.0	55
Wealth quintile						
Lowest	(94.81)	25	97.3	104	96.8	129
Second	(97.3)	47	98.0	106	97.7	153
Middle	100.0	51	98.2	118	98.9	169
Fourth	97.4	83	100.0	168	99.0	251
Highest	98.7	155	97.0	381	97.6	536
Religion						
Catholic	100.0	65	99.1	150	99.4	215
CCAP[3]	98.8	65	98.9	153	98.9	218
Anglican	*	8	*	17	(100)	25
Seventh Day Adventist	(96.3)	25	96.8	76	96.6	101
Baptist	*	9	*	24	(100.0)	33
Other Christian	97.5	118	98.2	306	98.0	424
Muslim	(93.7)	26	94.7	82	94.5	108
Other	(99.1)	38	98.6	63	98.9	101
None	*	7	*	5	*	12
Ethnicity						
Chewa	97.6	77	98.2	175	98.0	252
Lomwe	98.0	117	98.8	280	98.5	397
Ngoni	(99.1)	49	97.4	117	98.0	166
Nkhonde	*	4	*	9	*	13
Sena	*	11	(97.0)	43	97.9	54
Tonga	*	7	*	14	*	21
Tumbuka	(100.0)	30	98.7	66	99.2	96
Yao	(94.1)	38	96.0	108	95.5	146
Other	(100.0)	28	100.0	63	100	91

Table 11.5.B Retention on antiretroviral therapy (ART): people initiating antiretroviral therapy MORE THAN 12 months prior to the survey (continued)

Characteristic	Males		Females		Total	
	Percentage still receiving ART[1]	Number	Percentage still receiving ART[1]	Number	Percentage still receiving ART[1]	Number
Age						
20-24	*	5	97.0	54	97.5	59
25-29	*	8	93.9	101	94.7	109
30-34	(98.6)	32	97.8	161	98.0	193
35-39	96.0	56	98.3	192	97.6	248
40-44	98.9	73	98.7	149	98.8	222
45-49	100.0	72	100.0	85	100.0	157
50-54	(98.0)	47	99.3	61	98.7	108
55-59	(100.0)	33	(100.0)	40	100.0	73
60-64	(87.1)	29	*	23	94.3	52
Total 15-24	*	11	97.7	65	98.2	76
Total 15-49	98.6	252	97.7	753	98.0	1,005
Total 15-64	98.0	361	98.1	877	98.0	1,238

[1]Relates to Global AIDS Monitoring indicator 1.3: Retention on antiretroviral therapy at 12 months; [2]Antiretroviral detection assay included only atazanavir, efavirenz, and lopinavir. Participants who reported antiretroviral therapy use and/or had undetectable viral load but had no evidence of the first three ARVs were tested for nevirapine as well.

[3]Church of Central Africa Presbyterian.

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

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

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

11.6 Viral Load Suppression and Severe Immunosuppression According to Duration of Antiretroviral Therapy

Among HIV-positive adults ages 15-64 years, those who reported ART use had high levels of VLS irrespective of the reported duration of therapy, with similar percentages of VLS among those who reported ART use for 24 months or longer (91.8%), among those on ART between 12-23 months (89.4%), and among those on ART for less than 12 months (90.0%). In contrast, the prevalence of severe immunosuppression (CD4 count less than 200 cells/µl) differed considerably between those who reported ART use for more than 24 months (6.5%), those who reported ART use between 12-23 months (18.2%), and less than 12 months (17.2%) (Table 11.6.A).

Among those who reported ART use for more than 24 months, those ages 15-24 years had a lower prevalence of VLS (71.2%) and higher prevalence of severe immunosuppression (7.3%) than those ages 25-65 years, among whom 92.9% had VLS and 6.5% were severely immunosuppressed. Males had a higher prevalence of severe immunosuppression than females (9.1% compared to 5.2%, respectively) (Table 11.6.A).

Among those who reported ART use between 12-23 months, a lower percentage of males (82.4%) than females (93.6%) had VLS and a higher percentage of males (33.4%) than females (9.1%) were severely immunosuppressed (Table 11.6.A).

Among those who reported ART use for less than 12 months, although similar percentages of males (88.8%) and females 90.7%) had VLS, a considerably larger fraction of males (27.8%) than females (11.4%) had severe immunosuppression (Table 11.6.A).

Table 11.6.A Viral load suppression and severe immunosuppression

Among HIV-positive persons ages 15-64 years, percentage with viral load suppression (< 1,000 copies/ml) and percentage with severe Immunosuppression (CD4 count < 200 cells/µl) by antiretroviral therapy (ART) status, by selected demographic characteristics, MPHIA 2015-2016

Characteristic	On ART ≥ 24 months		On ART 12-23 months		On ART < 12 months		Not on ART		Total
	With viral load suppression	Number	With viral load suppression	Number	With viral load suppression	Number	With viral load suppression	Number	
Sex									
Male	92.0	294	82.4	53	88.8	59	19.7	290	696
Female	91.7	722	93.6	129	90.7	159	29.7	462	1,472
Residence									
Urban	89.9	463	86.2	80	89.7	105	21.5	394	1,042
Rural	92.5	553	90.3	102	90.1	113	26.7	358	1,126
Age									
15-24	71.2	53	*	20	*	16	21.9	116	205
25-64	92.9	963	90.4	162	89.58	202	25.7	636	1,963
Total 15-64	91.8	1,016	89.4	182	90.0	218	25.1	752	2,168

Characteristic	On ART ≥ 24 months		On ART 12-23 months		On ART < 12 months		Not on ART		Total
	With severe immuno-suppression	Number	With severe immuno-suppression	Number	With severe immuno-suppression	Number	With severe immuno-suppression	Number	
Sex									
Male	9.1	295	33.4	53	27.8	59	19.8	281	688
Female	5.2	721	9.1	129	11.4	161	18.3	449	1,460
Residence									
Urban	6.7	462	21.7	80	18.2	105	24.4	391	1,038
Rural	6.5	554	17.3	102	16.9	115	16.6	339	1,110
Age									
15-24	7.3	53	*	20	*	16	12.3	112	201
25-64	6.5	963	19.9	162	17.2	204	20.3	618	1,947
Total 15-64	6.5	1,016	18.2	182	17.2	220	19.0	730	2,148

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

11.7 Transmitted Resistance to Antiretroviral Therapy

As indicated in section 1.3 an objective of MPHIA was to estimate the prevalence of transmitted resistance to ARVs, using samples from HIV-positive participants who were identified as recent HIV infections using the Recent Infection Testing Algorithm (Figure 2.5.A).

Among 22 successfully amplified samples from recently infected, HIV-positive adults identified in MPHIA, two had evidence of resistance to ARVs. One had mutations associated with resistance to non-nucleoside reverse transcriptase inhibitors (NNRTI) and one had mutations associated with resistance to protease inhibitors. None had resistance to more than one class of ARVs (Table 11.7.A). Among the subset of samples that underwent genotyping, 100% were Subtype C (Table 11.7.B).

Table 11.7.A Resistance to antiretrovirals

Among persons ages 15-64 years who were recently infected with HIV, percentage with resistance to antiretrovirals (ARVs), by class of ARV, MPHIA 2015-2016

	Percent	Number	DR Mutations Detected[1]
Successfully amplified[2]	*	22	
Any	*	2	K103S, M46I
NRTI	*	0	
NNRTI	*	1	K103S
PI	*	1	M46I
NRTI & NNRTI	*	0	
NRTI, NNRTI & PI	*	0	

[1]Based on *Stanford Database for HIV Drug Resistance Mutation. https://hivdb.stanford.edu/assets/media/resistance-mutation-handout-Dec2017.b8f72e32.pdf*

[2]Unweighted figures, from a total of 22 cases.

NRTI: Nucleoside Reverse Transcriptase Inhibitors

NNRTI: Non-Nucleoside Reverse Transcriptase Inhibitors

PI: Protease inhibitor

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

* Commonly used ARVs by class include: Non-nucleoside reverse transcriptase inhibitors nevirapine (NVP) and efavirenz (EFV); Nucleoside reverse transcriptase inhibitors tenofovir (TDF), lamivudine (3TC), zidovudine (AZT), emtricitabine (FTC) and PIs lopinavir/ritonavir (LPV/r) and atazanavir (ATV).

Table 11.7.B HIV subtype

Percent distribution of HIV-positive persons age 15-64 years that underwent genotyping, by HIV Subtype, MPHIA 2015-2016

Subtype	Total	
	Percent	Number
Subtype A	0	0
Subtype B	0	0
Subtype C	100	107
Subtype D	0	0
Subtype G	0	0
Recombinant	0	0
Total	100.0	107

Unweighted figures

11.8 Gaps and Unmet Needs

- Late diagnosis, or CD4 counts less than 350 cells/µL, among undiagnosed PLHIV is common, particularly among older PLHIV. There is a need to reach this high-risk population of undiagnosed PLHIV over the age of 30 years.

11.9 References

1. World Health Organization (2016). *Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection*. Retrieved from WHO: http://www.who.int/hiv/pub/arv/arv-2016/en/

12 Prevention of Mother-to-Child Transmission

12.1 Key Findings

- Among women ages 15-49 years, who gave birth during the three years preceding the survey, 99.4% attended at least one antenatal care (ANC) visit for their most recent pregnancy during the three years prior to the survey.
- Among women ages 15-49 years who gave birth during the 12 months preceding the survey, 97.2% knew their HIV status.
- Among HIV-positive women ages 15-49 years who gave birth during the 12 months preceding the survey, 97.9% received ARVs.
- Among infants under the age of one year born to HIV-positive women ages 15-49 years, 1.2% were HIV-positive, according to virological testing conducted by MPHIA.

12.2 Background

Pregnant women living with HIV are at high risk of transmitting HIV to their infants during pregnancy, during birth, or through breastfeeding. Over 90% of new infections among infants and young children occur through MTCT. Without any interventions, between 20% and 45% of infants may become infected, with an estimated risk of 5-10% during pregnancy, 10-20% during labor and delivery, and 5-20% through breastfeeding.[1] In 2010, global targets were set to decrease new HIV infections in children and reduce mortality among mothers living with HIV, including a 90% reduction in child HIV infections, a 50% reduction in AIDS-related maternal deaths, and virtual elimination of MTCT.[2]

To prevent MTCT, the United Nations recommends a comprehensive four-pronged approach including: (1) primary prevention of HIV infection among women of childbearing age; (2) preventing unintended pregnancies among women living with HIV; (3) preventing HIV transmission from women living with HIV to their infants; and (4) providing appropriate treatment, care, and support to mothers living with HIV, their children, and families.[2]

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

12.3 Antenatal Care Attendance

Among women ages 15-49 years who gave birth during the three years preceding the survey, the percentage who attended at least one ANC visit for their most recent birth was 99.4%, with very little variation across demographic characteristics (Table 12.3.A).

Table 12.3.A Antenatal care

Among women ages 15-49 years who delivered in the three years preceding the survey, percentage who attended at least one ANC visit for her most recent birth, by selected demographic characteristics, MPHIA 2015-2016

Characteristic	Percentage who attended at least one antenatal care visit	Number
Residence		
Urban	99.3	1,185
Rural	99.5	2,412
Zone		
North	99.8	451
Central-East	99.5	510
Central-West	99.4	461
Lilongwe City	99.4	565
South-East	99.6	528
South-West	99.3	601
Blantyre City	98.3	481
Marital status		
Never married	99.3	178
Married or living together	99.6	2,990
Divorced or separated	98.4	388
Widowed	(97.4)	40
Education		
No education	98.1	291
Primary	99.5	2,338
Secondary	99.8	872
More than secondary	100.0	95
Wealth quintile		
Lowest	99.0	618
Second	99.3	617
Middle	99.7	597
Fourth	99.8	694
Highest	99.3	1,071
Religion		
Catholic	99.9	553
CCAP[1]	100.0	581
Anglican	100.0	83
Seventh Day Adventist	100.0	257
Baptist	100.0	92
Other Christian	99.1	1,332
Muslim	99.1	413
Other	98.8	263
None	*	20
Ethnicity		
Chewa	99.6	1,200
Lomwe	99.3	729
Ngoni	99.6	427
Nkhonde	(100.0)	39
Sena	99.1	160
Tonga	100.0	68
Tumbuka	99.7	355
Yao	99.2	432
Other	98.8	179

Table 12.3.A Antenatal care (continued)		
Characteristic	Percentage who attended at least one antenatal care visit	Number
Age		
15-19	99.6	323
20-24	99.7	1,217
25-29	99.5	839
30-34	99.8	685
35-39	98.2	364
40-44	98.4	125
45-49	(98.2)	44
Total 15-24	99.6	1,540
Total 15-49	99.4	3,597

[1]Church of Central Africa Presbyterian.
The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.
Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.
An asterisk indicates that an estimate is based on a very small number (less than 25) of unweighted cases and has been suppressed.

12.4 Breastfeeding

Among women ages 15-49 years who gave birth within the three years preceding the survey, over 90% were currently breastfeeding their last-born children younger than the age of 18 months. Current breastfeeding decreased to 69.5% among last-born children ages 18-23 months and to 16.3% among last-born children ages 24-36 months. For children last-born to women ages 15-49 years in the three years preceding the survey, current breastfeeding was reported by 56.7% of those whose mothers tested HIV positive during the survey, and for 67.9% of those whose mothers tested HIV negative (Table 12.4.A).

Table 12.4.A Breastfeeding status by child's age and mother's HIV status

Percent distribution of last-born children born to women ages 15-49 years in the three years preceding the survey by breastfeeding status, by child's age and mother's HIV status, MPHIA 2015-2016

Characteristic	Never breast fed	Ever breast fed, but not currently breast feeding	Currently breast feeding	Total	Number
Child's age (months)					
0-1	0.8	0.0	98.2	100.0	207
2-3	0.3	0.0	98.5	100.0	206
4-5	1.1	1.3	96.3	100.0	253
6-8	1.0	0.9	96.6	100.0	325
9-11	1.2	2.0	95.3	100.0	302
12-17	0.7	6.1	90.9	100.0	606
18-23	1.4	28.7	69.5	100.0	582
24-36	1.1	80.8	16.3	100.0	1,105
Result of mother's PHIA survey HIV test					
HIV positive	1.6	37.0	56.7	100.0	369
HIV negative	1.0	30.1	67.9	100.0	2,778
Not tested	0.8	27.1	70.0	100.0	451
Total	1.0	30.3	67.1	100.0	3,598

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

12.5 Awareness of Mother's HIV Status

Among women ages 15-49 years who gave birth during the 12 months preceding the survey, 97.2% reported that they knew their HIV status. Over 90% of these women reported testing for HIV and receiving their result during ANC for this pregnancy (2.3% reported testing positive and 89.7% reported testing negative), while 5.3% of them reported that they already knew they were HIV positive. In urban areas, 7.3% already knew their HIV-positive status, compared to 4.9% in rural areas. A higher percentage of women older than the age of 30 years already knew that they were HIV positive (8.3% among those ages 35-39 years and 10.9% among those ages 40-44-years), compared to women in younger age groups (2.1% among ages 15-19 years and 5.7% among ages 25-29 years). Among women ages 15-49 years who gave birth during the 12 months preceding the survey, 4.3% in Blantyre City and 4.2% in Lilongwe reported learning about their HIV-positive status as a result of ANC testing in comparison to lower percentages in the other five zones (from 0.0% in Central-West to 3.6% in South-East) (Table 12.5.A).

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

Among women ages 15-49 years who gave birth within the past 12 months, percentage who were tested for HIV during ANC and received their results or who already knew they were HIV positive, by selected demographic characteristics, MPHIA 2015-2016

Characteristic	Tested for HIV and received result[1]		Percentage who already knew they were HIV positive	Total percentage with known HIV status[2]	Number of women who delivered within the past 12 months
	Percentage who tested HIV positive	Percentage who tested HIV negative			
Residence					
Urban	2.7	88.7	7.3	98.7	431
Rural	2.2	89.8	4.9	96.9	853
Zone					
North	2.3	94.6	1.7	98.7	167
Central-East	1.4	93.5	0.7	95.6	186
Central-West	0.0	93.7	3.4	97.2	166
Lilongwe City	4.2	89.0	4.4	97.6	206
South-East	3.6	84.6	8.3	96.6	186
South-West	3.3	85.2	9.6	98.1	203
Blantyre City	4.3	82.7	11.3	98.3	170
Marital status					
Never married	0.3	91.8	3.1	95.2	72
Married or living together	2.2	90.3	4.7	97.2	1,077
Divorced or separated	4.5	83.2	10.4	98.1	122
Widowed	*	*	*	*	12
Education					
No education	4.8	85.5	7.8	98.1	99
Primary	1.9	90.0	5.4	97.2	829
Secondary	2.5	90.6	3.9	97.1	324
More than secondary	(5.6)	(85.8)	(2.2)	(93.6)	32
Wealth quintile					
Lowest	3.0	88.2	5.5	96.8	228
Second	1.1	90.2	3.3	94.6	225
Middle	2.6	89.8	6.0	98.4	212
Fourth	2.2	89.1	7.7	99.0	227
Highest	2.6	91.2	4.2	98.0	392
Religion					
Catholic	2.4	86.9	6.5	95.8	211
CCAP[2]	1.9	92.9	3.2	98.0	206
Anglican	(0.0)	(82.7)	(12.5)	(95.2)	28
Seventh Day Adventist	1.7	91.9	4.8	98.4	99
Baptist	(3.5)	(76.2)	(8.7)	(88.4)	40
Other Christian	2.4	90.4	5.0	97.8	465
Muslim	2.7	89.0	6.0	97.7	146
Other	2.2	92.9	2.8	97.9	84
None	*	*	*	*	4
Ethnicity					
Chewa	1.2	94.1	1.8	97.1	447
Lomwe	5.1	85.7	8.2	99.1	242
Ngoni	0.9	83.5	8.6	93.1	154
Nkhonde	*	*	*	*	10
Sena	2.7	83.4	12.2	98.3	60
Tonga	*	*	*	*	24
Tumbuka	0.0	95.4	2.8	98.1	135
Yao	4.3	84.3	9.4	98.1	147
Other	3.1	88.9	4.0	96.0	62
Age					
15-19	0.0	94.8	2.1	96.9	162
20-24	1.5	92.9	3.2	97.6	457
25-29	4.1	86.5	5.7	96.2	290
30-34	4.5	83.0	10.2	97.8	211
35-39	2.5	87.0	8.3	97.8	117
40-44	(0.0)	(85.5)	(10.9)	(96.4)	36
45-49	*	*	*	*	11
Total 15-24	1.0	93.6	2.8	97.4	619
Total 15-49	2.3	89.7	5.3	97.2	1,284

[1]Relates to PEPFAR PMTCT_STAT_NAT / SUBNAT. [2]Church of Central Africa Presbyterian.An asterisk indicates that an estimate is based on a very small number (less than 25) of unweighted cases and has been suppressed.

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

12.6 Antiretroviral Therapy Among HIV-Positive Pregnant Women

Among self-reported HIV-positive women ages 15-49 years who gave birth within the 12 months preceding the survey, 97.9% reported receiving ARVs during pregnancy: 40.3% were newly initiated on ARVs during pregnancy or labor and delivery, while 57.7% were already taking ARVs at the time of their first ANC visit for the pregnancy (Table 12.6.A).

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

Among HIV-positive women ages 15-49 years who gave birth within the past 12 months, percentage who received antiretrovirals during pregnancy to reduce the risk of mother-to-child-transmission, by selected demographic characteristics, MPHIA 2015-2016

Characteristic	Percentage who were already on ARVs prior to pregnancy	Percentage who were newly initiated on ARVs during pregnancy or labor and delivery	Total percentage who received ARVs[1]	Number of HIV-positive women who gave birth within the past 12 months
Residence				
Urban	59.0	36.0	95.1	51
Rural	57.3	41.4	98.7	62
Zone				
North	*	*	*	7
Central-East	*	*	*	3
Central-West	*	*	*	7
Lilongwe City	*	*	*	18
South-East	*	*	*	22
South-West	(64.0)	(36.0)	(100.0)	27
Blantyre City	(50.0)	(45.7)	(95.6)	29
Marital status				
Never married	*	*	*	3
Married or living together	57.6	41.4	99.0	89
Divorced or separated	*	*	*	19
Widowed	*	*	*	2
Education				
No education	*	*	*	14
Primary	59.0	38.5	97.4	72
Secondary	(53.1)	(45.0)	(98.1)	25
More than secondary	*	*	*	2
Wealth Quintile				
Lowest	*	*	*	21
Second	*	*	*	9
Middle	*	*	*	20
Fourth	(70.8)	(27.4)	(98.2)	27
Highest	(48.0)	(48.0)	(96.0)	36
Religion				
Catholic	*	*	*	18
CCAP[2]	*	*	*	17
Anglican	*	*	*	3
Seventh Day Adventist	*	*	*	7
Baptist	*	*	*	6
Other Christian	(58.3)	(40.6)	(98.9)	44
Muslim	*	*	*	11
Other	*	*	*	7
None	*	*	*	0

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

Among HIV-positive women ages 15-49 years who gave birth within the past 12 months, percentage who received antiretrovirals during pregnancy to reduce the risk of mother-to-child-transmission, by selected demographic characteristics, MPHIA 2015-2016

Characteristic	Percentage who were already on ARVs prior to pregnancy	Percentage who were newly initiated on ARVs during pregnancy or labor and delivery	Total percentage who received ARVs[1]	Number of HIV-positive women who gave birth within the past 12 months
Chewa	*	*	*	18
Lomwe	(55.4)	(38.7)	(94.1)	36
Ngoni	*	*	*	18
Nkhonde	*	*	*	1
Sena	*	*	*	11
Tonga	*	*	*	1
Tumbuka	*	*	*	5
Yao	*	*	*	18
Other	*	*	*	5
Age				
15-19	*	*	*	3
20-24	*	*	*	23
25-29	(49.0)	(47.5)	(96.5)	29
30-34	(56.8)	(40.9)	(97.7)	37
35-39	*	*	*	16
40-44	*	*	*	5
45-49	*	*	*	0
Total 15-24	(57.9)	(40.5)	(98.4)	26
Total 15-49	57.7	40.3	97.9	113

[1]Relates to Global AIDS Monitoring indicator 2.3: Preventing the mother-to- child transmission of HIV and PMTCT_ARV_NAT / SUBNAT. [2]Church of Central Africa Presbyterian.

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

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

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

12.7 Early Infant Diagnosis

Among infants born in the three years preceding the survey to women who self-reported an HIV-positive status during the corresponding pregnancy (diagnosed before or at any time during it), about half (49.4%) received an HIV test within two months of birth, while 29.3% received a test within 2-12 months of birth, according to mothers' reporting (Table 12.7.A).

Table 12.7.A Prevention of mother-to-child transmission, early infant testing

Among HIV-positive women ages 15-49 years who delivered within the past 36 months, percentage whose last-born infant had an HIV test done within two months of birth and within 12 months of birth, by result of HIV test, MPHIA 2015-2016

Characteristic	Percentage of infants who had an HIV test done within 2 months of birth[1]	Percentage of infants who had an HIV test done between 2 to 12 months of birth[2,3]	Number of last-born infants of HIV-positive women who delivered within the past 36 months
Result of infant's HIV test			
HIV positive	*	*	5
HIV negative	58.8	38.9	206
Don't know/other	(78.0)	(22.0)	32
Total	49.4	29.3	292

[1]Relates to Global AIDS Monitoring indicator 2.1: Early infant diagnosis and PEPFAR PMTCT_EID; [2]Relates to PEPFAR PMTCT_EID; [3]Includes only last-born infants

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

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

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

12.8 Mother-to-Child Transmission

Among infants born to HIV-positive women during the 17 and 11 months preceding the survey, 3.0% and 1.2%, respectively, were confirmed to be HIV-positive using virological testing. None of the infants whose mothers reported ARV use at the first ANC visit had confirmed HIV infection (Table 12.8.A).

Table 12.8.A Mother-to-child transmission of HIV

Among infants born in the last 17 months to HIV-positive women ages 15-49 years, percentage confirmed positive for HIV infection, by mother's self-reported ARV and breastfeeding status MPHIA 2015-2016

Characteristic	Percentage of infants confirmed HIV positive[1]	Number of infants born to HIV-positive women[2]
Mother's self-reported ARV status		
Mother unaware of HIV status during pregnancy	*	10
Already on ARVs at first antenatal visit	(0.0)	27
Newly initiated on ARVs during pregnancy or labor and delivery	*	22
Did not receive ARVs during pregnancy	*	0
Missing self-reported ARV status during pregnancy	*	4
Mother's self-reported breastfeeding status		
Ever breastfed the infant	2.5	60
Never breastfed the infant	*	0
Missing breastfeeding status	*	3
Total 0-11 months	(1.2)	34
Total 0-17 months	3.1	63

[1]Relates to GAM 2.2; [2]Includes only infants who were tested for HIV during the PHIA survey
Weighted figures calculated using btwt0.
The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

12.9 Gaps and Unmet Needs

- Among self-reported HIV-positive women ages 15-49 years, 40.0% reported newly initiating ART during pregnancy, labor, or delivery. Evidence shows that MTCT rates are lower if women are on ART before pregnancy.
- According to mothers' reporting, half of infants born to HIV-positive women did not receive a virological test for HIV infection in the first two months of life. It is essential to ensure early testing of HIV-exposed children.

12.10 References

1. De Cock, KM., et al., (2000). Prevention of mother-to-child HIV transmission in resource-poor countries: translating research into policy and practice. *Journal of the American Medical Association*, 283(9):1175-1182. doi:10.1001/jama.283.9.1175

2. WHO, UNICEF, UNFPA and UNAIDS (2011). *Towards the elimination of mother-to-child transmission of HIV: Report of a WHO technical consultation*. Retrieved from WHO: http://apps.who.int/iris/bitstream/handle/10665/44638/9789241501910_eng.pdf;jsessionid=CD35DAE3C3D00349A9B149BCFF9262C4?sequence=1

13 ADOLESCENTS AND YOUNG ADULTS

13.1 Key Findings

- Among those ages 15-24 years, 13.7% reported having sexual intercourse before the age of 15 years (19.0% among males and 8.8% among females).
- Among those ages 15-24 years, 47.0% correctly responded to all questions in a set that assessed knowledge of HIV transmission and prevention (50.1% of males and 44.0% of females).
- Incidence of HIV infection among those ages 15-24 years was estimated to be 0.23 (95% CI 0.03, 0.43).
- HIV prevalence in those ages 15-19 years was 1.5% (0.9% in males, 2.0% in females) and 3.8% in those ages 20-24 years (2.3% in males, 5.2% in females).
- Progress on UNAIDS 90-90-90 targets among those ages 15-24 years: Based on self-report and detection of ARVs in blood, it is estimated that 53.7% of PLHIV ages 15-24 years had been diagnosed with HIV (44.6% of males and 57.6% of females), and that among those who had been previously diagnosed, 85.7% were on ART. Among those on treatment, 81.2% had VLS.

13.2 Background

One-third of the population of sub-Saharan Africa is between ages 10-24 years, a phenomenon often referred to as the youth bulge.[1] Adolescents and young adults, ages 15-24 years, are more likely to engage in risky sexual behaviors than older adults and have less frequent contact with the healthcare system. Control of HIV in this demographic is critical for long-term epidemic control, but is also particularly challenging.

This chapter presents the prevalence of early sexual debut before age 15 years among men and women, by marital status, region, and socio-demographic characteristics. It describes knowledge of HIV prevention among men and women ages 15-24 years. These data were measured by asking participants to agree or disagree with both accurate and inaccurate statements about HIV prevention. This chapter also describes HIV incidence, prevalence, and the 90-90-90 cascade for those ages 15-24 years.

13.3 Sexual Intercourse Before the Age of 15 Years

Among those ages 15-24 years, twice the proportion of males (19.0%) compared to females (8.8%) reported having had sexual intercourse before the age of 15 years. Among males, 23.7% of those ages 15-19 years reported sexual intercourse before the age of 15 years, compared to 13.2% of those ages 20-24 years. Among those ages 15-24-years with more than secondary education, 5.2% reported sexual intercourse before the age of 15 years, compared to 23.1% of those with no education. The percentage of young people reporting sexual intercourse before the age of 15 years is elevated in the South-East (18.4%) and South-West (16.2%) zones (Table 13.3.A).

Table 13.3.A Sex before the age of 15 years

Percentage of males and females age 15–24 years who have had sexual intercourse before the age of 15; by sex and selected demographic characteristics, MPHIA 2015-2016

Characteristic	Males		Females		Total	
	Percentage who had sex before age 15	Number	Percentage who had sex before age 15	Number	Percentage who had sex before age 15	Number
Residence						
Urban	18.2	1,218	8.3	1,602	13.3	2,820
Rural	19.2	1,798	8.9	2,447	13.9	4,245
Zone						
North	15.5	430	7.9	522	11.9	952
Central-East	15.2	443	6.5	530	11.0	973
Central-West	17.0	303	7.7	437	12.1	740
Lilongwe City	15.8	553	6.5	730	11.2	1,283
South-East	27.9	325	10.8	510	18.4	835
South-West	21.8	449	11.2	635	16.2	1,084
Blantyre City	17.1	513	8.7	685	12.8	1,198
Marital status						
Never married	20.2	2,496	7.0	1,920	14.9	4,416
Married or living together	13.4	454	9.2	1,811	10.4	2,265
Divorced or separated	18.2	58	18.4	299	18.3	357
Widowed	*	1	*	13	*	14
Education						
No education	31.2	66	19.3	159	23.1	225
Primary	21.6	1,563	10.2	2,306	15.5	3,869
Secondary	14.9	1,263	4.2	1,435	10.1	2,698
More than secondary	7.5	123	2.2	149	5.2	272
Wealth quintile						
Lowest	18.6	300	13.3	505	15.6	805
Second	20.3	407	8.0	554	14.0	961
Middle	22.3	462	9.1	638	15.5	1,100
Fourth	18.4	629	8.8	804	13.6	1,433
Highest	16.4	1,218	6.0	1,548	11.3	2,766
Religion						
Catholic	17.2	617	8.4	803	12.7	1,420
CCAP[1]	13.4	626	6.8	773	10.1	1,399
Anglican	25.1	76	17.1	97	21.2	173
Seventh Day Adventist	15.0	225	6.9	337	10.7	562
Baptist	28.1	92	5.2	94	18.0	186
Other Christian	20.4	813	9.1	1,268	14.3	2,081
Muslim	26.5	326	10.2	392	17.9	718
Other	13.8	178	11.0	267	12.3	445
None	30.3	60	*	13	27.4	73
Ethnicity						
Chewa	17.7	1,044	7.9	1,371	12.7	2,415
Lomwe	19.3	544	10.7	795	14.7	1,339
Ngoni	14.6	332	5.7	467	10.0	799
Nkhonde	(15.4)	31	(7.9)	41	11.5	72
Sena	30.5	128	8.9	178	19.2	306
Tonga	16.9	70	14.6	91	15.8	161
Tumbuka	13.1	374	7.4	455	10.4	829
Yao	30.0	357	10.9	457	19.8	814
Other	15.2	126	7.9	181	11.3	307
Age						
15-19	23.7	1,655	9.2	1,843	16.3	3,498
20-24	13.2	1,361	8.3	2,206	10.7	3,567
Total 15-24	19.0	3,016	8.8	4,049	13.7	7,065

[1]Church of Central Africa Presbyterian.

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

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

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

13.4 Knowledge About HIV Prevention

The MPHIA also collected information on knowledge of HIV prevention, by asking two questions about prevention of sexual transmission of HIV and three questions related to common misconceptions about contracting HIV.

Only 50.1% of males ages 15-24 years answered all five HIV knowledge questions correctly with a higher proportion of young men in urban areas (59.5%) responding correctly to all five questions, compared to those in rural areas (47.4%). Among males in this age group, 87.2% responded correctly that the risk of HIV transmission can be reduced by having one partner and 80.8% responded correctly that HIV transmission risk can be reduced by consistent condom use. A higher proportion of males in the highest wealth quintile (62.2%) answered all questions correctly compared to those in the lowest wealth quintile (40.2%). Among young men with more than secondary education, 77.6% answered all questions correctly compared to 44.9% of those with no education and 41.0% of those with primary education (Table 13.4.A)

Only 44.0% of females ages 15-24 years answered all five HIV knowledge questions correctly. Among females in this age group, 84.4% responded correctly that the risk of HIV transmission can be reduced by having one partner and 72.3% correctly responded that HIV transmission risk can be reduced by consistent condom use. Among young women with more that secondary education, 79.2% answered all questions correctly compared to 28.5% of those with no education and 38.6% of those with primary education. Among females ages 15-24 years in Lilongwe City and Blantyre City, the percentage who answered all five questions correctly was 54.4% and 57.5%, respectively, compared to 35.2% in the North and 37.0% in Central West (Table 13.4.B).

Overall, among males and females ages 15-24 years, 47.0% answered all five HIV knowledge questions correctly. Among both males and females, 85.8% responded correctly that the risk of HIV transmission can be reduced by having one partner and 76.5% responded correctly that HIV transmission risk can be reduced by consistent condom use. Regarding misconceptions, 20% responded that a person can get HIV from a mosquito bite. Geographically, the highest proportion that responded to all five questions correctly was in Blantyre City (61.4%) and the lowest proportion of young adults who responded correctly was in the Central West (37.7%). The percentage of those answering all questions correctly varied in terms of wealth and education from 38.8% among those in the lowest wealth quintile to 57.4% among those in the highest wealth quintile, and from 34.2% among those with no education to 78.3% among those with more than secondary education. Correct knowledge was also more frequent among urban residents (55.5%) than among rural residents (44.7%). It also varied among age groups with 51.7% answering all questions correctly among those ages 20-24 years compared to 43.1% in those ages 15-19 years (Table 13.4.C)

Table 13.4.A Young people, knowledge about HIV prevention: Males

Among males ages 15-24 years, percentage who correctly identify both ways of preventing the sexual transmission of HIV and reject major misconceptions about HIV transmission, by selected demographic characteristics, MPHIA 2015-2016

Characteristic	Percentage who correctly answered the questions:						Number[2]
	Can the risk of HIV transmission be reduced by having sex with only one uninfected partner who has no other partners?	Can a person reduce the risk of getting HIV by using a condom every time they have sex?	Can a healthy-looking person have HIV?	Can a person get HIV from mosquito bites?	Can a person get HIV by sharing food with someone who is infected?	All five questions	
Residence							
Urban	90.0	82.9	91.3	84.1	93.9	59.5	634
Rural	86.5	80.2	83.8	77.7	92.4	47.4	907
Zone							
North	86.2	82.3	86.4	77.5	92.7	53.4	213
Central-East	86.7	76.4	82.8	81.3	93.0	52.2	214
Central-West	80.7	78.2	80.4	75.5	92.5	38.5	156
Lilongwe City	92.0	82.5	88.3	84.5	94.6	56.8	297
South-East	90.0	81.4	87.5	76.0	90.6	47.6	175
South-West	90.0	84.0	87.0	79.8	92.8	52.1	230
Blantyre City	90.4	84.4	92.4	88.4	97.1	65.6	256
Marital status							
Never married	86.5	80.8	84.2	80.3	92.4	50.4	1,283
Married or living together	90.2	80.7	93.1	74.2	94.7	49.6	227
Divorced or separated	(90.5)	(82.1)	(77.3)	(71.8)	(90.4)	(43.8)	26
Widowed	*	*	*	*	*	*	1
Education							
No education	(69.3)	(78.7)	(77.2)	(74.1)	(88.6)	(44.9)	35
Primary	84.6	78.9	81.6	73.3	91.5	41.0	793
Secondary	92.3	83.8	91.1	87.3	94.6	62.8	652
More than secondary	90.6	81.9	98.7	98.0	98.8	77.6	60
Wealth quintile							
Lowest	83.5	78.7	86.3	70.7	86.1	40.2	151
Second	84.8	79.8	83.5	72.1	94.2	42.0	195
Middle	84.7	76.2	79.0	77.8	90.4	43.1	228
Fourth	88.8	82.8	86.0	81.8	96.0	53.1	343
Highest	91.0	84.0	90.4	85.9	93.9	62.2	624
Religion							
Catholic	87.2	80.0	84.8	82.1	93.0	49.4	332
CCAP[3]	88.7	81.6	89.6	82.7	95.4	53.9	306
Anglican	(97.8)	(96.4)	(92.1)	(85.8)	(95.1)	(74.3)	39
Seventh Day Adventist	91.3	78.4	90.7	85.0	95.7	56.3	107
Baptist	(84.1)	(75.0)	(83.9)	(73.2)	(85.3)	(33.2)	46
Other Christian	87.6	81.0	85.3	74.5	94.6	48.5	416
Muslim	84.4	81.7	82.3	77.2	87.9	45.8	171
Other	83.5	80.6	77.6	79.0	90.6	46.3	87
None	(83.9)	(76.1)	(84.1)	(82.0)	(85.5)	(59.7)	36
Ethnicity							
Chewa	86.5	77.7	82.3	80.0	93.7	47.5	528
Lomwe	93.3	86.6	91.1	79.8	96.5	57.1	280
Ngoni	86.2	82.0	91.2	80.0	87.7	51.4	176
Nkhonde	*	*	*	*	*	*	18
Sena	90.0	71.3	86.4	73.4	87.9	40.9	65
Tonga	(82.4)	(84.0)	(91.3)	(82.9)	(97.4)	(54.6)	40
Tumbuka	84.9	82.5	84.0	77.2	93.2	52.9	182
Yao	84.9	80.7	83.5	76.1	90.3	44.3	187
Other	90.7	87.1	90.1	83.9	90.1	59.1	59
Age							
15-19	84.9	79.9	80.6	78.6	91.2	45.2	856
20-24	90.1	81.9	91.4	79.7	94.6	56.1	685
Total 15-24	87.2	80.8	85.5	79.1	92.8	50.1	1,541

[1]Relates to Global AIDS Monitoring indicator 5.1: Young people: Knowledge about HIV prevention. [2]Includes only participants who answered all five questions.
[3]Church of Central Africa Presbyterian.
Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.
An asterisk indicates that an estimate is based on a very small number (less than 25) of unweighted cases and has been suppressed.
The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

Table 13.4.B Young people, knowledge about HIV prevention: Females

Among females ages 15-24 years, percentage who correctly identify both ways of preventing the sexual transmission of HIV and reject major misconceptions about HIV transmission, by selected demographic characteristics, MPHIA 2015-2016

Characteristic	Percentage who correctly answered the questions						Number[2]
	Can the risk of HIV transmission be reduced by having sex with only one uninfected partner who has no other partners?	Can a person reduce the risk of getting HIV by using a condom every time they have sex?	Can a healthy-looking person have HIV?	Can a person get HIV from mosquito bites?	Can a person get HIV by sharing food with someone who is infected?	All five questions	
Residence							
Urban	91.3	77.5	87.5	84.1	94.1	51.3	819
Rural	82.7	71.0	80.8	80.1	92.2	42.2	1,239
Zone							
North	84.2	70.8	77.3	77.0	90.9	35.2	272
Central-East	81.1	69.0	79.2	79.7	93.7	43.5	271
Central-West	81.5	63.9	82.3	85.1	92.7	37.0	222
Lilongwe City	90.0	79.4	89.3	85.9	93.5	54.4	365
South-East	85.3	73.4	79.3	81.4	92.3	45.1	250
South-West	85.1	78.3	85.7	76.1	91.9	48.9	325
Blantyre City	91.4	81.4	89.8	87.1	95.5	57.5	353
Marital status							
Never married	83.4	70.9	79.5	83.1	93.1	45.0	987
Married or living together	86.1	73.3	85.7	78.1	91.5	42.5	906
Divorced or separated	81.8	75.5	79.4	82.5	94.7	45.7	155
Widowed	*	*	*	*	*	*	8
Education							
No education	68.8	64.9	82.7	68.7	86.9	28.5	75
Primary	81.7	70.6	77.2	78.8	91.8	38.6	1,167
Secondary	92.0	76.6	92.0	86.8	95.0	56.4	741
More than secondary	99.0	84.4	100.0	95.4	98.3	79.2	75
Wealth quintile							
Lowest	80.5	70.2	84.4	74.3	90.1	37.6	244
Second	84.0	70.2	78.0	80.1	90.1	41.6	280
Middle	84.4	73.6	81.8	82.2	93.3	43.6	330
Fourth	81.5	70.4	77.7	82.3	94.2	41.5	411
Highest	89.8	75.7	87.8	83.5	94.0	52.3	793
Religion							
Catholic	83.8	69.2	78.3	82.4	91.9	43.2	399
CCAP[3]	89.4	75.3	84.7	82.6	95.9	48.8	382
Anglican	86.0	80.3	76.6	88.7	91.8	54.1	53
Seventh Day Adventist	90.1	77.7	88.4	81.2	90.8	54.4	174
Baptist	85.0	71.4	83.2	78.2	96.4	34.8	50
Other Christian	82.5	69.5	83.5	79.0	92.3	40.6	660
Muslim	83.3	76.3	82.3	79.1	89.4	42.0	199
Other	76.6	71.8	73.1	83.5	94.3	42.9	134
None	*	*	*	*	*	*	5
Ethnicity							
Chewa	83.0	67.1	81.7	81.5	93.7	40.5	692
Lomwe	86.6	77.9	83.6	81.9	94.6	50.3	421
Ngoni	86.3	78.0	88.8	84.9	94.2	52.1	230
Nkhonde	*	*	*	*	*	*	20
Sena	88.1	77.1	83.2	75.0	93.1	48.0	85
Tonga	83.7	73.6	79.0	76.7	92.9	41.8	47
Tumbuka	83.6	70.1	76.2	79.3	89.8	39.1	242
Yao	84.2	74.3	78.9	80.5	87.5	43.3	216
Other	85.1	79.4	87.9	77.6	93.7	46.8	99
Age							
15-19	82.7	69.1	78.4	81.8	92.8	41.1	937
20-24	86.5	76.1	86.6	79.9	92.4	47.5	1,121
Total 15-24	84.4	72.3	82.1	80.9	92.6	44.0	2,058

[1]Relates to Global AIDS Monitoring indicator 5.1: Young people: Knowledge about HIV prevention.

[2]Includes only participants who answered all five questions.

[3]Church of Central Africa Presbyterian.

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

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

Table 13.4.C Young people, knowledge about HIV prevention: Total

Among males and females ages 15-24 years, percentage who correctly identify both ways of preventing the sexual transmission of HIV and reject major misconceptions about HIV transmission, by selected demographic characteristics, MPHIA 2015-2016

Characteristic	Percentage who correctly answered the questions						Number[2]
	Can the risk of HIV transmission be reduced by having sex with only one uninfected partner who has no other partners?	Can a person reduce the risk of getting HIV by using a condom every time they have sex?	Can a healthy-looking person have HIV?	Can a person get HIV from mosquito bites?	Can a person get HIV by sharing food with someone who is infected?	All five questions	
Residence							
Urban	90.6	80.3	89.5	84.1	94.0	55.5	1,453
Rural	84.5	75.4	82.2	79.0	92.3	44.7	2,146
Zone							
North	85.2	76.7	82.0	77.3	91.8	44.6	485
Central-East	83.9	72.7	81.0	80.5	93.3	47.8	485
Central-West	81.1	70.8	81.4	80.5	92.6	37.7	378
Lilongwe City	91.1	81.1	88.8	85.2	94.1	55.7	662
South-East	87.5	77.2	83.2	78.9	91.5	46.3	425
South-West	87.4	81.0	86.3	77.8	92.3	50.4	555
Blantyre City	90.9	82.9	91.0	87.7	96.3	61.4	609
Marital status							
Never married	85.3	76.9	82.4	81.4	92.7	48.2	2,270
Married or living together	87.2	75.4	87.8	77.0	92.4	44.5	1,133
Divorced or separated	83.5	76.8	79.0	80.3	93.9	45.3	181
Widowed	*	*	*	*	*	*	9
Education							
No education	69.0	69.7	80.8	70.6	87.5	34.2	110
Primary	83.1	74.4	79.2	76.3	91.7	39.7	1,960
Secondary	92.2	80.6	91.5	87.1	94.8	60.0	1,393
More than secondary	94.4	83.1	99.3	96.8	98.6	78.3	135
Wealth quintile							
Lowest	81.8	74.0	85.3	72.7	88.3	38.8	395
Second	84.4	74.7	80.6	76.4	92.1	41.8	475
Middle	84.5	74.8	80.5	80.1	91.9	43.4	558
Fourth	85.3	76.8	82.0	82.0	95.1	47.5	754
Highest	90.4	80.0	89.2	84.7	93.9	57.4	1,417
Religion							
Catholic	85.5	74.6	81.6	82.2	92.4	46.3	731
CCAP[3]	89.0	78.5	87.2	82.6	95.7	51.4	688
Anglican	91.9	88.3	84.3	87.3	93.4	64.1	92
Seventh Day Adventist	90.7	78.0	89.4	82.9	93.1	55.2	281
Baptist	84.5	73.4	83.6	75.4	90.1	33.9	96
Other Christian	84.8	74.7	84.3	77.0	93.3	44.1	1,076
Muslim	83.8	79.0	82.3	78.2	88.6	43.9	370
Other	79.8	75.9	75.2	81.4	92.6	44.5	221
None	(85.4)	(74.6)	(85.6)	(81.4)	(86.8)	(57.4)	41
Ethnicity							
Chewa	84.8	72.4	82.0	80.8	93.7	44.0	1,220
Lomwe	89.7	81.9	87.0	81.0	95.4	53.4	701
Ngoni	86.2	80.0	90.0	82.4	90.9	51.7	406
Nkhonde	(76.7)	(75.3)	(82.1)	(81.4)	(92.0)	(50.7)	38
Sena	89.1	74.2	84.8	74.2	90.5	44.4	150
Tonga	83.0	79.3	85.7	80.1	95.4	48.8	87
Tumbuka	84.2	76.3	80.1	78.2	91.5	46.0	424
Yao	84.6	77.5	81.2	78.3	88.9	43.8	403
Other	87.4	82.6	88.8	80.3	92.2	51.9	158
Age							
15-19	83.8	74.4	79.5	80.2	92.0	43.1	1,793
20-24	88.3	79.0	88.9	79.8	93.5	51.7	1,806
Total 15-24	85.8	76.5	83.8	80.0	92.7	47.0	3,599

[1]Relates to Global AIDS Monitoring indicator 5.1: Young people: Knowledge about HIV prevention.

[2]Includes only participants who answered all five questions.

[3]Church of Central Africa Presbyterian.

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

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

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

13.5 HIV Incidence and Prevalence

Overall incidence among those ages 15-24 years was estimated at 0.22% (95% CI 0.02, 0.41), 0.05 among males and 0.38% among females. These figures, however, should be interpreted cautiously as MPHIA was designed to estimate incidence among the overall population ages 15-49 years and the precision of estimates for other age-sex subgroups is low (Table 5.3.B).

Overall HIV prevalence among those ages 15-24 years was 2.5% and twice as large in females (3.4%) as in males (1.5%). HIV prevalence was 2.0% and 5.2% in females ages 15-19 years and ages 20-24 years, respectively; and 0.9% and 2.3% in males in the corresponding age groups (Table 6.4.A).

13.6 HIV Testing, Treatment, and Viral Load Suppression

Among those ages 15-24 years, 58.2% reported that they had ever tested for HIV and received their results (48.0% among males and 67.9% among females). However, the percentage among those ages 15-19 years was half that among those ages 20-24 years (40.4% vs.79.9%, respectively). Recent testing was lower, with 33.2% of those ages 15-24 years reporting testing in the 12 months preceding the survey (26.8% among males and 39.3% among females) (Tables 7.3.A , 7.3.B, and 7.3.C).

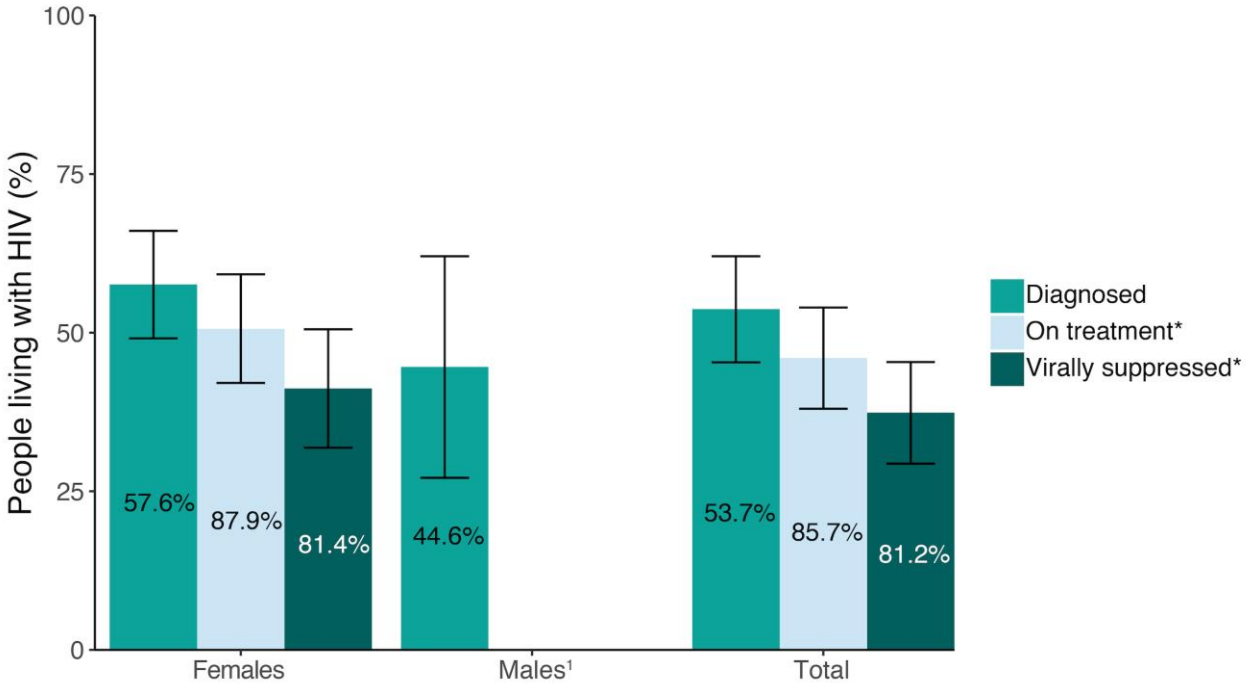
Among HIV-positive adolescents and young adults ages 15-24 years, 50.2% were unaware of their status according to self-report, while 41.1% were on ART, and 8.7% reported awareness of HIV status, but not yet on ART. The percentage unaware was higher among males (62.9%) than among females (44.7%) (Tables 8.3.A, 8.3.B and 8.3.C).

Viral load suppression was observed in 39.3% and 49.2% of those ages 15-19 years and ages 20-24 years living with HIV, respectively. Overall, 37.2% of HIV-positive males and 49.7% of HIV-positive females ages 15-24 years were virally suppressed (Tables 9.4.A and 9.4.B).

13.7 Status of the UNAIDS 90-90-90 Targets

Based on self-report and detection of ARVs in blood, it is estimated that 53.7% of those living with HIV ages 15-24 years had been diagnosed with HIV (44.6% of males and 57.6% of females), and that among those who had been previously diagnosed, 85.7% were on ART. Among those on treatment, 81.2% had VLS (Table 10.3.B and Figure 13.7.A).

Figure 13.7.A: Young adults 90-90-90 (laboratory ARV-adjusted data[a] among young adults ages 15-24 years), MPHIA 2015-2016



[a] In the antiretroviral (ARV)-adjusted 90-90-90 participants are classified as 'Aware' or 'Diagnosed' if they self-reported HIV positive before testing HIV positive in MPHIA and/or had detectable ARVs in their blood. Participants are classified as 'On Treatment' if they self-reported that they were on treatment and/or if they had detectable ARVs in their blood.
*Inset numbers are conditional proportions.
[1] Estimates are suppressed due to less than 25 observations.

13.8 Gaps and Unmet Needs

- Among adolescents and young adults ages 15-24 years, 53% lack correct knowledge about HIV transmission and prevention, with 19% of males and 28% of females not knowing that the risk of sexual acquisition of HIV can be reduced by consistent condom use.
- More than one in eight persons (13.7%) ages 15-24 years reported having sexual intercourse before the age of 15 years. Sexual debut before the age of 15 years was especially high among those with no education.
- Among those ages 15-24 years living with HIV, 46% had not been diagnosed, and among those diagnosed, 14% had not initiated ART. Among those on treatment, 19% have not achieved VLS.
- Overall, among those ages 15-24 years living with HIV, close to 63% of males and 50% of females do not have VLS.

13.9 References

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

14 CHILDREN

14.1 Key Findings

- The estimated prevalence of HIV infection among children ages 0-14 years was 1.5%.
- **Diagnosed:** Based on parents' report and ARV detection data, it was estimated that in Malawi, 69.3% of children living with HIV were diagnosed.
- **On treatment:** Based on parents' report and ARV detection data, it was estimated that 86.1% of HIV-positive children who have been diagnosed were on ART.
- **Virally suppressed:** Among children who were on ART, 57.9% were virally suppressed.

14.2 Background

Estimates of prevalence of HIV in children, estimates of children living with HIV, and VLS among children are most commonly derived indirectly from clinic-based data or epidemiologic models. The MPHIA provides direct measurements of these estimates among children ages 0-14 years, which are critical for meeting the needs of pediatric HIV treatment, planning for HIV prevention, care and treatment services for children, evaluating PMTCT programs, and addressing specific needs of children ages 10-14 years.

This chapter presents results on the UNAIDS 90-90-90 targets in children ages 0-14 years, using both parent/guardian-reported data (on awareness of child's HIV status and ARV use) and data on detectable ARVs. Analyses for the UNAIDS 90-90-90 tables for children were similar to that described for adults in Chapter 10. Parents or guardians were asked about a child's HIV infection status and ART use. Data on detectable ARVs were used in combination with self-reported ARV use to define awareness of HIV-positive status and ARV status of a child. Presence of detectable ARVs among children who were reported as HIV negative was used to reclassify the child as aware.

This chapter also presents results on the nutrition status of HIV-positive and a sub-sample of HIV-negative children using two indices: height-for-age and weight-for-age. Stunting, or low height-for-age, reflects inadequate nutrition over a long period of time. Children whose height-for-age Z-score is below minus two standard deviations (-2 SD) from the WHO Child Growth Standards median are considered stunted or chronically undernourished. Children who are below minus three standard deviations (-3 SD) are considered severely stunted.

Underweight, or low weight-for-age captures both inadequate nutrition in the period immediately before the survey as well as and long-term undernutrition. Underweight is therefore an indicator of overall undernutrition. Children whose weight-for-age Z-score is below minus two standard deviations (-2 SD) from the WHO Child Growth Standards median are classified as underweight. Children whose weight-for-age Z-score is below minus three standard deviations (-3 SD) from the WHO Child Growth Standards median are considered severely underweight

The means of the Z-scores are presented as summary statistics representing the nutrition status of all children in the population. The farther away the mean Z-scores are from 0, the higher the prevalence of undernutrition.

These indicators are presented for all HIV-positive children and 5% of HIV-negative children based on the child's HIV exposure (mother is HIV negative or mother is HIV positive, unknown, or dead) and HIV infection status. The HIV status of the mother and child was based on the HIV testing conducted in MPHIA.

14.3 HIV Prevalence

It is estimated that 1.5% of children under the age of 15 years were living with HIV (1.5% of males and 1.5% of females). The prevalence of HIV infection was 1.1% among those under five years of age, 1.6% among those ages 5-9 years, and 2.1% among those ages 10-14 years (Table 6.4.A)

14.4 Status of the UNAIDS 90-90-90 Targets

90-90-90 cascade based on guardian-reported HIV status and ART use in children:
Among all HIV-positive children (children who tested HIV positive in MPHIA) ages 0-14 years, 60.9% were reported by their parents as HIV positive, 83.0% were reported by their parent/guardian as receiving ARVs, and 54.0% were virally suppressed (Table 14.4.A).

90-90-90 cascade based on guardian-reported HIV status and ART use and/or detectable ARVs children:
ARV-adjusted awareness of HIV-positive status: Based on guardian-reported HIV-positive status of the child and/or presence of detectable ARVs, 69.3% of HIV-positive children ages 0-14 years were classified as aware (ARV-adjusted awareness) (Table 14.4.B, Figure 14.4.A).

ARV-adjusted treatment status: Using guardian-reported ARV status of the child and/or detectable ARVs, 86.1% of children with ARV-adjusted awareness, were classified as being on ART (Table 14.4.B, Figure 14.4.A).

Viral load suppression: Among children with ARV-adjusted treatment status, 57.9% were virally suppressed (Table 14.4.B, Figure 14.4.A).

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

90-90-90 targets among people living with HIV ages 0-14 years, by age MPHIA 2015-2016

	Diagnosed	
	Total	
Age	Percentage whose parent reported that the child is HIV positive	Number
0-17 months	*	2
18-59 months	*	17
0-4 years	*	19
5-9 years	(62.1)	31
10-14 years	(62.0)	37
0-14 years	60.9	87

	On Treatment	
	Among children whose parent reported that the child is HIV positive	
Age	Percentage whose parent reported that the child is on ART	Number
0-17 months	*	0
18-59 months	*	9
0-4 years	*	9
5-9 years	*	19
10-14 years	*	23
0-14 years	83.0	51

	Virally Suppressed	
	Among children whose parent reported that the child is on ART	
Age	Percentage virally suppressed	Number
0-17 months	*	0
18-59 months	*	8
0-4 years	*	8
5-9 years	*	12
10-14 years	*	21
0-14 years	(54.0)	41

Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.
An asterisk indicates that an estimate is based on a very small number (less than 25) of unweighted cases and has been suppressed.

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

90-90-90 targets among people living with HIV ages 0-14 years, by age MPHIA 2015-2016

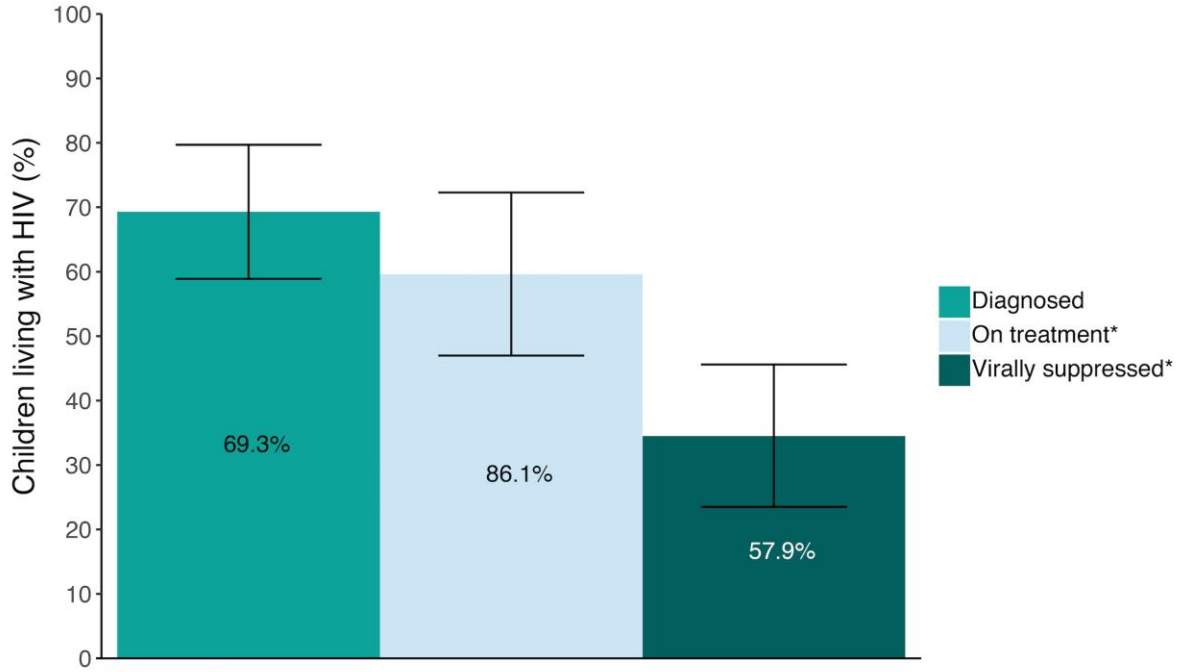
	Diagnosed	
	Total	
Age	Percentage whose parent reported that the child is HIV positive AND/OR with detectable ARVs	Number
0-17 months	*	2
18-59 months	*	18
0-4 years	*	20
5-9 years	(72.2)	37
10-14 years	(67.0)	38
0-14 years	69.3	95

	On Treatment	
	Among children whose parent reported that the child is HIV positive AND/OR with detectable ARVs	
Age	Percentage whose parent reported the child was on ART AND/OR with detectable ARVs	Number
0-17 months	*	0
18-59 months	*	12
0-4 years	*	12
5-9 years	(75.8)	28
10-14 years	(90.2)	27
0-14 years	86.1	67

	Virally Suppressed	
	Among children whose parent reported the child was on ART AND/OR with detectable ARVs	
Age	Percentage virally suppressed	Number
0-17 months	*	0
18-59 months	*	11
0-4 years	*	11
5-9 years	*	21
10-14 years	(63.0)	25
0-14 years	57.9	57

Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.
An asterisk indicates that an estimate is based on a very small number (less than 25) of unweighted cases and has been suppressed.

Figure 14.4.A Pediatric 90-90-90 (laboratory ARV-adjusted data[a]), MPHIA 2015-2016



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

14.5 Nutrition Status

Among HIV unexposed children (i.e. children born to an HIV-negative mother), 12.4% were stunted and 32.0% were severely stunted. Among HIV exposed and uninfected children (i.e. HIV-negative children born to HIV-positive mothers), 43.6% were stunted and 7.5% were severely stunted (Table 14.5.A).

Among HIV-unexposed children, 5.1% were underweight while 28.8% of HIV-exposed and uninfected children were underweight (Table 14.5.A).

Table 14.5.A Nutritional status of children ages 0-59 months

Prevalence of undernutrtion among HIV-positive[1] and HIV-negative children ages 0-59 months by mother's HIV status, according to two anthropometric indices of nutritional status: height-for-age and weight-for-age[2], MPHIA 2015-2016

Mother's HIV Status	Child's Status	Height-for-age			
		Percentage below -3 SD	Percentage below -2 SD[3]	Mean Z-score (SD)	Number of children
HIV-positive, unknown, dead	HIV-positive	*	*	*	16
	HIV-negative	(7.5)	(43.6)	(-1.1)	44
	Total	8.6	43.2	-1.2	60
HIV-negative	HIV-positive	*	*	*	0
	HIV-negative	(32.0)	(12.4)	(-2.0)	49
	Total	(32.0)	(12.4)	(-2.0)	49

Mother's HIV Status	Child's Status	Weight-for-age			
		Percentage below -3 SD	Percentage below -2 SD[3]	Mean Z-score (SD)	Number of children
HIV-positive, unknown, dead	HIV-positive	*	*	*	19
	HIV-negative	0.1	28.8	(-0.9)	45
	Total	0.4	27.9	-1.0	64
HIV-negative	HIV-positive	*	*	*	0
	HIV-negative	0.0	5.1	-0.7	62
	Total	0.0	5.1	-0.7	62

[1]Child's HIV status as defined by the result of the child's MPHIA HIV test result.
[2]Each index is expressed in standard deviation units (SD) from the median of the WHO Child Growth Standards.
[3]Includes children who are below -3 standard deviations (SD) from the WHO Child Growth Standards.

14.6 Gaps and Unmet Needs

- Close to 31% of children under the age of 15 years who were living with HIV had not been diagnosed, and close to 14% of those diagnosed had not initiated ART. Among those receiving treatment, 42% were not virally suppressed.
- Overall among children under 15 years living with HIV, 42.3% were not virally suppressed.

15 HIV Risk Factors

15.1 Key Findings

- Among adults ages 15-64 years who reported sexual debut before the age of 15 years, the estimated HIV prevalence was 16.8% for females and 7% for males.
- The HIV prevalence in women ages 15-64 years, who reported engaging in paid sexual intercourse in the 12 months preceding the survey, was 23.2%. Among those women who did not engage in paid sexual intercourse, HIV prevalence was 11.7%.
- Among males ages 15-64 years, condom use at last sexual intercourse in the 12 months preceding the survey was reported by 34.4% of those HIV positive who self-reported being on ART, 20.6% of those who were HIV positive but unaware of their status, and 18.9% of those who were HIV negative.
- Among females ages 15-64 years, condom use at last sexual intercourse in the 12 months preceding the survey was reported by 26.0% of those HIV positive who self-reported being on ART, 12.4% of those who were HIV positive but unaware of their status, and 11.1% of those who were HIV negative.
- Among sexually active adults ages 15-64 years, 27.6% reported having sex with a non-marital or non-cohabiting partner in the 12 months preceding the survey, of whom 51.4% reported using a condom during their last sexual intercourse with a non-marital or non-cohabiting partner.
- Among men ages 15-64 years, 9.2% reported to have undergone medical circumcision (16.1% to have had a non-medical circumcision and 69.9% to be uncircumcised)

15.2 Background

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

Since 2007, WHO and UNAIDS have recommended VMMC as a cost-effective strategy to reduce female-to-male sexual transmission of HIV. To inform VMMC programs, males ages 15-64 years were asked if they had been medically or traditionally circumcised.

15.3 HIV Prevalence by Sexual Behavior

Among adults ages 15-64 years in each category defined by age of sexual debut, the prevalence of HIV infection was higher for females than for males. However, the major disparity was observed for those who reported sexual intercourse before the age of 15 years, with females having an HIV prevalence of 16.8%, which is more than twice as high as the prevalence among males in the same category (7.0%) (Table 15.3.A).

Among males ages 15-64 years, HIV prevalence was similar for those who reported one partner (10.0%) and for those who reported two or more partners (9.0%) in the 12 months preceding the survey. However, HIV prevalence among women with two or more partners in the 12 months preceding the survey (20.9%) was nearly twice as high as the prevalence in women reporting one partner in the same time period (11.6%) (Table 15.3.A).

HIV prevalence among persons ages 15-64 years who reported that they used a condom at last sexual intercourse in the year preceding the survey was 17.8%, compared to 9.2% among persons who reported that they did not use a condom at last sex.

The MPHIA defined paid sexual intercourse as paying or receiving money for sexual intercourse. HIV prevalence in women ages 15-64 years who reported engaging in this activity in the year preceding the survey was twice as high as in those who did not (23.2% versus 11.7%, respectively). However, among those females who engaged in paid sexual intercourse, HIV prevalence was similar among those who used a condom during the last paid sexual intercourse (24.7%) and those who did not (22.7%). HIV prevalence in men ages 15-64 years who reported that they did and did not engage in paid sexual intercourse in the 12 months preceding the survey was 8.0% and 9.9%, respectively (Table 15.3.A).

Table 15.3.A HIV prevalence by sexual behavior

Prevalence of HIV among persons age 15-64 years, by sex and sexual behavior characteristics, MPHIA 2015-2016

Characteristic	Males		Females		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
Age at first sexual intercourse						
<15	7.0	881	16.8	816	11.0	1,697
15-19	10.0	3,401	13.6	6,237	12.1	9,638
20-24	9.2	1,430	12.9	1,562	10.8	2,992
≥25	11.6	411	16.1	179	12.7	590
Number of sexual partners in the past 12 months						
0	7.7	887	22.4	1,592	16.3	2,479
1	10.0	3,924	11.6	6,882	10.9	10,806
≥2	9.0	1,299	20.9	318	10.7	1,617
Condom use at last sexual intercourse in the past 12 months						
Used condom	13.3	1,225	24.6	1,150	17.8	2,375
Did not use condom	8.7	3,989	9.7	6,043	9.2	10,032
No sexual intercourse in the past 12 months	7.7	887	22.4	1,592	16.3	2,479
Paid sexual intercourse in the past 12 months						
Yes[1]	8.0	449	23.2	195	11.9	644
Used condom at last paid sexual intercourse	7.1	312	24.7	102	10.5	414
Did not use condom at last paid sexual intercourse	9.7	136	22.7	90	14.4	226
No[2]	9.9	4,763	11.7	6,993	10.8	11,756
Total 15-24	1.5	2,678	3.4	3,580	2.5	6,258
Total 15-49	7.8	6,306	12.1	8,949	10.0	15,255
Total 15-64	8.5	7,208	12.5	9,979	10.6	17,187

[1]Includes persons who paid or received money for sexual intercourse.
[2]No paid sexual intercourse or no sexual intercourse in the past 12 months.
The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

15.4 Sexual Behavior According to HIV and Antiretroviral Therapy Status

Among HIV-positive men ages 15-64 years, the percentage reporting two or more sexual partners in the 12 months preceding the survey varied according to reported awareness of status and care, with 24.0% of those who were unaware of their HIV status, 20.3% of those aware but not on ART, and 18.0% of those on ART having reported two or more sexual partners. Overall, condom use was low. However, HIV-positive men on ART reported using a condom at the last sexual intercourse in the 12 months preceding the survey with a higher frequency (34.4%) than those unaware of their status (20.6%) or than those aware, but not on ART (17.0%). Among HIV-positive men, who according to self-report were unaware of their status, 60.7% reported not using a condom during the last sexual intercourse with a non-marital, non-cohabiting partner in the 12 months preceding the survey, while 50.4% of HIV-positive men on ART, and 45.4% of HIV-negative men reported not using a condom at last sex with a non-marital, non-cohabiting partner. Among HIV-positive men, 4.8% of those unaware of their HIV status and 16.5% of those aware of their HIV status, but not on ART, reported paying for sexual intercourse in the 12 months preceding the survey (Table 15.4.A).

Among HIV-positive women ages 15-64 years who were unaware of their HIV status, 7.9% reported having two or more sexual partners in the 12 months preceding the survey, while 5.6% of those

aware, but not on ART, and 3.9% of those on ART reported having two or more sexual partners in the same time period. As in males, condom use was low. However, HIV-positive women on ART reported using a condom at the last sexual intercourse in the 12 months preceding the survey with a higher frequency (26.0%) than those unaware of their status (12.4%), aware but not on ART (10.8%), and those HIV negative (11.1%). Among HIV-positive women who were unaware of their status, 68.1% reported not using a condom during last sex with a non-marital, non-cohabiting partner in the 12 months preceding the survey, while 56.6% of HIV-positive women on ART and 53.8% of HIV-negative women reported not using a condom at last sex with a non-marital, non-cohabiting partner. Among HIV-positive women, 4.7% of those unaware of their HIV status and 10.6% of those aware, but not on ART, reported paid sexual intercourse in the 12 months preceding the survey (Table 15.4.B).

Among both males and females ages 15-64 years, sexual intercourse using a condom in the 12 months preceding the survey was reported by those HIV positive, who self-reported awareness of their status and on ART, with a higher frequency than by those who were HIV negative (34.4% versus 18.9%, respectively, among males; and 26.0% versus 11.1% respectively, among females). In addition, 31.8% of HIV-positive females who reported awareness of HIV status and ART use reported not having sexual intercourse in the 12 months preceding the survey, compared to 16.5% of HIV-negative females (Tables 15.4.A and 15.4.B). These findings may help to elucidate the observations in Table 15.3.A of high HIV prevalence among those who reported using a condom at last sexual intercourse and among those not having sexual intercourse in the 12 months preceding the survey.

Table 15.4.A Sexual behavior according to HIV status: Males

Sexual behavior in the 12 months preceding the survey according to HIV status, MPHIA 2015-2016

Characteristic	HIV-positive			HIV Negative (N=6493)
	Unaware of HIV status (N=230)	Aware of HIV Status		
		Not on ART[3] (N=62)	On ART (N=419)	
Number of sexual partners in the past 12 months				
0	10.2	13.9	10.3	14.2
1	65.8	65.8	71.8	64.5
≥2	24.0	20.3	18.0	21.3
Condom use at last sexual intercourse in the past 12 months				
Used condom	20.6	17.0	34.4	18.9
Did not use condom	69.2	69.1	55.4	66.9
No sexual intercourse in the past 12 months	10.2	13.9	10.3	14.2
Condom use at last sex with a non-marital non-cohabiting partner				
Used condom	39.3	*	49.6	54.6
Did not use condom	60.7	*	50.4	45.4
Paid sexual intercourse in the past 12 months				
Yes[1]	4.8	16.5	6.5	8.3
Used condom at last paid sexual intercourse	*	*	*	70.7
Did not use condom at last paid sexual Intercourse	*	*	*	29.3
No[2]	95.2	83.5	93.5	91.7
Total 15-64	100.0	100.0	100.0	100.0

[1]Includes persons who paid or received money for sexual intercourse. [2]No paid sexual intercourse or no sexual intercourse in the past 12 months.
[3]ART: antiretroviral therapy. An asterisk indicates that an estimate is based on a very small number (less than 25) of unweighted cases and has been suppressed. The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

Table 15.4.B Sexual behavior according to HIV status: Females

Sexual behavior in the 12 months preceding the survey according to HIV status, MPHIA 2015-2016

Characteristic	HIV-positive			HIV Negative (N=8467)
	Unaware of HIV status (N=352)	Aware of HIV Status		
		Not on ART[3] (N=111)	On ART (N=1040)	
Number of sexual partners in the past 12 months				
0	23.1	30.0	31.8	16.5
1	69.0	64.4	64.3	80.5
≥2	7.9	5.6	3.9	3.0
Condom use at last sexual intercourse in the past 12 months				
Used condom	12.4	10.8	26.0	11.1
Did not use condom	64.4	59.2	42.1	72.4
No sexual intercourse in the past 12 months	23.1	30.0	31.9	16.5
Condom use at last sex with a non-marital non-cohabiting partner				
Used condom	31.9	(16.4)	43.4	46.2
Did not use condom	68.1	(83.6)	56.6	53.8
Paid sexual intercourse in the past 12 months				
Yes[1]	4.7	10.6	5.5	2.4
Used condom at last paid sexual intercourse	*	*	(38.8)	50.9
Did not use condom at last paid sexual intercourse	*	*	(61.2)	49.1
No[2]	95.3	89.4	94.5	97.6
Total 15-64	100.0	100.0	100.0	100.0

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

15.5 Condom Use at Last Sex with a Non-Marital, Non-Cohabiting Partner

Overall among adults ages 15-64 years who reported having sex in the year preceding the survey, 27.6% (35.6% of males and 19.8% of females) reported having sex with a non-marital, non-cohabiting partner during this time. Of these adults, 51.4% (54.8% of males and 45.4% of females) reported using a condom during their last sexual intercourse with this non-marital, non-cohabiting partner (Tables 15.5.A, Table 15.5.B and Table 15.5.C).

The percentage of sexually-active persons reporting sexual intercourse with a non-marital, non-cohabiting partner was higher among those residing in urban areas (35.5%) than among those in rural areas (25.7%), with the highest percentages in Blantyre City and Lilongwe City (36.6% and 35.7%, respectively). The percentage of sexually active persons reporting sexual intercourse with a non-marital, non-cohabiting partner increased with educational level from 13.0% among those with no education to 39.9% among those with more than secondary education. It also increased with wealth from 23.5% among those in the lowest wealth quintile to 35.1% among those in the highest quintile. The percentage reporting condom use at last sexual intercourse with a non-marital, non-cohabiting partner followed a similar pattern, and increased with educational attainment from 36.7% among those with no education to 66.2% among those with more than secondary education, and with wealth, from 43.2% among those in the lowest wealth quintile to 59.2% among those in the highest quintile (Table 15.5.C).

The percentages of sexually-active adults that reported sexual intercourse with non-marital, non-cohabiting partners and condom use at last sexual intercourse with this type of partners decreased from the youngest age groups to the oldest. Among sexually active persons ages 15-19 years, 72.4% (90.7% of males and 57.2% of females) reported having sex with a non-marital, non-cohabiting partner and 59.2% (58.3% of males and 60.4% of females) reported using a condom at last sexual intercourse with such partner, while among those ages 55-59 years, 5.9% reported having sex with a non-marital, non-cohabiting partner and 28.4% reported using a condom at last sex with such a partner (Tables 15.5.A, Table 15.5.B, and Table 15.5.C).

Table 15.5.A Condom use at last sex with a non-marital, non-cohabitating partner: Males

Among males age 15-64 years who reported having sex in the past 12 months, percentage who reported having a non-marital, non-cohabitating partner in the past 12 months; among those who reported having sex with a non-marital, non-cohabiting partner in the past 12 months, percentage who reported using a condom the last time they had sex with a non-marital, non-cohabiting partner, by selected demographic characteristics, MPHIA 2015-2016

Characteristic	Among males who reported having sex in the past 12 months		Among males who reported having sex with a non-marital, non-cohabiting partner in the past 12 months	
	Percentage who reported having sex with a non-marital, non-cohabiting partner in the past 12 months	Number	Percentage who reported using a condom the last time they had sex with a non-marital, non-cohabiting partner[1]	Number
Residence				
Urban	45.5	2,205	59.4	1,008
Rural	33.1	3,775	53.1	1,186
Zone				
North	38.5	761	59.3	267
Central-East	31.6	928	67.1	270
Central-West	28.5	738	49.9	198
Lilongwe City	44.9	1,015	56.0	460
South-East	36.3	681	47.7	234
South-West	38.1	908	51.3	327
Blantyre City	45.1	949	55.4	438
Marital status				
Never married	92.7	1,403	62.3	1,299
Married or living together	14.8	4,305	45.1	644
Divorced or separated	91.3	246	39.7	227
Widowed	*	19	*	18
Education				
No education	19.0	300	49.5	60
Primary	32.6	3,248	48.9	1,054
Secondary	43.5	2,016	62.2	892
More than secondary	42.0	415	65.3	187
Wealth quintile				
Lowest	27.9	649	52.7	182
Second	30.6	899	47.5	268
Middle	30.1	955	50.1	275
Fourth	38.4	1,284	54.3	488
Highest	45.5	2,193	61.9	981
Religion				
Catholic	35.0	1,180	56.4	439
CCAP[2]	37.3	1,144	60.9	425
Anglican	43.2	140	56.7	58
Seventh Day Adventist	41.5	397	57.2	170
Baptist	39.0	153	46.6	59
Other Christian	33.3	1,774	53.7	604
Muslim	42.2	538	52.4	244
Other	29.4	452	44.2	135
None	28.9	189	47.3	58
Ethnicity				
Chewa	34.2	2,029	54.6	710
Lomwe	35.5	1,159	48.2	430
Ngoni	33.4	741	56.8	273
Nkhonde	25.6	54	*	13
Sena	43.2	252	58.3	107
Tonga	42.4	96	(72.3)	39
Tumbuka	39.3	638	61.1	242
Yao	40.0	649	54.5	278
Other	27.5	357	53.2	98

Table 15.5.A Condom use at last sex with a non-marital, non-cohabitating partner: Males (continued)

	Among males who reported having sex in the past 12 months		Among males who reported having sex with a non-marital, non-cohabiting partner in the past 12 months	
Characteristic	Percentage who reported having sex with a non-marital, non-cohabiting partner in the past 12 months	Number	Percentage who reported using a condom the last time they had sex with a non-marital, non-cohabiting partner[1]	Number
Age				
15-19	90.7	596	58.3	535
20-24	61.1	1,000	64.1	655
25-29	33.2	942	50.5	359
30-34	24.2	884	48.9	241
35-39	21.0	762	43.9	179
40-44	15.2	586	40.2	100
45-49	10.3	413	(34.8)	48
50-54	10.3	325	(19.5)	37
55-59	7.8	258	*	21
60-64	7.4	214	*	19
Total 15-24	72.3	1,596	61.4	1,190
Total 15-49	39.1	5,183	55.7	2,117
Total 15-64	35.6	5,980	54.8	2,194

[1]Relates to Global AIDS Monitoring indicator 3.18: Condom use at last high-risk sex.
[2]Church of Central Africa Presbyterian.
Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.
An asterisk indicates that an estimate is based on a very small number (less than 25) of unweighted cases and has been suppressed.
The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

Table 15.5.B Condom use at last sex with a non-marital, non-cohabitating partner: Females

Among females age 15-64 years who reported having sex in the past 12 months, percentage who reported having a non-marital, non-cohabitating partner in the past 12 months; among those who reported having sex with a non-marital, non-cohabiting partner in the past 12 months, percentage who reported using a condom the last time they had sex with a non-marital, non-cohabiting partner, by selected demographic characteristics, MPHIA 2015-2016

Characteristic	Among females who reported having sex in the past 12 months		Among females who reported having sex with a non-marital, non-cohabiting partner in the past 12 months	
	Percentage who reported having sex with a non-marital, non-cohabiting partner in the past 12 months	Number	Percentage who reported using a condom the last time they had sex with a non-marital, non-cohabiting partner[1]	Number
Residence				
Urban	24.7	3,055	50.6	736
Rural	18.6	5,125	43.8	883
Zone				
North	18.2	951	58.1	159
Central-East	16.5	1,160	54.9	165
Central-West	15.4	979	40.4	137
Lilongwe City	25.8	1,431	50.3	342
South-East	21.4	1,048	39.8	210
South-West	22.4	1,328	38.3	277
Blantyre City	27.2	1,283	49.8	329
Marital status				
Never married	88.9	873	59.1	777
Married or living together	2.4	6,511	46.8	167
Divorced or separated	83.3	680	27.5	575
Widowed	93.1	108	36.0	96
Education				
No education	10.4	827	26.7	86
Primary	17.4	4,963	40.1	800
Secondary	31.7	2,062	55.8	615
More than secondary	35.8	325	68.2	118
Wealth quintile				
Lowest	19.8	1,000	31.8	187
Second	16.6	1,196	38.5	188
Middle	18.2	1,338	40.1	230
Fourth	19.1	1,646	54.5	292
Highest	24.2	3,000	53.7	722
Religion				
Catholic	21.2	1,524	49.6	335
CCAP[2]	21.2	1,497	58.3	325
Anglican	25.1	193	(64.3)	41
Seventh Day Adventist	24.0	583	41.3	142
Baptist	21.7	209	(43.4)	42
Other Christian	17.5	2,767	40.3	483
Muslim	20.1	778	38.4	143
Other	17.1	567	34.1	97
None	18.1	56	*	11

Table 15.5.B Condom use at last sex with a non-marital, non-cohabitating partner: Females (continued)

Characteristic	Among females who reported having sex in the past 12 months		Among females who reported having sex with a non-marital, non-cohabiting partner in the past 12 months	
	Percentage who reported having sex with a non-marital, non-cohabiting partner in the past 12 months	Number	Percentage who reported using a condom the last time they had sex with a non-marital, non-cohabiting partner[1]	Number
Ethnicity				
Chewa	16.8	2,747	45.5	458
Lomwe	24.4	1,731	41.1	411
Ngoni	21.3	1,026	47.9	228
Nkhonde	20.0	78	*	15
Sena	18.9	335	38.4	61
Tonga	25.1	142	(66.5)	37
Tumbuka	18.2	804	60.0	149
Yao	21.5	880	39.6	181
Other	17.2	421	44.6	74
Age				
15-19	57.2	803	60.4	461
20-24	22.3	1,863	46.1	468
25-29	13.8	1,533	33.6	227
30-34	12.2	1,360	31.2	181
35-39	14.3	977	24.4	143
40-44	11.5	633	39.2	74
45-49	8.2	435	(24.0)	34
50-54	6.3	292	*	19
55-59	3.0	178	*	6
60-64	5.4	106	*	6
Total 15-24	35.6	2,666	54.8	929
Total 15-49	21.0	7,604	45.8	1,588
Total 15-64	19.8	8,180	45.4	1,619

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

[2]Church of Central Africa Presbyterian.

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

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

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

Table 15.5.C Condom use at last sex with a non-marital, non-cohabitating partner: Total

Among persons age 15-64 years who reported having sex in the past 12 months, percentage who reported having a non-marital, non-cohabitating partner in the past 12 months; among those who reported having sex with a non-marital, non-cohabiting partner in the past 12 months, percentage who reported using a condom the last time they had sex with a non-marital, non-cohabiting partner, by selected demographic characteristics, MPHIA 2015-2016

Characteristic	Among persons who reported having sex in the past 12 months		Among persons who reported having sex with a non-marital, non-cohabiting partner in the past 12 months	
	Percentage who reported having sex with a non-marital, non-cohabiting partner in the past 12 months	Number	Percentage who reported using a condom the last time they had sex with a non-marital, non-cohabiting partner[1]	Number
Residence				
Urban	35.5	5,260	56.4	1,744
Rural	25.7	8,900	49.7	2,069
Zone				
North	28.7	1,712	58.9	426
Central-East	24.2	2,088	63.1	435
Central-West	22.0	1,717	46.6	335
Lilongwe City	35.7	2,446	54.0	802
South-East	28.2	1,729	44.4	444
South-West	29.8	2,236	46.1	604
Blantyre City	36.6	2,232	53.4	767
Marital status				
Never married	91.4	2,276	61.3	2,076
Married or living together	8.3	10,816	45.4	811
Divorced or separated	85.8	926	31.5	802
Widowed	93.4	127	37.1	114
Education				
No education	13.0	1,127	36.7	146
Primary	24.6	8,211	45.6	1,854
Secondary	38.8	4,078	60.1	1,507
More than secondary	39.9	740	66.2	305
Wealth quintile				
Lowest	23.5	1,649	43.2	369
Second	23.6	2,095	44.3	456
Middle	24.0	2,293	46.2	505
Fourth	28.9	2,930	54.3	780
Highest	35.1	5,193	59.2	1,703
Religion				
Catholic	28.1	2,704	53.8	774
CCAP[2]	29.5	2,641	60.0	750
Anglican	33.9	333	59.5	99
Seventh Day Adventist	32.3	980	51.0	312
Baptist	30.5	362	45.5	101
Other Christian	24.8	4,541	48.6	1,087
Muslim	30.1	1,316	47.3	387
Other	23.7	1,019	40.8	232
None	26.7	245	42.2	69

Table 15.5.C Condom use at last sex with a non-marital, non-cohabitating partner: Total (continued)

Characteristic	Among persons who reported having sex in the past 12 months		Among persons who reported having sex with a non-marital, non-cohabiting partner in the past 12 months	
	Percentage who reported having sex with a non-marital, non-cohabiting partner in the past 12 months	Number	Percentage who reported using a condom the last time they had sex with a non-marital, non-cohabiting partner[1]	Number
Ethnicity				
Chewa	25.5	4,776	51.7	1,168
Lomwe	29.7	2,890	45.1	841
Ngoni	27.2	1,767	53.3	501
Nkhonde	22.7	132	(45.6)	28
Sena	31.3	587	52.4	168
Tonga	33.6	238	70.1	76
Tumbuka	29.0	1,442	60.8	391
Yao	30.2	1,529	48.9	459
Other	22.7	778	50.1	172
Age				
15-19	72.4	1,399	59.2	996
20-24	40.0	2,863	58.6	1,123
25-29	23.1	2,475	45.3	586
30-34	18.1	2,244	42.9	422
35-39	17.7	1,739	36.1	322
40-44	13.4	1,219	39.8	174
45-49	9.3	848	30.2	82
50-54	8.6	617	22.8	56
55-59	5.9	436	(28.4)	27
60-64	6.6	320	(28.1)	25
Total 15-24	52.3	4,262	58.9	2,119
Total 15-49	29.8	12,787	52.0	3,705
Total 15-64	27.6	14,160	51.4	3,813

[1]Relates to Global AIDS Monitoring indicator 3.18: Condom use at last high-risk sex.
[2]Church of Central Africa Presbyterian.
Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.
An asterisk indicates that an estimate is based on a very small number (less than 25) of unweighted cases and has been suppressed.
The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

15.6 Male Circumcision

Among men ages 15-64 years, 9.2% reported undergoing medical circumcision and 16.1% reported having a non-medical circumcision. The percentage of males who reported being uncircumcised ranged from 65.8% among those ages 60-64 years to 73.2% among those ages 50-54 years. Among those who tested HIV positive in the survey, 8.8% reported having undergone medical circumcision, while 67.4% self-reported their status as uncircumcised. Of those who tested HIV negative, 71.7% self-reported not having undergone any form of circumcision, while 9.0% reported having undergone medical circumcision. The percentage of men who self-reported having undergone medical circumcision ranged from 2.4% in Central-West to 20.9% in Blantyre City (Table 15.6.A).

The proportion who reported medical circumcision was 10 times greater in men with more than secondary education (21.6%) compared to men with no education (2.5%). However, the frequency of non-medical circumcision was approximately three times greater in men with no education (25.3%) compared to men with more than secondary education (7.6%). The highest frequency of medical circumcision was reported among those in the highest wealth quintile (16.5%). As expected, the lowest

frequency of uncircumcised men was observed among those who identified as Muslim (3%), with the majority of them (79.5%) having undergone non-medical circumcision (Table 15.6.A).

Table 15.6.A Male circumcision

Percent distribution of males ages 15-64 years by self-reported circumcision status, by result of PHIA survey HIV test and selected demographic characteristics, MPHIA 2015-2016

Characteristic	Circumcised[1]		Uncircumcised	Unknown	Total	Number
	Medical circumcision	Non-medical circumcision				
Result of PHIA survey HIV test						
HIV positive	8.8	18.3	67.4	5.4	100.0	715
HIV negative	9.0	14.6	71.7	4.7	100.0	6,493
Not tested	10.8	24.3	60.0	4.9	100.0	1,076
Residence						
Urban	16.8	17.0	63.3	2.9	100.0	3,169
Rural	7.2	15.9	71.6	5.3	100.0	5,115
Zone						
North	3.5	2.8	85.2	8.4	100.0	1,109
Central-East	5.4	9.6	79.9	5.1	100.0	1,272
Central-West	2.4	7.6	85.0	5.0	100.0	951
Lilongwe City	17.5	13.2	66.1	3.2	100.0	1,464
South-East	14.0	44.4	37.2	4.4	100.0	910
South-West	13.3	16.7	67.0	3.0	100.0	1,217
Blantyre City	20.9	20.5	55.8	2.8	100.0	1,361
Marital status						
Never married	13.8	13.4	68.7	4.1	100.0	3,007
Married or living together	6.6	17.4	71.2	4.8	100.0	4,860
Divorced or separated	7.5	19.9	62.7	9.9	100.0	347
Widowed	6.3	23.6	63.2	7.0	100.0	58
Education						
No education	2.5	25.3	62.9	9.3	100.0	413
Primary	6.6	17.3	70.5	5.6	100.0	4,468
Secondary	13.7	13.4	70.1	2.8	100.0	2,857
More than secondary	21.6	7.6	68.0	2.7	100.0	543
Wealth quintile						
Lowest	5.0	16.6	71.8	6.6	100.0	877
Second	5.1	15.2	74.4	5.4	100.0	1,192
Middle	7.0	17.6	70.1	5.3	100.0	1,310
Fourth	8.7	16.1	70.4	4.8	100.0	1,750
Highest	16.5	15.5	65.0	3.1	100.0	3,155

Table 15.6.A Male circumcision (continued)

Characteristic	Circumcised[1]		Uncircumcised	Unknown	Total	Number
	Medical circumcision	Non-medical circumcision				
Religion						
Catholic	7.7	5.8	81.4	5.0	100.0	1,646
CCAP[2]	10.0	8.1	77.6	4.3	100.0	1,637
Anglican	11.6	15.2	70.1	3.1	100.0	209
Seventh Day Adventist	15.4	15.0	66.0	3.6	100.0	561
Baptist	5.8	8.2	80.2	5.7	100.0	207
Other Christian	7.9	9.5	77.4	5.2	100.0	2,370
Muslim	14.4	79.5	3.0	3.1	100.0	751
Other	7.5	8.5	76.1	7.9	100.0	640
None	3.3	4.9	88.9	2.9	100.0	245
Ethnicity						
Chewa	5.6	6.8	82.5	5.0	100.0	2,806
Lomwe	14.7	20.7	61.0	3.5	100.0	1,608
Ngoni	10.1	6.3	79.7	3.8	100.0	1,011
Nkhonde	3.5	0.0	87.2	9.3	100.0	85
Sena	10.0	4.7	81.8	3.5	100.0	335
Tonga	8.5	3.8	82.6	5.1	100.0	154
Tumbuka	5.4	1.9	84.7	7.9	100.0	941
Yao	14.1	71.9	10.7	3.4	100.0	881
Other	12.0	12.5	69.5	6.1	100.0	452
Age						
15-19	12.9	13.8	67.8	5.5	100.0	1,680
20-24	12.7	15.8	66.5	5.0	100.0	1,389
25-29	9.4	13.8	72.3	4.5	100.0	1,120
30-34	7.1	16.4	72.3	4.2	100.0	1,010
35-39	8.0	18.2	69.3	4.6	100.0	877
40-44	6.5	16.1	71.7	5.6	100.0	706
45-49	4.2	19.7	72.6	3.6	100.0	501
50-54	3.0	20.5	73.2	3.3	100.0	395
55-59	4.5	17.4	72.5	5.6	100.0	332
60-64	4.2	25.5	65.8	4.5	100.0	274
Total 15-24	12.8	14.7	67.2	5.3	100.0	3,069
Total 15-49	9.8	15.6	69.7	4.8	100.0	7,283
Total 15-64	9.2	16.1	69.9	4.8	100.0	8,284

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

15.7 Gaps and Unmet Needs

- The low percentage of reported condom use both overall and with high-risk (non-marital, non-cohabiting) sexual partners suggests that knowledge, access, and acceptability of condoms needs improvement.
- Among males ages 15-24 years, 67.2% reported to be uncircumcised. Among HIV-negative males ages 15-64 years, 71.7% reported to be uncircumcised.

16 INTIMATE PARTNER VIOLENCE

16.1 Key Findings

- Among ever-married or partnered women ages 15-64 years, 3.1% reported experiencing physical violence by a live-in partner in the 12 months preceding the survey.
- Among ever-married or partnered women ages 15-64 years, 1.3% reported experiencing sexual violence by a live-in partner in the 12 months preceding the survey.
- Of ever-married or partnered women ages 15-64 years, 4.1% reported experiencing physical or sexual violence by a live-in partner in the 12 months preceding the survey.
- Among ever-married or partnered women, 5.6% of women ages 15-19 years, and 4.8% of women ages 20-24 years, reported experiencing physical or sexual violence by a live-in partner in the 12 months preceding the survey.

16.2 Background

Intimate partner violence (IPV) is defined as physical violence, sexual violence, stalking, and psychological aggression (including coercive tactics) by a current or former intimate partner (i.e., spouse, boyfriend/girlfriend, dating partner, or ongoing sexual partner).[1] Exposure to IPV has been implicated in increased risk of contracting HIV in women, through mechanisms such as forced sex with an HIV-positive partner, an increase in risky sexual behaviors, and reduced ability to negotiate forms of safe sex (e.g., condom use).[2] Data from MPHIA will fill gaps in information on subnational prevalence estimates and demographic characteristics of women who experienced different forms of IPV. This chapter provides data on the nature of violence in this population, which can assist in the development of violence prevention programs.

This chapter reports the prevalence of experiencing sexual or physical violence perpetrated by a live-in partner in the last 12 months among ever married or partnered women. Sexual violence was defined in MPHIA as experiencing physical force or pressure to have sex. Physical violence was defined as experiencing punching, kicking, whipping, beating, slapping, pushing, shoving, choking, smothering, drowning or burning. It also included having an object thrown at you or being hurt or threatened with a knife, gun or other weapon. Prevalence numbers are broken down by age, education, region, and sociodemographic characteristics. Violence markers are measured against a woman's HIV status, as well as demographic characteristics.

Violence questionnaires were administered to one randomly-selected adult woman in each household. Questions were adapted from the Demographic and Health Survey as well as Violence Against Children Survey, which measures physical, emotional, and sexual violence in childhood, adolescence, and young adulthood (up to the age of 24 years). Women and adolescents reporting violence were offered referral to social services.

16.3 Prevalence of Recent Intimate Partner Violence

Among ever-married or partnered women ages 15-64 years, 3.1% reported experiencing physical violence, 1.3% reported experiencing sexual violence, and 4.1% reported experiencing either form of violence from a live-in intimate partner in the 12 months preceding the survey. Among young women ages 15-24 years, 3.3% reported experiencing physical violence, while 2.0% reported experiencing sexual violence, and 5.0% reported experiencing either form of violence. Self-reported sexual violence was highest among those ages 15-19 years (4.1%), while self-reported physical violence was highest among those ages 25-29 years (5.4%) (Table 16.3.A).

The prevalence of recent violence by a live-in partner in the last 12 months varied slightly by sociodemographic characteristics. Among women in urban areas, 5.9% reported either form of violence, compared to 3.8% in rural areas. In addition, the highest proportion of women who reported either form of violence was observed in Lilongwe City (6.9%) and Blantyre City (5.9%). Among women in Central East and Central West, 3.1% and 3.7%, respectively, reported experiencing either form of violence. Across educational levels, 5.3% of those with secondary education reported experiencing either form of violence, compared to 2.1% of those with no education. Among women in the highest wealth quintile, 5.3% reported experiencing violence compared to 2.9% among those in the lowest wealth quintile. Among women who tested HIV positive in MPHIA, 4.7% reported experiencing physical violence, compared to 3.0% among those who tested HIV negative (Table 16.3.A).

Table 16.3.A Prevalence of recent intimate partner violence

Among ever-married or partnered women ages 15-64 years, percentage who experienced physical or sexual violence from a live-in partner in the past 12 months[1], by woman's HIV status and selected demographic characteristics, MPHIA 2015-2016

Characteristic	Physical violence	Sexual violence	Physical and sexual violence	Physical or sexual violence[2]	Number of ever-married or partnered women
Result of PHIA survey HIV test					
HIV positive	4.7	0.8	0.1	5.5	1,141
HIV negative	3.0	1.5	0.3	4.2	5,348
Not tested	2.0	0.6	0.1	2.4	948
Residence					
Urban	4.4	1.7	0.3	5.9	2,527
Rural	2.8	1.2	0.2	3.8	4,910
Zone					
North	2.4	1.5	0.0	3.8	875
Central-East	2.8	0.4	0.2	3.1	1,001
Central-West	2.3	1.5	0.1	3.7	952
Lilongwe City	5.2	2.0	0.4	6.9	1,195
South-East	3.1	1.3	0.3	4.0	1,068
South-West	3.6	1.2	0.5	4.4	1,326
Blantyre City	4.4	1.7	0.2	5.9	1,020
Marital status					
Never married	*	*	*	*	-
Married or living together	3.4	1.4	0.3	4.5	6,094
Divorced or separated	2.7	1.0	0.1	3.6	912
Widowed	0.2	0.3	0.0	0.5	422
Education					
No education	1.6	0.5	0.0	2.1	967
Primary	3.2	1.3	0.2	4.4	4,725
Secondary	4.1	1.8	0.6	5.3	1,554
More than secondary	2.2	0.8	0.0	2.9	184
Wealth quintile					
Lowest	2.3	1.1	0.5	2.9	1,096
Second	2.9	1.7	0.1	4.5	1,237
Middle	3.3	0.9	0.3	3.9	1,258
Fourth	2.7	1.2	0.1	3.8	1,458
Highest	4.1	1.4	0.2	5.3	2,388
Religion					
Catholic	3.3	1.7	0.4	4.6	1,312
CCAP[3]	2.5	1.0	0.1	3.5	1,277
Anglican	5.7	0.2	0.0	5.9	162
Seventh Day Adventist	3.4	2.2	0.3	5.3	493
Baptist	2.9	0.8	0.2	3.5	187
Other Christian	3.2	1.0	0.3	3.9	2,653
Muslim	2.2	0.7	0.0	2.9	757
Other	3.2	2.9	0.2	5.9	542
None	(9.9)	(0.5)	(0.0)	(10.3)	49

Table 16.3.A Prevalence of recent intimate partner violence (continued)

Characteristic	Physical violence	Sexual violence	Physical and sexual violence	Physical or sexual violence[2]	Number of ever-married or partnered women
Ethnicity					
Chewa	2.8	1.1	0.2	3.8	2,421
Lomwe	3.4	1.1	0.3	4.2	1,579
Ngoni	2.7	1.9	0.2	4.4	943
Nkhonde	3.1	1.1	0.0	4.2	68
Sena	5.6	2.8	1.4	7.0	297
Tonga	2.8	1.2	0.0	4.0	125
Tumbuka	2.6	1.9	0.1	4.4	720
Yao	3.2	0.5	0.0	3.7	842
Other	3.1	1.6	0.7	4.0	432
Age					
15-19	1.8	4.1	0.2	5.6	323
20-24	3.8	1.3	0.3	4.8	1,519
25-29	5.4	1.5	0.6	6.3	1,424
30-34	4.2	1.1	0.0	5.2	1,329
35-39	3.2	1.0	0.3	3.9	946
40-44	1.4	0.9	0.2	2.2	626
45-49	1.3	1.4	0.0	2.7	454
50-54	1.0	0.2	0.0	1.2	375
55-59	0.1	0.5	0.0	0.6	257
60-64	0.0	0.0	0.0	0.0	184
Total 15-24	3.3	2.0	0.3	5.0	1,842
Total 15-49	3.5	1.4	0.3	4.6	6,621
Total 15-64	3.1	1.3	0.2	4.1	7,437

[1]Based on the following variables and questionnaire wording:
frcsx12mopt: "In the past 12 months, did a partner physically force you to have sex?"
prssx12mopt: "In the past 12 months, did a partner pressure you to have sex and did succeed?"
vlnc12moptnr: "In the past 12 months, did a partner do any of these things to you?
-Punched, kicked, whipped, or beat you with an object
-Slapped you, threw something at you that could hurt you, pushed you or shoved you
-Choked smothered, tried to drown you, or burned you intentionally
-Used or threatened you with a knife, gun or other weapon?"

All questions include the definition "By partner, I mean a live-in partner, whether or not you were married at the time."

Women who did not answer vlnc12moptnr because they were never a victim of physical violence (vlnc = 0) nor a victim of violence in the past 12 months (vlnc12motimes = 0) are included as not having experienced physical violence from a partner in the past 12 months.

Women who did not answer frcsx12mopt and/or prssx12mopt because they were never forced or pressured to have sex (frcsxtimes = 0, prssxtimes = 0) and/or were never forced or pressured to have sex in the past 12 months (prssx12mo = 2, frcsx12mo=2) are included as not having experienced sexual violence from a partner in the past 12 months.

[2]Relates to Global AIDS Monitoring indicator 4.3: Prevalence of recent intimate partner violence.
The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.
Estimates in parentheses are based on a small number (25 to 49) of unweighted cases and should be interpreted with caution.
An asterisk indicates that an estimate is based on a very small number (less than 25) of unweighted cases and has been suppressed.[3]Church of Central Africa Presbyterian.

16.4 Gaps and Unmet Needs

- While IPV is likely under-reported in face-to-face interviews, 5% of women ages 15-24 years (5.6% of those ages 15-19 years and 4.8% of those ages 20-24 years) reported experiencing physical or sexual violence by a live-in partner in the last 12 months. Violence prevention interventions should target partners of young women while social support services should target the affected women themselves.

16.5 References

1. Breiding M.J., Basile K.C., Smith S.G., Black M.C., Mahendra R.R. (2015) *Intimate Partner Violence Surveillance: Uniform Definitions and Recommended Data Elements, Version 2.0*. Atlanta, Georgia: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention.

2. Maman, S., Campbell, J., Sweat, M.D., Gielen, A.C. (2000). The intersections of HIV and violence: directions for future research and interventions. *Social Science & Medicine* 50(4), 459-478.

17 Discriminatory Attitudes Towards People Living with HIV

17.1 Key Findings

- Among adults ages 15-64 years who had ever heard of HIV, 11% reported discriminatory attitudes towards PLHIV.
- More adults ages 15-64 years in rural areas (11.9%) reported discriminatory attitudes towards PLHIV, compared to those in urban areas (7.1%).
- The largest variation in discriminatory attitudes occurs across different levels of educational attainment; 18.9% of those with no education reported discriminatory attitudes in contrast to 4.4% among those with more than secondary education.

17.2 Background

Attitudes toward and perceptions of PLHIV play an important role in the HIV epidemic. Misconceptions about HIV have resulted in people developing various false beliefs. A few examples include: HIV/AIDS always entails death, HIV is associated with depraved and immoral behaviors, HIV infection results from irresponsibility, and HIV is only spread through sex. Fears arising from these beliefs can lead to marginalization of certain populations, rendering them more vulnerable to HIV. Furthermore, HIV/AIDS discrimination continues to act as a barrier to prevention and treatment, undermining programmatic attempts to help people with HIV/AIDS, and may even result in the denial of health services.[1]

This chapter focuses on potential stigmatization directed against HIV and PLHIV. In MPHIA, the assessment of discriminatory attitudes towards PLHIV follows the guidance for global AIDS monitoring by UNAIDS and is based on two questions: 1) Would you buy fresh vegetables from a shopkeeper or vendor if you knew that this person had HIV, and 2) Do you think that children living with HIV should be able to attend school with children who are HIV negative. Responses of "no" would indicate a discriminatory attitude (UNAIDS 2016). This data can help to explain how HIV-related stigma may negatively impact efforts aimed at HIV prevention, HIV testing, and access to HIV treatment and care.

17.3 Discriminatory Attitudes Towards People Living with HIV

Eleven percent (11.0%) of adults ages 15-64 years who had ever heard of HIV reported discriminatory attitudes towards PLHIV (responded "no" to either of the two questions used to assess discriminatory attitudes). There were slight variations in discriminatory attitudes based on geographic area, marital status, socioeconomic status, age, and ethnicity. An estimated 7.1% of adults ages 15-64 years in urban areas reported discriminatory attitudes towards PLHIV compared to 11.9% of adults in rural areas. The lowest proportions of persons who reported discriminatory attitudes toward PLHIV were in Blantyre City (6.0%), Lilongwe City (7.1%) and South West (8.3%) compared to higher proportions in the North (13.3%) and Central West (13.4%). The largest variation in discriminatory attitudes occurred across different levels of educational attainment; 18.9% of those with no education reported discriminatory attitudes in contrast to 4.4% among those with more than secondary education. Similarly, 15.2% of those in the lowest wealth quintile reported discriminatory attitudes compared to 7.2% among those in the highest wealth quintile. Individuals ages 15-19 years and ages 60-64 years had the highest

percentages of persons who reported discriminatory attitudes (16.4% and 13.4%, respectively). Among those ages 20-59 years, the proportion of persons who reported discriminatory attitudes ranged from 7.9% to 10.7% (Table 17.3.A).

Table 17.3.A Discriminatory attitudes toward people living with HIV

Among persons ages 15-64 years who have heard of HIV, percentage who reported discriminatory attitudes towards PLHIV, by selected demographic characteristics, MPHIA 2015-2016

Characteristic	Would you buy fresh vegetables from a shopkeeper or vendor if you knew that this person had HIV?	Do you think that children living with HIV should be able to attend school with children who are HIV negative?	Both questions	
	Percentage who responded "No"	Percentage who responded "No"	Percentage who responded "No" to either of the two questions[1]	Number[2]
Residence				
Urban	5.1	3.9	7.1	3,697
Rural	7.9	8.2	11.9	6,044
Zone				
North	8.2	9.0	13.3	1,240
Central-East	7.8	9.0	11.8	1,372
Central-West	8.9	9.1	13.4	1,125
Lilongwe City	4.7	4.1	7.1	1,699
South-East	8.8	6.8	11.5	1,167
South-West	5.2	5.3	8.3	1,567
Blantyre City	4.0	3.8	6.0	1,571
Marital status				
Never married	10.2	9.7	14.5	2,646
Married or living together	5.7	6.3	9.1	5,985
Divorced or separated	9.0	6.3	11.9	795
Widowed	8.6	8.7	13.2	305
Education				
No education	14.1	11.9	18.9	793
Primary	8.4	8.3	12.4	5,562
Secondary	2.9	3.6	5.4	2,881
More than secondary	2.1	3.3	4.4	500
Wealth quintile				
Lowest	11.4	10.0	15.2	1,112
Second	8.3	9.8	13.3	1,384
Middle	7.5	7.5	11.4	1,560
Fourth	6.1	6.5	10.0	2,015
Highest	5.1	4.4	7.2	3,670
Religion				
Catholic	7.3	8.3	11.1	1,895
CCAP[3]	5.8	5.3	8.8	1,870
Anglican	9.3	8.1	11.6	238
Seventh Day Adventist	6.4	5.5	9.0	669
Baptist	9.6	6.4	13.7	235
Other Christian	6.5	6.8	10.5	3,059
Muslim	10.9	9.5	14.7	904
Other	9.8	10.0	13.8	702
None	2.5	7.4	7.5	156

Table 17.3.A Discriminatory attitudes toward people living with HIV (continued)

Characteristic	Would you buy fresh vegetables from a shopkeeper or vendor if you knew that this person had HIV?	Do you think that children living with HIV should be able to attend school with children who are HIV negative?	Both questions	
	Percentage who responded "No"	Percentage who responded "No"	Percentage who responded "No" to either of the two questions[1]	Number[2]
Ethnicity				
Chewa	8.3	8.4	12.0	3,188
Lomwe	4.4	3.9	6.5	1,955
Ngoni	5.1	6.3	8.5	1,225
Nkhonde	7.1	8.0	10.3	104
Sena	7.5	7.8	11.9	400
Tonga	7.2	11.4	14.7	188
Tumbuka	7.1	7.3	11.5	1,056
Yao	11.2	8.5	15.2	1,070
Other	6.4	9.6	11.8	539
Age				
15-19	12.4	10.3	16.4	1,780
20-24	6.9	7.2	10.5	1,791
25-29	4.4	5.7	7.9	1,427
30-34	5.1	6.8	9.2	1,322
35-39	4.9	6.2	8.4	1,047
40-44	7.0	6.3	10.7	759
45-49	8.0	6.3	10.1	542
50-54	5.7	4.9	8.4	448
55-59	6.7	7.1	10.1	353
60-64	7.7	9.0	13.4	272
Total 15-24	9.9	8.9	13.7	3,571
Total 15-49	7.4	7.4	11.1	8,668
Total 15-64	7.3	7.3	11.0	9,741

[1]Relates to Global AIDS Monitoring indicator 4.1: Discriminatory attitudes towards people living with HIV.
[2]IIncludes only participants who answered both questions.
[3]Church of Central Africa Presbyterian.
The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

17.4 Gaps and Unmet Needs

- Discriminatory attitudes were more common among young adults ages 15-19 years. Interventions to reduce discrimination should target venues where these young people are found, including schools and youth groups.
- Discriminatory attitudes towards PLHIV were somewhat more common in the North and Central West Zones. Education and community interventions to decrease stigma could improve the lives of PLHIV in these areas.

17.5 References

1. Joint United Nations Programme on HIV/AIDS (UNAIDS) (2016). *Global AIDS Monitoring 2017. Indicators for monitoring the 2016 United Nations Political Declaration on HIV and AIDS*. Geneva, Switzerland: UNAIDS.

18 Tuberculosis, Sexually transmitted infection Symptoms, and Cervical Cancer Screening

18.1 Key Findings

- Among self-reported HIV-positive persons ages 15-64 years, 28.0% were screened for TB symptoms (cough, fever, night sweats, and weight loss) during their last HIV clinic visit.
- Among adults ages 15-64 years who ever visited a TB clinic, 48% were tested for HIV during this visit.
- Among HIV-positive males ages 15-64 years, 16.2% reported to have had a genital ulcer, 5.0% to have had abnormal discharge from the penis, and 5.8% to have been diagnosed with an STI in the 12 months preceding the survey.
- Among HIV-positive females ages 15-64 years, 12.1% reported to have had a genital ulcer, 10.9% to have had abnormal discharge from the vagina, and 6.7% to have been diagnosed with an STI in the 12 months preceding the survey.
- Among HIV positive women ages 30-49 years, 18.7% reported ever having been screened for cervical cancer.

18.2 Background

Persons living with HIV are at risk for acquiring other diseases, including TB, hepatitis B, syphilis, and other STIs. Tuberculosis is one of the leading causes of death for PLHIV. A UNAIDS model estimates there were 6,000 [95% CI: 3,200, 9,700] TB-related deaths among HIV-positive persons in Malawi in 2016.[1] This chapter describes the TB clinical care cascade for HIV-positive individuals: received care at a TB clinic, TB diagnoses among those receiving care, and treatment among those diagnosed with TB.

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.[2] The MPHIA provides population-based rates of screening not available from routine clinic data, which does not capture women not in care. This chapter presents cervical cancer screening rates by age and sociodemographic characteristics.

18.3 Tuberculosis

Forty-eight percent (48%) of adults ages 15-64 years who had ever visited a TB clinic reported being tested for HIV during the visit, with similar distribution in testing coverage in women and men. Among adults ages 15-64 years who attended a TB clinic, 9.1% already knew that they were HIV positive and were not tested, and 42.9% were not tested for HIV although they did not know their status (Table 18.3.A).

Among self-reported HIV-positive persons ages 15-64 years, 22.5% reported ever visiting a TB clinic (25.8% of HIV-positive men compared to 20.7% of HIV-positive women). Among those who ever visited a TB clinic, 47.2% were diagnosed with TB. Among those diagnosed with TB, 98% of males and 100% of females reported receiving TB treatment (Table 18.3.B).

Among self-reported HIV-positive persons ages 15-64 years, 28.0% reported having been screened for TB symptoms (cough, fever, night sweats, and weight loss) during their last HIV clinic visit. The percentage who reported having been screened was similar between men and women (28.7% and 27.6%, respectively) (Table 18.3.C).

Table 18.3.A HIV testing in tuberculosis clinics

Percent distribution of persons ages 15-64 years who had ever visited a TB clinic by whether they were tested for HIV during a TB clinic visit, by sex, MPHIA 2015-2016

Characteristic	Tested for HIV during a TB clinic visit	Not Tested For HIV during a TB clinic visit		Total	Number
		Already knew they were HIV positive	Did not know their status		
Sex					
Male	49.0	8.4	42.6	100.0	442
Female	47.3	9.6	43.1	100.0	677
Total 15-64	48.0	9.1	42.9	100.0	1,119

Table 18.3.B Tuberculosis clinic attendance and services among HIV-positive adults

Among self-reported HIV-positive persons ages 15-64 years, percentage who ever visited a TB clinic; among those who had ever visited a TB clinic, percentage who were diagnosed for TB; and among those diagnosed with TB, percentage who were treated for TB, by sex, MPHIA 2015-2016

Characteristic	Among HIV-positive persons		Among HIV-positive persons who ever visited a TB clinic		Among HIV-positive persons who were diagnosed with TB	
	Percentage who ever visited a TB clinic	Number	Percentage who were diagnosed with TB	Number	Percentage who were treated for TB	Number
Sex						
Male	25.8	510	45.7	155	98.0	77
Female	20.7	1,220	48.2	282	100.0	143
Total 15-64	22.5	1,730	47.2	437	99.2	220

Table 18.3.C Tuberculosis symptom screening in HIV clinics

Among self-reported HIV-positive persons in HIV care ages 15-64 years, percentage who were screened for TB symptoms during their last HIV clinic visit, by sex, MPHIA 2015-2016

Characteristic	Percentage who were screened for TB symptoms	Number
Sex		
Male	28.7	464
Female	27.6	1,165
Total 15-64	28.0	1,629

18.4 Self-Reported Symptoms and Diagnosis of Sexually Transmitted Infection

Among males ages 15-64 years, 2.9% reported having had abnormal discharge from the penis and 6.3% having had an ulcer or sore on or near the penis in the 12 months preceding the survey, while 2.5% reported that they were diagnosed with an STI by a healthcare provider (doctor, clinical officer, or nurse) in that same period of time (Table 18.4.A).

Among HIV-positive males ages 15-64 years, 5.0% reported having had abnormal discharge from the penis and 16.2% having had an ulcer, while among HIV-negative males, 3.0% reported having had abnormal discharge from the penis and 5.7% reported having had an ulcer. An STI diagnosis in the 12 months preceding the survey was reported by 5.8% of HIV-positive males in contrast to 2.3% of HIV-negative males (Table 18.4.A).

The percentage of males reporting abnormal discharge from the penis or ulcerative symptoms tended to decrease with educational level with 3.9% and 8.2% of those with no education reporting these symptoms, respectively, and 1.9% reporting abnormal discharge from the penis and 5.3% reporting ulcerative symptoms among those with more than secondary education. In contrast, the diagnosis of an STI in the 12 months preceding the survey was reported more frequently by those with more than secondary education (4.9%) than by those with lower educational attainment (2.3% among those with primary education and 2.4% among those with no education and among those with secondary education). Abnormal discharge from the penis was reported with the highest frequency among males ages 15-19 years (5.0%) and with the lowest frequency among those ages 60-64 years (0.1%). Ulcerative symptoms were reported with the highest frequency among males ages 30-34 years (9.3%) and with the lowest frequency among those ages 60-64 years (4.1%) (Table 18.4.A).

Among females ages 15-64 years, 8.9% reported having had abnormal vaginal discharge and 6.8% having had an ulcer or sore on or near the vagina in the 12 months preceding the survey. Among females in this age group, 2.5% reported that they were diagnosed with an STI by a healthcare provider (doctor, clinical officer, or nurse) in that same time period (Table 18.4.B).

Among HIV-positive females ages 15-64 years, 10.9% reported having had abnormal vaginal discharge and 12.1% having had an ulcer, while among HIV-negative females, 9.1% reported having had abnormal vaginal discharge and 6.4% reported having had an ulcer in the 12 months preceding the survey. An STI diagnosis in the 12 months preceding the survey was reported by 6.7% of HIV-positive females and 1.9% of HIV-negative females (Table 18.4.B).

Abnormal vaginal discharge was reported with the highest frequency among females ages 30-34 years (11.9%) and with the lowest frequency among those ages 55-59 years (4.0%). Ulcerative symptoms were reported with the highest frequency among females ages 25-29 years (8.7%) and with the lowest frequency among those ages 60-64 years (2.5%) (Table 18.6.B).

Although a higher percentage of females than males reported having had abnormal genital discharge (8.9% versus 2.9%, respectively), similar percentages of females and males reported having had genital ulcers (6.8% and 6.3%, respectively) and diagnosis of an STI (2.5% for both males and females) in the 12 months preceding the survey (Tables 18.4.A and 18.4.B).

Table 18.4.A Other sexually transmitted infections: Males

Among males ages 15-64 years, percentage who self-reported symptoms of a sexually transmitted infection and percentage who reported clinical diagnosis of a sexually transmitted infection in the 12 months preceding the survey; by HIV status and selected demographic characteristics, MPHIA 2015-2016

Characteristic	Self-reported symptoms in the past 12 months			Percentage who were diagnosed with an STI in the past 12 months by a doctor, clinical officer, or nurse	Number
	Percentage who had abnormal discharge from the penis[1]	Percentage who had an ulcer or sore on or near the penis	Number		
Result of PHIA survey HIV test					
HIV positive	5.0	16.2	653	5.8	676
HIV negative	3.0	5.7	5,503	2.3	5,610
Not tested	1.2	4.1	909	1.6	923
Residence					
Urban	3.5	5.1	2,710	3.4	2,755
Rural	2.8	6.7	4,355	2.2	4,454
Zone					
North	3.8	5.8	913	2.7	931
Central-East	2.1	5.3	1,072	1.7	1,099
Central-West	2.7	6.7	826	1.8	844
Lilongwe City	4.0	6.2	1,256	3.8	1,282
South-East	2.4	8.3	790	2.6	807
South-West	3.2	5.9	1,050	3.0	1,074
Blantyre City	3.4	5.0	1,158	3.3	1,172
Marital status					
Never married	4.4	4.8	2,121	1.8	2,135
Married or living together	2.0	6.9	4,566	2.7	4,672
Divorced or separated	7.8	7.3	317	3.8	338
Widowed	0.9	13.9	52	4.3	55
Education					
No education	3.9	8.2	353	2.4	375
Primary	3.2	6.7	3,787	2.3	3,868
Secondary	2.5	5.5	2,436	2.4	2,467
More than secondary	1.9	5.3	488	4.9	498
Wealth quintile					
Lowest	2.6	7.9	757	1.7	779
Second	2.7	6.0	1,032	2.4	1,051
Middle	3.8	6.7	1,109	2.9	1,137
Fourth	2.6	6.5	1,490	2.5	1,525
Highest	3.0	5.3	2,677	2.6	2,717
Religion					
Catholic	3.0	6.2	1,389	2.4	1,414
CCAP[2]	3.5	5.7	1,390	2.4	1,412
Anglican	2.3	8.8	180	2.3	181
Seventh Day Adventist	2.1	6.6	464	3.0	476
Baptist	4.9	9.7	176	5.8	180
Other Christian	3.0	6.3	2,045	2.4	2,097
Muslim	1.6	5.8	644	1.8	652
Other	4.5	6.2	541	2.5	559
None	0.8	7.9	222	3.6	223
Ethnicity					
Chewa	2.8	6.4	2,383	2.1	2,438
Lomwe	3.3	6.0	1,385	2.8	1,412
Ngoni	3.1	6.1	875	2.6	883
Nkhonde	1.7	1.8	67	0.5	69
Sena	4.2	6.0	291	4.9	300
Tonga	1.5	7.0	125	2.4	130
Tumbuka	3.7	6.3	764	3.2	784
Yao	1.8	7.7	764	2.1	777
Other	3.2	5.1	403	2.1	408

Table 18.4.A Other sexually transmitted infections: Males (continued)

Characteristic	Self-reported symptoms in the past 12 months			Percentage who were diagnosed with an STI in the past 12 months by a doctor, clinical officer, or nurse	Number
	Percentage who had abnormal discharge from the penis[1]	Percentage who had an ulcer or sore on or near the penis	Number		
Age					
15-19	5.0	4.8	989	0.4	1,000
20-24	2.9	5.2	1,199	2.3	1,232
25-29	3.3	6.0	1,048	2.3	1,071
30-34	3.6	9.3	953	4.5	977
35-39	2.5	8.7	826	5.0	843
40-44	2.3	6.1	648	2.2	662
45-49	1.7	6.4	463	3.2	473
50-54	1.2	4.2	368	0.8	370
55-59	0.3	5.9	310	0.8	320
60-64	0.1	4.1	261	0.1	261
Total 15-24	3.8	5.1	2,188	1.5	2,232
Total 15-49	3.2	6.5	6,126	2.7	6,258
Total 15-64	2.9	6.3	7,065	2.5	7,209

[1]Relates to Global AIDS Monitoring indicator 10.4: Men with urethral discharge.

[2]Church of Central Africa Presbyterian.

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

Table 18.4.B Other sexually transmitted infections: Females

Among females ages 15-64 years, percentage who self-reported symptoms of an STI and percentage who reported clinical diagnosis of an STI in the 12 months preceding the survey; by HIV status and selected demographic characteristics, MPHIA 2015-16

Characteristic	Self-reported symptoms in the past 12 months			Percentage who were diagnosed with an STI in the past 12 months by a doctor, clinical officer, or nurse	Number
	Percentage who had abnormal discharge from the vagina	Percentage who had an ulcer or sore on or near the vagina	Number		
Result of PHIA survey HIV test					
HIV positive	10.9	12.1	1,457	6.7	1,457
HIV negative	9.1	6.4	7,472	1.9	7,514
Not tested	6.1	4.2	1,202	2.4	1,211
Residence					
Urban	9.0	7.1	3,767	4.0	3,794
Rural	8.9	6.8	6,364	2.2	6,388
Zone					
North	7.9	5.4	1,261	3.0	1,268
Central-East	9.4	6.9	1,299	2.1	1,307
Central-West	8.0	5.4	1,180	1.0	1,185
Lilongwe City	9.9	6.2	1,731	3.5	1,740
South-East	9.6	8.7	1,334	2.4	1,334
South-West	9.2	7.4	1,719	3.8	1,723
Blantyre City	8.9	7.4	1,607	3.1	1,625
Marital status					
Never married	8.9	6.6	1,325	2.0	1,352
Married or living together	9.0	6.9	7,010	2.7	7,030
Divorced or separated	10.6	7.9	1,237	3.0	1,242
Widowed	3.7	4.1	548	0.9	547
Education					
No education	6.9	5.7	1,150	1.8	1,153
Primary	9.5	6.8	6,079	2.7	6,104
Secondary	8.9	7.8	2,495	2.6	2,517
More than secondary	7.1	6.8	400	2.4	401
Wealth quintile					
Lowest	8.9	5.9	1,295	2.4	1,299
Second	9.9	7.7	1,476	2.4	1,483
Middle	8.5	6.8	1,647	2.3	1,650
Fourth	9.1	6.9	2,011	2.5	2,023
Highest	8.4	6.8	3,702	3.0	3,727
Religion					
Catholic	9.5	7.0	1,879	2.6	1,888
CCAP[1]	7.5	5.5	1,878	1.8	1,886
Anglican	8.6	7.4	235	1.2	238
Seventh Day Adventist	8.7	6.1	736	3.2	742
Baptist	9.7	9.4	247	2.8	248
Other Christian	9.4	6.9	3,379	2.5	3,396
Muslim	8.9	8.3	994	2.9	997
Other	9.2	6.5	717	3.0	720
None	1.8	6.3	58	3.2	59
Ethnicity					
Chewa	9.8	6.4	3,209	2.0	3,221
Lomwe	9.2	8.0	2,114	2.9	2,125
Ngoni	7.3	7.1	1,288	2.4	1,295
Nkhonde	3.2	2.1	101	1.9	102
Sena	9.4	6.7	412	3.6	414
Tonga	8.3	6.4	205	1.0	206
Tumbuka	8.2	5.3	1,063	3.1	1,071
Yao	7.8	7.6	1,153	2.9	1,156
Other	10.7	7.1	566	2.6	572

Table 18.4.B Other sexually transmitted infections: Females (continued)

Characteristic	Self-reported symptoms in the past 12 months			Percentage who were diagnosed with an STI in the past 12 months by a doctor, clinical officer, or nurse	Number
	Percentage who had abnormal discharge from the vagina	Percentage who had an ulcer or sore on or near the vagina	Number		
Age					
15-19	8.0	4.3	1,084	0.7	1,096
20-24	9.5	7.4	2,082	3.0	2,096
25-29	9.7	8.7	1,694	2.5	1,703
30-34	11.9	7.5	1,558	4.1	1,564
35-39	10.4	8.4	1,182	4.1	1,187
40-44	7.4	7.1	835	1.8	837
45-49	8.5	8.6	597	3.1	599
50-54	4.4	3.8	506	1.4	505
55-59	4.0	2.6	342	0.9	343
60-64	4.9	2.5	251	0.0	252
Total 15-24	8.9	6.1	3,166	2.0	3,192
Total 15-49	9.5	7.3	9,032	2.8	9,082
Total 15-64	8.9	6.8	10,131	2.5	10,182

[1]Church of Central Africa Presbyterian.
The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

18.5 Cervical Cancer Screening Among HIV-Positive Women

Among HIV-positive women ages 30-49 years, 18.7% reported that they had been screened for cervical cancer. Twice the percentage of women in urban areas (33.3%) than in rural areas (13.6%) reported having ever been screened for cervical cancer. The highest proportions of women who reported having ever been screened for cervical cancer were found in the North zone (34.9%), Lilongwe City (33.0%), and Blantyre City (30.6%), whereas the lowest proportions were found in South-East (10.7%), Central-West (12.2%), and Central-East (14.4%) zones. Screening for cervical cancer also differed by women's education and wealth quintile. Among women with more than secondary education, 48.0% had ever been screened for cervical cancer, compared to 12.7% of women with no education. Among women in the highest wealth quintile, 34.3% had ever been screened compared to only 2.4% of women in the lowest wealth quintile (Table 18.5.A).

Table 18.5.A Cervical cancer screening among women living with HIV[1]

Among HIV-positive women ages 30-49 years, percentage who reported being screened for cervical cancer, by selected demographic characteristics, MPHIA 2015-2016

Characteristic	Percentage who reported ever having had a screening test for cervical cancer[1]	Number
Residence		
Urban	33.3	446
Rural	13.6	489
Zone		
North	34.9	76
Central-East	14.4	59
Central-West	12.2	50
Lilongwe City	33.0	171
South-East	10.7	133
South-West	15.3	219
Blantyre City	30.6	227
Marital status		
Never married	(37.1)	40
Married or living together	17.6	560
Divorced or separated	17.9	190
Widowed	20.3	144
Education		
No education	12.7	127
Primary	16.0	551
Secondary	29.4	222
More than secondary	(48.0)	35
Wealth quintile		
Lowest	2.4	102
Second	13.0	114
Middle	14.2	126
Fourth	17.6	169
Highest	34.3	424
Religion		
Catholic	17.2	147
CCAP[2]	31.9	160
Anglican	*	20
Seventh Day Adventist	27.3	85
Baptist	(18.0)	31
Other Christian	18.0	323
Muslim	7.9	89
Other	15.6	75
None	*	4
Ethnicity		
Chewa	12.5	182
Lomwe	18.7	283
Ngoni	27.7	140
Nkhonde	*	9
Sena	(17.0)	44
Tonga	*	16
Tumbuka	31.8	76
Yao	9.3	114
Other	19.4	70
Age		
30-34	9.1	292
35-39	22.0	294
40-44	20.8	215
45-49	26.4	134
Total 30-49	18.7	935

[1]Relates to Global AIDS Monitoring indicator 10.10: Cervical cancer screening among women living with HIV.

[2]Church of Central Africa Presbyterian.

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

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

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

18.6 Gaps and Unmet Needs

- Among HIV-positive adults ages 15-64 years, 72% were not screened for TB symptoms during their last HIV clinic visit.
- Among adults ages 15-64 years who ever visited a TB clinic, 42.9% were not tested for HIV, although they did not know their HIV status.
- Among HIV-positive women ages 30-49 years, 81.3% reported that they had never been screened for cervical cancer (86.4% and 66.7% in rural and urban areas, respectively).

18.7 References

1. AIDSinfo. (2018, April). Retrieved from http://aidsinfo.unaids.org/

DISCUSSION AND CONCLUSIONS

- HIV continues to cause a significant burden of disease in the country with an estimated 10.6% of adults ages 15-64 years (900,000 people) living with HIV. However, there is remarkable progress toward the achievement of the UNAIDS 90-90-90 targets in adults (based on self-reported and/or detectable ARV data), with 77% of those ages 15-64 years living with HIV diagnosed, 91% of those diagnosed receiving ART, and 91% of those on ART with VLS. Diagnosis is a persistent challenge, and a critical priority is to diagnose and link to care PLHIV who are unaware of their HIV status. The achievement of these targets is essential, not only to prevent HIV-related illness and AIDS-related deaths, but also to prevent transmission and the occurrence of new HIV infections.
- MPHIA estimated that approximately 28,000 new HIV infections occur annually among adults ages 15-64 years (HIV incidence: 0.37% [95% CI: 0.20%-0.54%]). Increasing coverage of diagnosis, while sustaining high levels of treatment and VLS, are key to reduce HIV incidence. By quantifying national population-level HIV incidence and VLS for the first time in Malawi, MPHIA has contributed to the understanding of the epidemic. The MPHIA estimates of national HIV incidence were in-line with previous UNAIDS modeled estimates. The MPHIA results on VLS also validated promising facility-based data on high rates of VLS at a population level.
- The considerable variation in prevalence of HIV infection and VLS across regions and population groups highlights the need to focus interventions, and to rigorously evaluate and map their availability, accessibility, quality, and effectiveness in specific geographic areas and demographic groups. The southern region, densely populated and with high HIV prevalence, requires intensified programmatic efforts, particularly Blantyre City, where close to one-fifth of the adult population is living with HIV (HIV prevalence: 17.7%), while only 59.5% of PLHIV have VLS.
- There are disparities by sex in HIV prevalence, as well as coverage of care. The prevalence of HIV infection in the adult population ages 15-64 years is higher for females (12.5%) compared to males (8.5%). The coverage of key care interventions such as testing, diagnosis, and ART is lower for males than for females. As a consequence, the prevalence of VLS among male PLHIV ages 15-64 years (60.9%) is notably lower compared to female PLHIV of the same age group (73.1%).
- The high HIV prevalence among all five-year age groups over 40 years (12.4%-21.7%) suggests that it is important to assess and prepare to address a potential double burden of HIV and non-communicable diseases in an aging patient population. The country has initiated a response with the inclusion of guidance for the screening and treatment of hypertension in the most recent HIV services guidelines (Malawi MOH, 2016). In the near future, a comprehensive approach for the prevention and early detection of other cardiovascular, metabolic, renal, and neurological conditions is necessary.
- Among adults ages 15-64 years previously diagnosed with HIV but not on ART, the median CD4 count was 326 cells/µl and 78.7% were immunosuppressed (defined as having a CD4 count less than 500 cells/µl). This finding highlights the need to prioritize initiation of treatment among diagnosed PLHIV. Among those adults living with HIV but not previously diagnosed, 68.3% were immunosuppressed, and 17.2% were severely immunosuppressed (defined as having a CD4 count of less than 200 cells/µl). These findings provide further support to the appropriateness of the "Test and Treat" policy introduced in Malawi in 2016.

- While overall progress toward the 90-90-90 goals is strong at 77-91-91 among HIV-positive adults ages 15-64 years, additional programmatic support is needed for key groups, including men and young people. While 81.6% of adult females ages 15-64 years have ever tested for HIV and received their results, only 65.6% of adult males ages 15-64 years have ever tested for HIV. Among adult females ages 15-64 years who are living with HIV, 80.2% had been diagnosed compared to only 71.7% of their male counterparts. Improving coverage of diagnosis and linkage to care is particularly important among people ages 15-34 years. Only 53.7% of PLHIV ages 15-24 years, and 71.6% of those ages 25-34 years, currently know that they are HIV-positive. Awareness is particularly low among males compared to females.
- There are missed opportunities for HIV testing. Among adults ages 15-64 years who ever visited a TB clinic, 42.9% were not tested for HIV although they did not know their HIV status. New testing opportunities are also emerging as 76.5% of males and 68.5% of females ages 15-64 years have reported they would use an HIV self-test kit if it were available in Malawi.
- With a considerable burden of HIV among children ages 0-14 years (HIV prevalence of 1.5%) and slow progress toward the achievement of the UNAIDS 90-90-90 targets in this population (69.3% of children ages 0-14 years living with HIV diagnosed, 86.1% of those diagnosed receiving ART, and 57.9% of those on ART with VLS), Malawi would benefit from reevaluating its programmatic approach to this group. In addition to a major deficit in coverage of diagnosis, the estimates indicate limited VLS among those receiving treatment. This suggests a need to improve diagnosis, linkage to treatment, ART adherence, treatment monitoring, and the availability and use of optimal ART regimens for the pediatric population.
- Although Malawi has achieved high coverage of the key intervention to reduce vertical transmission of HIV (97.9% of HIV-positive women ages 15-49 years who gave birth during the 12 months preceding the survey reported that they received ARVs during pregnancy or labor and delivery), there is an important gap in early diagnosis of HIV infection in infants, which is essential to ensure their survival. The current programmatic target for virological testing of HIV in infants in Malawi is to test at least 85% of children born to HIV-positive women within two months of birth, and again at 12 and 24 months of age. However, MPHIA indicates that only half (49.4%) of children born to HIV-positive mothers had HIV testing performed within two months of birth, and an additional 29.3% had it performed between two and 12 months of age. Hence increasing overage of virological testing for HIV continues to be a national priority. Several system-level interventions could be useful in facilitating access to testing including adopting POC technologies and identifying additional points of entry to testing, such as immunization clinics. Furthermore, strengthening existing laboratory systems by expediting specimen transport, maximizing lab capacity/efficiency, and improving systems for timely return results back to clinics could also be useful in addressing this gap.
- The high coverage of key interventions to reduce vertical transmission of HIV is reflected in the low prevalence of HIV infection among infants born to HIV-positive women ages 15-49 years; among these infants, 1.2% of those ages 0-11 months and 3.0% of those ages 0-17 months were identified as HIV positve based on virological testing.
- Although coverage of ART is high among adults who have been diagnosed with HIV, there are deficits in other areas of HIV care. Among HIV-positive adults ages 15-64 years, 72% reported that they were not screened for TB symptoms during their last HIV clinic visit, and 81.3% of HIV-positive women ages 30-49 years reported that they had never been screened for cervical cancer (86.4% in rural areas and 66.7% in the urban ones).
- In addition to the prevalence of HIV infection among individuals in a population, an important dimension to understand the impact of HIV on the country is the prevalence of HIV- affected

households. Having one or more HIV-positive members per household has the potential to impact not only the health-status but also the psycho-social and economic well-being of other household members. The MPHIA estimated that 25% of the urban and 16.3% of the rural households in Malawi had at least one HIV-positive member and that 16.4% of the households had an HIV-positive head.

- Condom use was low among sexually active women who reported having sex with a non-marital, non-cohabiting partner in the 12 months preceding the survey, with only 45% having reported using a condom the last time they had intercourse with such a partner. Low condom use in this context was particularly pronounced among women with no education, and also in the high HIV-prevalence zones, South-East and South-West. Although the percentage using a condom with a non-marital, non-cohabiting partner was highest among women ages 15-19 years (60.4%) and ages 20-24 years (46.1%), it is important to increase uptake of condom use, in addition to other prevention interventions targeting adolescent and young women.
- Although overall condom use is low, estimates of condom use at last sexual intercourse in the 12 months preceding the survey among PLHIV suggest that the strategy of prevention with positives is generating changes in behavior. Among both males and females ages 15-64 years, condom use at last sexual intercourse was reported more frequently among people who were aware of their HIV positive status and on ART than among those who were HIV negative (34.4% versus 18.9%, respectively, among males; and 26% versus 11.1% respectively, among females).
- Among HIV positive females ages 15-64 years who were aware of their status, 31.9% reported not having sexual intercourse in the 12 months preceding the survey compared to 16.5% of those who were HIV negative.
- More than one in eight persons (13.7%) ages 15-24 years reported having sexual intercourse before the age of 15 years. Sexual debut before the age of 15 years was especially high among those with no education. Reproductive health and HIV prevention programs could focus on delaying the age of sexual debut, with a special effort to adapt strategies for those in the population with low education levels.
- Malawi should further emphasize HIV education: 53% of adolescents and young adults ages 15-24 years lack correct knowledge about HIV transmission and prevention, with 19% of males and 28% of females not knowing that the risk of sexual acquisition of HIV can be reduced by consistent condom use, and 20% believing that a person can acquire HIV from a mosquito bite.
- The implementation of VMMC has continued to scale up, with higher coverage (9.4%-12.9%) observed among the five year age bands within the target age group of 15-30 years in comparison with older age groups. However, significant further expansion of the program is necessary to reach the national target of 60% coverage of VMMC, especially in areas with high HIV prevalence.

References

Ministry of Health Malawi (2016). *2016 Clinical management of HIV in children and adults. Malawi integrated guidelines and standard operating procedures for providing HIV services*. Retrieved from Ministry of Health: https://aidsfree.usaid.gov/sites/default/files/malawi_art_2016.pdf

APPENDICES

APPENDIX A SAMPLE DESIGN AND WEIGHTING

Appendix A provides a high-level overview of sampling and weighting procedures for MPHIA 2015-2016. In-depth details are provided in the MPHIA Technical Report, which may be found on the PHIA Project website.

A.1 Sample Design

Overview

The sample design for MPHIA is a stratified multistage probability sample design, with strata defined by the seven 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 zone, the first-stage sampling units (also referred to as primary sampling units or PSUs) were selected with probabilities proportionate to the number of households in the PSU based on the 2008 Malawi Census of Population and Housing. The allocation of the sample PSUs to the seven zones was made in a manner designed to achieve specified precision levels for (1) a national estimate of the HIV incidence rate and (2) zonal estimates of VLS.

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 (i.e., equal probability) samples within each zone to the extent feasible.

Within the sampled households, all eligible adolescents and adults ages 15-64 years were included in the study sample for data collection. All eligible children ages 0-14 years, in half of the sampled households, were included in the study for data collection.

Population of Inference

The population of inference for MPHIA is comprised of the *de facto* household population. The *de facto* population is comprised of individuals who were present in households (i.e., slept in the household) on the night prior to the household interview. In contrast, the *de jure* population is comprised of individuals who are usual residents of the household, irrespective of whether or not they slept in the household on the night prior to the household interview.

Precision Specifications and Assumptions

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

- The number of first-stage sampling units (EAs) to be selected was 500, with an average of 30 occupied dwelling units per EA.
- The total sample of 15,000 occupied dwelling units were allocated to the seven strata (health zones) as follows: First, the sample size for each of the three low-prevalence zones of the country was determined so that the expected 95% confidence bounds around the estimated VLS rate among HIV-positive persons ages 15-49 years is approximately $\pm$ 8%. The balance of the sample was then allocated to the remaining four zones so that that 95% confidence bounds around the estimated VLS rate among HIV-positive persons ages 15-49 years in each zone is approximately $\pm$ 5%.

- The total sample size must also be sufficient to produce a national annual HIV incidence rate with a relative standard error (RSE) of 30% or less for persons aged 15-49. Based on the sample allocation given in (c) above, the RSE of the estimated incidence rate was expected be approximately 27%.

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

- An overall HIV prevalence rate of 0.106 (10.6%) that varies by zone.[1]
- An annual HIV incidence rate for adults aged 15-49 of $P_a = 0.0077$ (0.77%).[2]
- A mean duration of recent infections (MDRI) of 130 days, yielding an annualization rate of 365/130= 2.8077. Hence, the estimated incidence rate for MDRI = 130 days is $P_m = 0.0077/2.8077$=0.0027 (0.27%).
- A VLS rate among HIV-positive adults aged 15-49 in each zone h of P_{vh} = 50%. This conservative assumption overstates the actual variance of the VLS rate.
- An intra-cluster correlation (ICC) of = 0.05 for both prevalence and incidence. The ICC provides an average measure of the homogeneity of responses within the first-stage sampling units. This assumption is conservative.
- An occupancy rate of 92.7% for sampled dwellings. Note that this is not included in the calculation of the overall survey RR, but does determine the initial numbers of dwelling units to be sampled. A sample of 16,181 dwelling units will yield a sample of about 15,000 occupied dwelling units (households).[3]
- The average number of persons ages 15-49 years in a household is 1.89.[4]
- The percentage of persons in households who are ages 0-14 years is 49.0%.[5]
- The percentage of persons in households who are ages 50-64 years is 6.2%.[6]
- Among the individuals ages 15-64 years, an overall biomarker RR of 70%, reflecting sample loss due to any of the following reasons: nonparticipation (refusal) of some sample households, nonresponse to the individual interview, refusal to provide a blood sample, or providing a non-analyzable blood sample.
- Among the children in the eligible responding households, an overall biomarker RR of 65% for persons ages 0-14 years. This value is the comparable RR for adults minus 5%.

Selection of the Primary Sampling Units

The PSUs for MPHIA are defined to be the EAs created for the 2008 Malawi Census of Population and Housing. The sampling frame consisted of approximately 12,666 EAs containing an estimated 2,869,933 households and 13,029,498 persons.

A stratified sample of 12,666 EAs was selected from the sampling frame. The seven strata specified for sampling were the seven zones of Malawi. The EA samples were selected systematically and with probabilities proportionate to a measure of size (MOS) equal to the number of households in the EA based on the 2008 Malawi Census of Population and Housing. Prior to selection, EAs were sorted by strata. Next, within each stratum, the EAs were sorted by the unique 8-digit EA identification code. Such sorting arranges the EAs within a stratum by district (with rural districts followed by urban districts), and then by EA within district. The sorting of the EAs prior to sample selection induces an implicit geographic stratification. To select the sample from a particular stratum, the cumulative MOS was determined for each EA in the ordered list of EAs, and the sample selections were designated using a sampling interval equal to the total MOS of the EAs in the stratum divided by the number of EAs to be selected and a random starting point. The resulting sample has the property that the probability of selecting an EA within a particular stratum is proportional to the MOS of the EA in the stratum.

Details regarding EA substitution and segmentation may be found in MPHIA 2015-2016 Sampling and Weighting Technical Report.

Selection of Households

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

The selection of households for MPHIA involved the following steps: (1) listing the dwelling units/households within the sampled EAs; (2) assigning eligibility codes to the listed dwelling unit/household records; (3) selecting the samples of dwelling units/households; and (4) designating a subsample of households for data collection for children.

A description of the household listing process as well as a summary of household eligibility may be found in MPHIA 2015-2016 Sampling and Weighting Technical Report.

Selection of households utilized an equal probability design. In order to achieve equal probability samples of households within each of the seven 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 yield more or less than the desired 30 households in EAs where the sampling MOS differed from the actual listing count. The MPHIA 2015-2016 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.

Table A.1. Number of sampled dwelling units/households and expected unequal weighting design effects by stratum

Stratum (Zone)	No. sample PSUs (clusters)	Number of sampled dwelling units/house-holds	Number of dwelling units/house-holds flagged for child data collection	Minimum PSU sample size	Maximum PSU sample size	UEW DEFF for PHIA sample after capping
Northern	62	2,008	1,006	15	60	1.07
Central East	78	2,540	1,265	15	60	1.01
Central West	58	1,855	930	15	60	1.00
Lilongwe City	72	2,327	1,165	15	60	1.03
South East	84	2,736	1,373	15	60	1.01
South West	78	2,531	1,263	15	60	1.00
Blantyre City	68	2,188	1,094	15	60	1.02
Total	500	16,185	8,096	15	60	1.25*

*Reflects variation in weights within and across strata.
PSU: primary sampling unit
UEW: unequal weighting
DEFF: design effect

Reduction of the Household Sample

After the sample had been selected as described above, it was necessary to reduce the sample size in selected EAs to ensure that data collection could be completed as scheduled. The sample reductions were implemented in those EAs where data collection had not yet started as of late May 2016. These included all of the EAs in the Northern zone, and a subset of EAs in the Central East and South East zones. To achieve the required reductions, 80 percent of original samples were retained in the EAs in the Northern zone, while 55 percent were retained in the not-yet-started EAs of the Central East zone, and 40 percent were retained in the not-yet-started EAs of the South East zone. The subsamples were selected systematically and with equal probability from ordered lists of the originally-sampled dwelling units/households, where the ordering was by stratum, EA, and the child sample flag within EA. Table A.2 summarizes the number of EAs subject to subsampling, the number of originally-selected dwelling units/households in these EAs, and the number retained for data collection. Table A.3 summarizes the number of dwelling units/households in the final reduced sample, the number designated for child data collection, and the minimum and maximum EA sample size by stratum. The last column of the table shows the unequal weighting (UEW) design effects to be expected for the reduced sample. The relatively large design effects for the Central East and South East zones primarily reflect the variation in weights resulting from the subsampling of dwelling units/households in the not-yet-started EAs. The design effect for the Northern zone was not changed by the sample reduction since all EAs in the zone were equally affected.

Table A.2 Original and reduced sample sizes in the primary sampling units where data collection had not yet started

Stratum (Zone)	Total number of PSUs (clusters)in sample	Number of EAs subject to subsampling	Number of dwelling units/house-holds in original sample	Proportion of dwelling units/house-holds to be retained	Reduced sample size
Northern	62	62	2,008	0.80	1,602
Central East	78	48	1,562	0.55	861
South East	84	41	1,351	0.40	541
TOTAL	224	151	4,921	-	3,004

EA: enumeration area

Table A.3 Number of sampled dwelling units/households in final reduced sample, and expected unequal weighting design effects by stratum

Stratum (Zone)	No. sample PSUs	Number of sampled dwelling units/house-holds	Number of dwelling units/house-holds flagged for child data collection	Minimum PSU sample size	Maximum PSU sample size	UEW DEFF for the reduced sample
Northern	62	1,602	803	13	48	1.07
Central East	78	1,839	916	8	60	1.11
Central West	58	1,855	930	15	60	1.00
Lilongwe City	72	2,327	1,165	15	60	1.03
South East	84	1,926	964	6	60	1.23
South West	78	2,531	1,263	15	60	1.00
Blantyre City	68	2,188	1,094	15	60	1.02
Total	500	14,268	7,135	6	60	1.35*

*Reflects variation in weights within and across strata.
PSU: primary sampling unit
UEW: unequal weighting
DEFF: design effect

Selection of Individuals

The selection of individuals for MPHIA involved the following steps: (1) compiling a list of all individuals known to reside in the household or who slept in the household during the night prior to data collection; (2) identifying those rostered individuals who are eligible for data collection; and (3) selecting for the study those individuals meeting the age and residency requirements of the study. However, only those individuals who slept in the household the night before the household interview (i.e., the *de facto* population) were retained for subsequent weighting and analysis.

The MPHIA 2015-2016 Sampling and Weighting Technical Report provides a brief description of the process for listing and selecting individuals for participation in MPHIA, and also presents detailed summaries of the distributions of eligible individuals and participants in individual interviews and HIV testing by strata and age.

A.2 Weighting

Overview

In general, the purpose of weighting survey data from a complex sample design is to (1) compensate for variable probabilities of selection, (2) account for differential nonresponse rates within relevant subsets of the sample, and (3) adjust for possible under-coverage of certain population groups. Weighting is accomplished by assigning an appropriate sampling weight to each responding sampled unit (e.g., a household or person), and using that weight to calculate weighted estimates from the sample. The critical component of the sampling weight is the base weight that 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 non-coverage in the sample. When nonresponse or non-coverage 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, nonresponse could occur at different stages of data collection, for example, (1) before the enumeration of individuals in the household, (2) after household enumeration and selection of persons, but before completion of the individual interview, and (3) after completion of the interview, but before collection of a viable blood sample.

Non-coverage arises when some members of the survey population have no chance for selection for the sample. For example, non-coverage 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 are used to calibrate the weighted sample counts to available population projections.

Methods

The overall weighting approach for MPHIA includes several steps. Methods and results for each of the steps below are detailed in MPHIA 2015-2016 Sampling and Weighting Technical Report.

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

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

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

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

- **Calculation of person-level interview weights**: Once the household weights are determined, they are used to calculate the individual base weights. The individual base weights are then adjusted for nonresponse among the eligible individuals, with a final adjustment for the individual weights to compensate for under-coverage in the sampling process by post-stratifying (i.e., weighting up) to 2016 population projections.

- **Calculation of person-level HIV testing weights**: The individual weights adjusted for nonresponse are 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 are applied to the full sample and the replicate samples so that the final set of full sample and replicate weights can be used for variance estimation that takes into account the complex sample design and every step of the weighting process.

A.3 References

1. National Statistical Office (2010). *Malawi Demographic and Household Survey (DHS)*. Retrieved from http://www.mw.one.un.org/wp-content/uploads/2014/04/Malawi-Demographic-and-Health-Survey-2010-Final-Report.pdf

2. AIDSinfo. (2018, April). Retrieved from http://aidsinfo.unaids.org/

3. National Statistical Office (2010). *Malawi Demographic and Household Survey (DHS)*. Retrieved from http://www.mw.one.un.org/wp-content/uploads/2014/04/Malawi-Demographic-and-Health-Survey-2010-Final-Report.pdf

4. National Statistical Office (2010). *Malawi Demographic and Household Survey (DHS)*. Retrieved from http://www.mw.one.un.org/wp-content/uploads/2014/04/Malawi-Demographic-and-Health-Survey-2010-Final-Report.pdf

5. National Statistical Office (2010). *Malawi Demographic and Household Survey (DHS)*. Retrieved from http://www.mw.one.un.org/wp-content/uploads/2014/04/Malawi-Demographic-and-Health-Survey-2010-Final-Report.pdf

6. National Statistical Office (2010). *Malawi Demographic and Household Survey (DHS)*. Retrieved from http://www.mw.one.un.org/wp-content/uploads/2014/04/Malawi-Demographic-and-Health-Survey-2010-Final-Report.pdf

APPENDIX B HIV TESTING METHODOLOGY

B.1 Specimen Collection and Handling

Blood was collected by qualified survey staff from consenting participants. Fourteen ml of venous blood were collected from persons ages 15 years and older, while six ml were collected from persons ages 2-14 years. One ml of capillary blood was collected from children ages 0-2 years using finger-stick for children ages 6-24 months and heel-stick for children less than the age of six months.

Blood samples were labeled with a unique barcoded participant ID and stored in temperature-controlled cooler boxes. At the end of each day, samples were transported to a satellite laboratory for registration in a laboratory information management system, processing into plasma, and DBS, and storage at -20°C within 24 hours of blood collection. Approximately weekly, samples were transported to COM-JHP for additional testing and long-term storage at -80°C.

B.2 Household-Based Procedures

HIV Rapid Testing

HIV rapid testing was conducted in each household in accordance with Malawi's national guidelines (Figure B.2.A). HIV-positive and HIV-indeterminate samples underwent additional testing at a satellite laboratory, as described in Section B.3. For participants who self-reported an HIV-positive status, but tested HIV negative during the survey, additional testing was conducted at COM-JHP, as described in Section B.3. For children younger than the age of 18 months, only the initial rapid test was performed. If the test was reactive, the sample underwent additional testing at COM-JHP, as described in Section B.3.

CD4 Testing

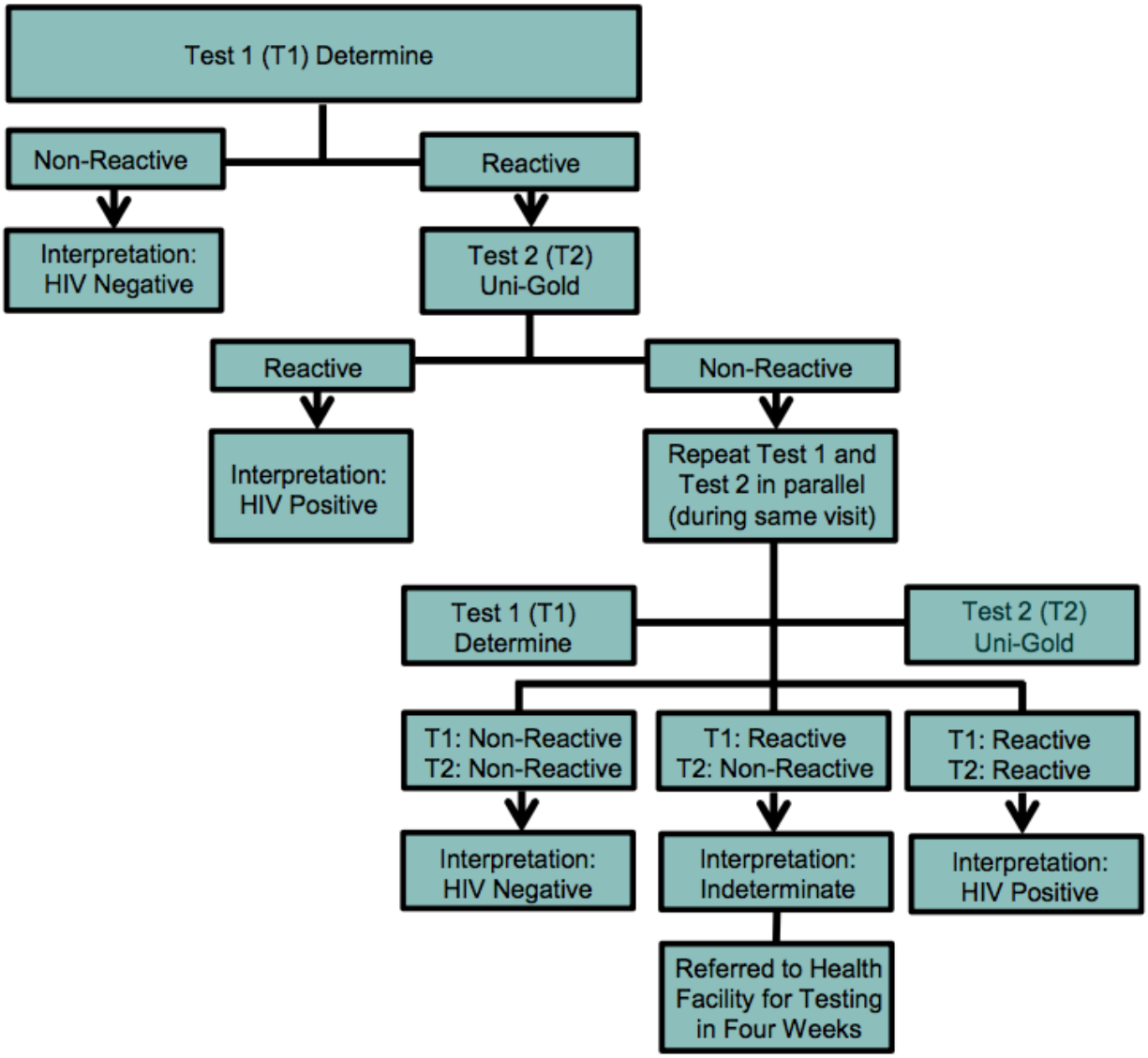
All participants who tested HIV positive and a random sample of 5% of participants who tested HIV negative received a CD4 count measurement in the field by qualified survey staff. The measurement was performed using a Pima™ Analyzer and Pima™ CD4 Cartridge (Abbott Molecular Inc., Chicago, Illinois, United States, formerly Alere).

Counseling, Referral to Care, and Active Linkage to Care

Pre- and post-test counseling were conducted in each household in accordance with Malawi's national guidelines. For participants ages 18 years and older, results were communicated directly to the participant. For participants ages 15-17 years, results were communicated to the participant and the parent/guardian together, while for participants less than the age of 15 years, results were communicated directly to the parent or guardian. All participants who consented to HIV testing were asked to share contact information and to select a referral health facility prior to testing. Participants with an HIV-positive test result were referred to HIV care and treatment at the health facility of their choice, while participants with an HIV-indeterminate test result were advised to seek repeated testing at the health facility of their choice in four to six weeks. Further, HIV-positive participants were asked to consent for contact by qualified healthcare personnel, in order to facilitate active linkage to HIV care and treatment in Malawi's healthcare system.

In rare cases where participants were provided an incorrect HIV test result, self-reported an HIV-positive status, but tested HIV negative during the survey, or required additional collection of blood to complete testing, households were revisited by qualified personnel to provide participants with correct information and guidance on appropriate actions.

Figure B.2.A Household-based HIV testing algorithm, MPHIA 2015-2016



Quality Assurance and Control

To control the quality of the performance of HIV rapid tests, field staff conducted testing of a panel of HIV-positive and HIV-negative DTS on a weekly basis. To assure the quality of the performance of field staff conducting HIV testing, proficiency testing, using a panel of blinded HIV-positive and HIV-negative dried tube specimens, was evaluated twice during the course of fieldwork. Additionally, sample re-testing was conducted at a satellite lab for (1) the first 50 samples tested by each field staff member, (2) a random sample of five percent of HIV-negative specimens, and (3) all HIV-indeterminate specimens.

A limitation of the survey is the potential limitation of rapid tests to detect HIV antibodies among people in the serological window of infection, in HIV-positive patients on ART, and in mothers of infants ages four months and older. Participants in the first two categories are not expected as a significant source of bias. Further analysis will identify how many infants born to HIV-positive women were not identified by a rapid test.

B.3 Laboratory-Based Procedures

Nine survey satellite laboratories were established in existing health facility laboratories across the country. One central laboratory was established at COM-JHP in Blantyre, Malawi.

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.3.A). Testing was conducted at COM- JHP in accordance with the manufacturer's protocol.

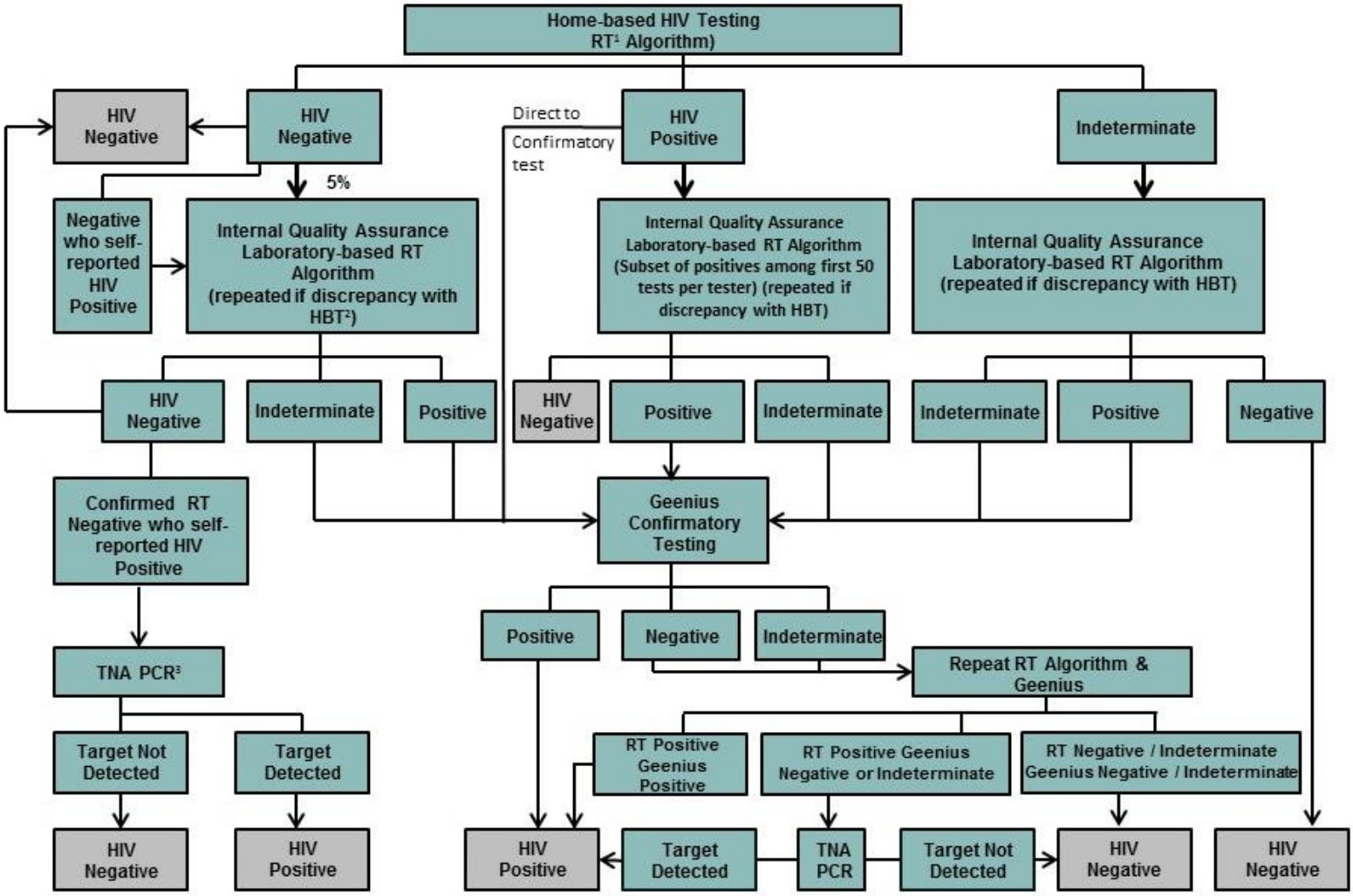
HIV TNA Polymerase Chain Reaction

For children less than age of 18 months who had a reactive HIV test result during household-based testing, HIV TNA PCR was conducted (Figure B.3.A). Additionally, HIV TNA PCR was evaluated for participants who self-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.3.B). During MPHIA, HIV TNA PCR was conducted using the Abbott Real Time HIV-1 Qualitative Assay (Abbott Molecular, Wiesbaden, Germany) on the Abbott m2000 system at COM- JHP in accordance with the manufacturer's protocol.

Classification of Final HIV Status

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

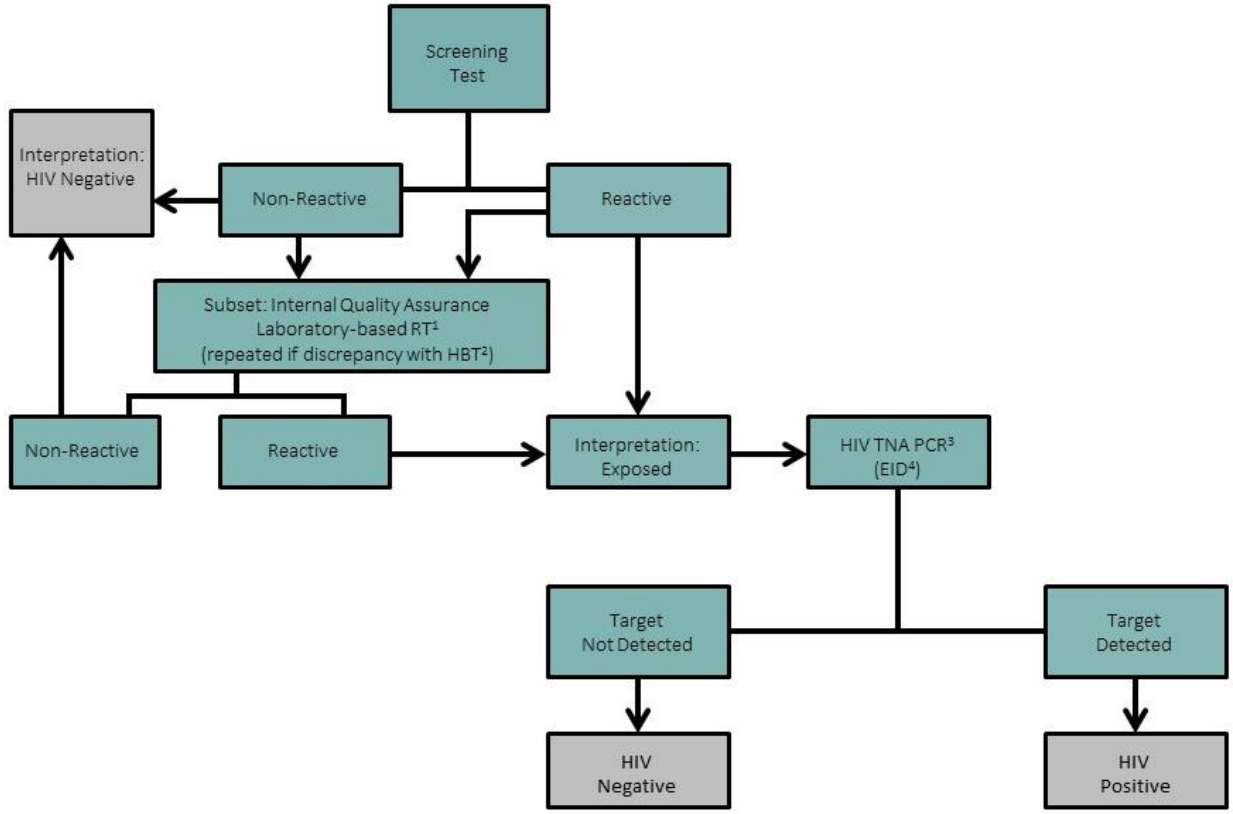
Figure B.3.A Final HIV status classification algorithm (≥18 months), MPHIA 2015-2016



[1]RT: rapid test; [2]HBT: home-based testing; [3]TNA PCR: total nucleic acid polymerase chain reaction

Note: Grey boxes indicate a final HIV-status determination

Figure B.3.B Final HIV status classification algorithm (<18 months), MPHIA 2015-2016



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

Note: Grey boxes indicate a final HIV-status determination

Viral Load Testing

The Abbott m2000sp was used to prepare plasma samples from confirmed HIV-positive participants for reverse transcription polymerase chain reaction (RT-PCR), using the Abbott m2000 System (Abbott Molecular Inc., Chicago, Illinois, United States). Next, HIV-1 VL (HIV RNA copies per ml) was measured using the Abbott m2000rt. The open-mode protocol for the Abbott RealTime HIV-1 assay was used to measure VL from DBS samples from children and from adults with insufficient volume of plasma.

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

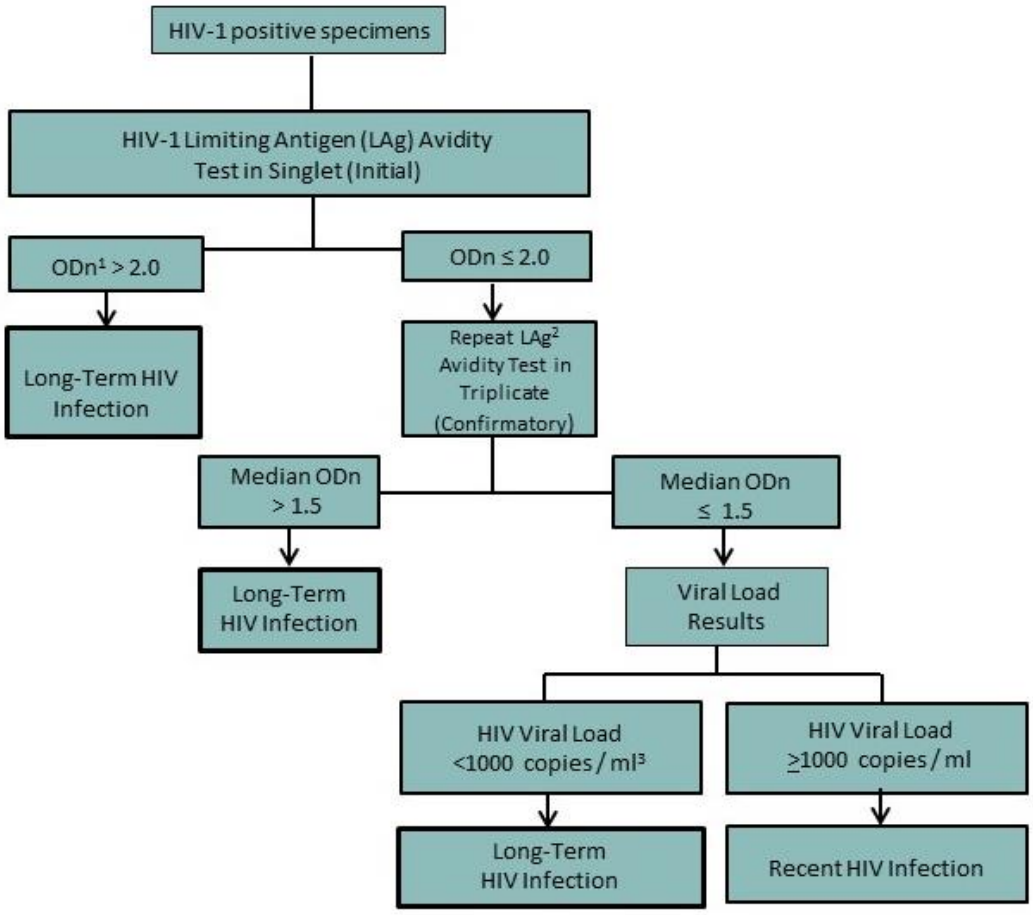
HIV Recency Testing

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

Limiting Antigen testing was performed twice, with an initial screening test followed by a confirmatory process: specimens with an $OD_n > 2.0$ during initial testing were classified as long-term infections, while those with $OD_n \leq 2.0$ underwent further testing of the specimen in triplicate. Specimens with median $OD_n > 1.5$ in confirmatory testing were classified as long-term infections. Specimens with median $OD_n < 0.4$ were retested using the HIV diagnostic testing algorithm to confirm HIV-1 seropositivity, and samples identified as HIV-1 seronegative were excluded from the total number of HIV positives and incorporated into the total number of negative specimens for incidence estimation.

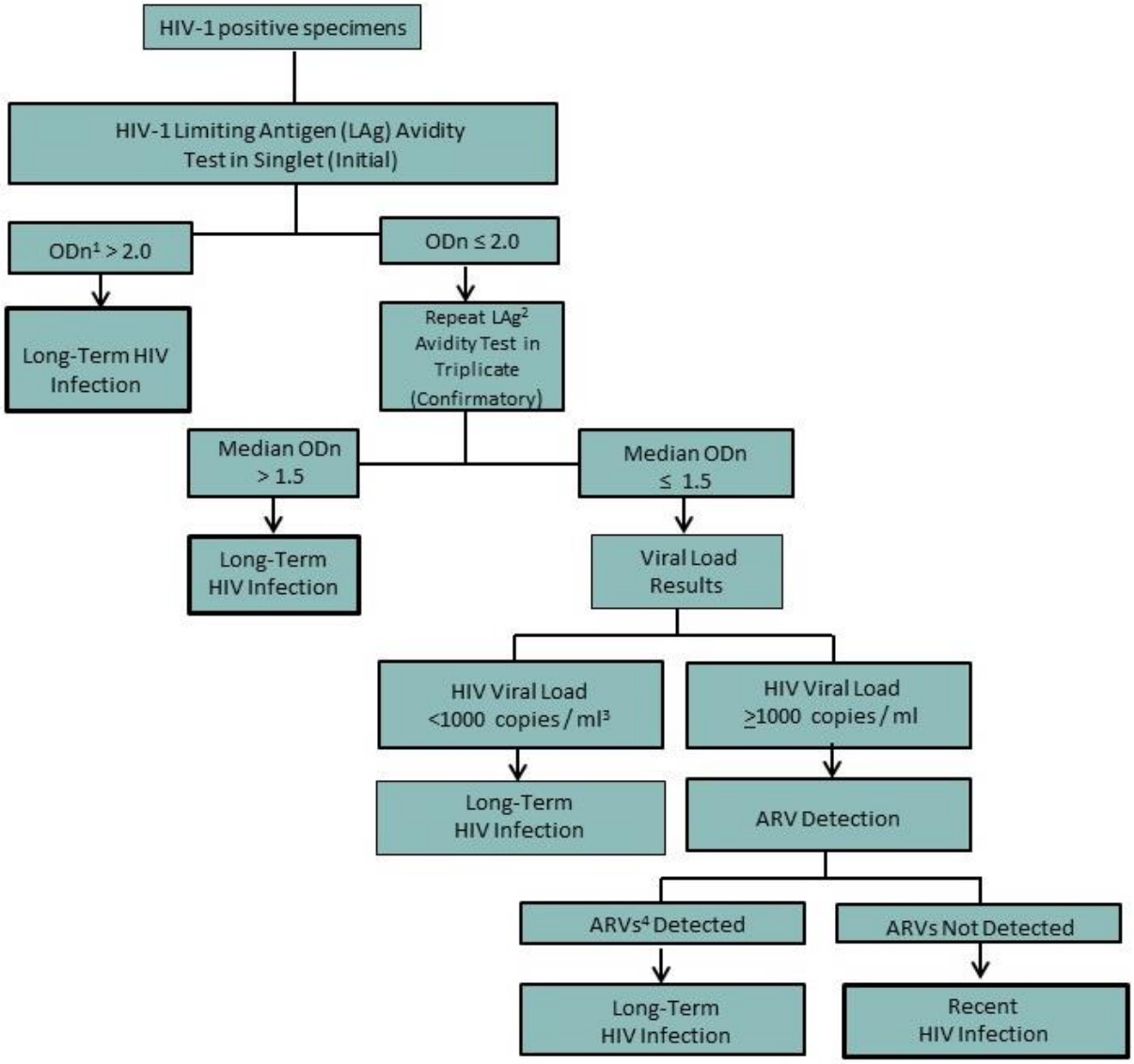
Specimens with median ODn ≤ 1.5 were classified as potential HIV-recent infections, and their viral load results were assessed. For the first incidence testing algorithm, specimens with viral load <1,000 copies/ml were classified as long-term infections, while those with viral load ≥ 1,000 copies/ml were classified as recent infections. For the updated incidence algorithm, those classified as recent infections by the first algorithm were reclassified using ARV detection data. Those specimens in which efavirenz, atazanavir, lopinavir, and nevirapine were detected were classified as long-term infections and those in which no ARVs were detected remained classified as recent infections.

Figure B.3.C HIV-1 Recent Infection Testing Algorithm (LAg/VL algorithm), MPHIA 2015-2016



[1]ODn: normalized optical density; [2]LAg: Limiting Antigen; [3]ml: milliliter

Figure B.3.D HIV-1 recent infection testing algorithm (LAg/VL/ARV algorithm), MPHIA 2015-2016



[1]ODn: normalized optical density; [2]LAg: Limiting Antigen; [3]ml: milliliter; [4]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) are provided for use in incidence calculations or UNAIDS Spectrum models (Tables B.3.A, B.3.B). Incidence estimates were calculated using the following parameters: MDRI = 130 days (95% CI: 118-142 days); PFR = 0.00; time cutoff (T) = 1 year. In-depth details are provided in the MPHIA Technical Report, which may be found online on the PHIA Project website.

Table B.3.A Annual HIV incidence auxiliary data: N, P, Q, R, (LAg/VL[1] algorithm)

Annual incidence of HIV among persons ages 15-49 years and ages 15-64 years, by sex and age, MPHIA 2015-2016

	Males				Females				Total			
Age	Number HIV negative[2] (N)	Number HIV positive[2] (P)	Number tested on LAg assay[2] (Q)	Number HIV recent[2] (R)	Number HIV negative[2] (N)	Number HIV positive[2] (P)	Number tested on LAg assay[2] (Q)	Number HIV recent[2] (R)	Number HIV negative[2] (N)	Number HIV positive[2] (P)	Number tested on LAg assay[2] (Q)	Number HIV recent[2] (R)
15-24	2637.01	40.99	39.51	0.42	3456.75	123.25	123.25	4.98	6101.09	156.91	155.22	4.92
25-34	1662.72	145.28	144.89	2.36	2484.93	451.07	451.07	7.76	4183.05	560.95	560.47	9.47
35-49	1496.07	323.93	323.93	2.64	1886.90	546.10	544.38	0.42	3393.73	859.27	857.71	3.35
15-49	5815.97	490.03	488.10	5.30	7863.99	1085.01	1083.31	12.92	13727.86	1527.14	1523.39	17.55
15-64	6595.05	612.95	610.98	6.20	8731.01	1247.99	1246.31	16.24	15370.74	1816.26	1812.49	21.59

[1] LAg/VL: limiting antigen/viral load

[2] Weighted number

Note: mean duration recent infection (MDRI) = 130 days (95% confidence interval: 118-142 days); proportion false recent (PFR) = 0.00; time cutoff (T) = 1 year

Table B.3.B Annual HIV incidence auxiliary data: N, P, Q, R (LAg/VL/ARV[1] algorithm)

Annual incidence of HIV among persons ages 15-49 and ages 15-64 years, by sex and age, using LAg/VL/ARV algorithm, by sex and age, MPHIA 2015-2016

	Males				Females				Total			
Age	Number HIV negative[2] (N)	Number HIV positive[2] (P)	Number tested on LAg assay[2] (Q)	Number HIV recent[2] (R)	Number HIV negative[2] (N)	Number HIV positive[2] (P)	Number tested on LAg assay[2] (Q)	Number HIV recent[2] (R)	Number HIV negative[2] (N)	Number HIV positive[2] (P)	Number tested on LAg assay[2] (Q)	Number HIV recent[2] (R)
15-24	2637.01	40.99	39.51	0.42	3456.75	123.25	123.25	4.68	6101.09	156.91	155.22	4.65
25-34	1662.72	145.28	144.89	2.36	2484.93	451.07	451.07	7.38	4183.05	560.95	560.47	9.15
35-49	1496.07	323.93	323.53	1.79	1886.90	546.10	544.38	0.42	3393.73	859.27	857.26	2.39
15-49	5815.97	490.03	487.74	4.52	7863.99	1085.01	1083.31	12.24	13727.86	1527.14	1522.97	16.05
15-64	6595.05	612.95	610.61	5.40	8731.01	1247.99	1246.31	15.57	15370.74	1816.26	1812.06	20.07

[1] LAg/VL/ARV: Limiting antigen/viral load/antiretroviral

[2] Weighted number

Note: mean duration recent infection (MDRI) = 130 days (95% confidence Interval : 118-142 days); proportion false recent (PFR) = 0.00; time cutoff (T) = 1 year

Detection of Antiretrovirals

To understand recent exposure to ARVs and hence level of ART coverage, samples from all confirmed HIV-positive participants were evaluated for the presence of selected ARVs, using high-resolution liquid chromatography coupled with tandem mass spectrometry to detect ARVs from DBS specimens.[1] Three ARVs, one NNRTIs, efavirenz, and two PIs) atazanavir and lopinavir, were used as markers for both first- and second-line regimens, based on the Malawi's national treatment guidelines. Samples from participants who were virally suppressed and/or self-reported on ART, but had no evidence of the first three compounds were tested for an additional NNRTI, nevirapine. The ARVs were selected based on their long half-lives, allowing for longer window period from drug exposure to detection.

To qualitatively detect ARVs, a single DBS was eluted, and chromatographic separation carried out on a Luna 5µm PFP column (110 Å, 50 x 2 mm) (Phenomonex, Torrance, California, United States). Each ARV was detected using an API 4000 LC/MS/MS instrument (Applied Biosystems, Foster City, California, United States). Internal standards and in-house QC cut-off samples, including negative controls, were utilized in each run. This qualitative method used a limit of detection of 0.02 µg/ml for each ARV, with a signal-to-noise ratio of at least 5:1 for all ARVs. Samples with concentrations above 0.02 µg/ml were considered positive for each ARV. Testing was conducted at COM-JHP in Blantyre, Malawi.

Genotyping for Detection of Antiretroviral Drug Resistance and HIV Subtyping

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

Viral RNA or TNA from plasma or DBS was extracted using the NucliSENS® easyMAG® (bioMérieux, Marcy-L'Etoile, France) platform. The HIV *pol* gene was amplified by one-step RT-PCR, which was followed by nested PCR. Sequencing of the approximately one-kilobase amplicons was performed on the ABI 3730 DNA Analyzer (Applied Biosystems).[2,3,4]

The customized ReCALL software program was used to edit raw sequences and generate consensus sequences.[5] Mutations in the protease and reverse transcriptase genes were classified as potentially associated with drug resistance, according to the Stanford University HIV Drug Resistance Database.[6] Sequences with >98% homology were flagged for potential cross-contamination or possible epidemiological links. Internal QA measures and in-house QC standards were included in each run to validate results. The assay's sensitivity was established at 1000 copies/ml for plasma and DBS.[7] Sequences were also analyzed for potential cross-contamination by phylogenetic analysis from code 6 of the protease gene to code 251 of the reverse transcriptase gene.

Subtyping of each sample was performed using the REGA HIV-1 & 2 Automated Subtyping Tool.[8,9] This BioAfrica viral subtyping tool is designed to use phylogenetic methods in order to identify the HIV-1 subtype of a specific sequence. The sequence is analyzed for recombination using boot-scanning methods.

B.4 References

1. Koal, T., et al. (2005). Quantification of antiretroviral drugs in dried blood spot samples by means of liquid chromatography/tandem mass spectrometry. *Rapid Communications in Mass Spectrometry*, 19(21), 2995-3001.

2. Ruark, A., et al. (2014). Love, lust and the emotional context of multiple and concurrent sexual partnerships among young Swazi adults. *African Journal of AIDS Research*, 13(2), 133-43.

3. Uganda Ministry of Health (2012). *Uganda AIDS Indicator Survey 2011*. Retrieved from http://health.go.ug/docs/UAIS_2011_REPORT.pdf

4. UNAIDS (2010). *UNAIDS Report on the global AIDS Epidemic 2010*. Retrieved from http://www.unaids.org/globalreport/Global_report.htm

5. Woods C., et al., (2012). Automating HIV Drug Resistance Genotyping with RECall, a Freely Accessible Sequence Analysis Tool. *Journal of Clinical Microbiology*, 50, 1936-1942.

6. Stanford University HIV Drug Resistance Database. Accessed on July 9, 2017 at: http://hivdb.stanford.edu

7. Yang C., et al., (2010). Development and application of a broadly sensitive dried-bloodspot-based genotyping assay for global surveillance of HIV-1 drug resistance. *Journal of Clinical Microbiology,* 48(9), 3158-64.

8. Alcantara LCJ, et al. (2009). A Standardized Framework for Accurate, High-throughput Genotyping of Recombinant and Non-recombinant Viral Sequences. *Nucleic Acids Research*, doi: 10.1093/nar/gkp455.

9. de Oliveira T., et al. (2005). An Automated Genotyping System for Analysis of HIV-1 and other Microbial Sequences. *Bioinformatics*, 21(19), 3797-3800.

APPENDIX C ESTIMATES OF SAMPLING ERRORS

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

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

The standard error, which is the square root of the variance, is the usual measurement of sampling error for a particular statistic (e.g., proportion, mean, rate, count). In turn, the standard error can be used to calculate CI 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 percent of all possible samples of identical size and design.

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

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

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

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

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

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

Sampling errors for selected variables from MPHIA are presented in Tables C.1 through C.8. For each variable, sampling error tables include the weighted estimate, unweighted denominator, standard error, design effect, and lower and upper 95 percent confidence limits.

Table C.1 Sampling errors: Annual HIV incidence by age, MPHIA 2015-2016

Age (years)	Weighted estimate (%)	Design effect*	Lower confidence limit (%)	Upper confidence limit (%)
		TOTAL		
15-24	0.23	0.90	0.03	0.43
25-34	0.63	1.17	0.23	1.04
35-49	0.28	0.53	0.00	0.57
15-49	0.36	0.96	0.19	0.53
15-64	0.39	1.05	0.23	0.56
		MALES		
15-24	0.05	0.41	0.00	0.19
25-34	0.40	0.79	0.00	0.90
35-49	0.49	0.49	0.00	1.09
15-49	0.26	0.61	0.04	0.47
15-64	0.26	0.65	0.06	0.47
		FEMALES		
15-24	0.40	1.06	0.05	0.75
25-34	0.87	1.53	0.26	1.48
35-49	0.06	0.42	0.00	0.25
15-49	0.46	1.27	0.21	0.71
15-64	0.52	1.36	0.27	0.78

*where the design effect was less than 1.0, a value of 1.0 was used to calculate CI

Table C.2 Sampling errors: HIV prevalence by age, MPHIA 2015-2016

Age	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
			TOTAL		
0-17 months	0.4	496	0.3	0.0	0.9
18-59 months	1.4	1371	0.4	0.5	2.2
5-9	1.6	2201	0.4	0.8	2.3
10-14	2.1	2097	0.4	1.3	2.9
Total 0-4	1.1	1868	0.3	0.5	1.7
Total 0-14	1.5	6166	0.2	1.1	1.9
15-19	1.5	3143	0.2	1.0	2.0
20-24	3.8	3115	0.4	3.0	4.5
25-29	9.3	2449	0.7	7.9	10.7
30-34	14.9	2295	0.9	13.1	16.7
35-39	18.4	1862	1.1	16.3	20.6
40-44	21.7	1394	1.3	19.1	24.3
45-49	21.2	997	1.5	18.1	24.2
50-54	16.9	824	1.4	14.1	19.8
55-59	15.4	621	1.6	12.0	18.7
60-64	12.4	487	1.7	8.8	15.9
Total 15-24	2.5	6258	0.2	2.0	3.0
Total 15-49	10.0	15255	0.3	9.3	10.7
Total 15-64	10.6	17187	0.3	9.9	11.2
			MALES		
0-17 months	0.0	230	0.0	0.0	0.0
18-59 months	1.7	664	0.6	0.4	3.1
5-9	1.4	1057	0.4	0.6	2.2
10-14	2.0	1054	0.6	0.9	3.2
Total 0-4	1.3	894	0.5	0.3	2.3
Total 0-14	1.5	3005	0.3	0.9	2.1
15-19	0.9	1497	0.2	0.4	1.4
20-24	2.3	1181	0.5	1.3	3.3
25-29	4.7	938	0.7	3.3	6.1
30-34	12.1	870	1.3	9.4	14.7
35-39	14.5	765	1.5	11.4	17.6
40-44	18.6	609	1.7	15.2	22.1
45-49	22.1	446	2.1	17.7	26.5
50-54	17.5	355	2.2	12.9	22.1
55-59	14.5	295	2.1	10.1	19.0
60-64	10.6	252	2.1	6.3	14.9
Total 15-24	1.5	2678	0.3	1.0	2.1
Total 15-49	7.8	6306	0.4	7.0	8.5
Total 15-64	8.5	7208	0.4	7.8	9.2
			FEMALES		
0-17 months	0.7	266	0.5	0.0	1.8
18-59 months	0.9	707	0.4	0.2	1.7
5-9	1.8	1144	0.5	0.7	2.8
10-14	2.2	1043	0.6	1.0	3.3
Total 0-4*	0.9	974	0.3	0.2	1.5
Total 0-14	1.5	3161	0.2	1.1	2.0
15-19	2.0	1646	0.4	1.2	2.8
20-24	5.2	1934	0.6	4.0	6.4
25-29	13.6	1511	1.1	11.4	15.8
30-34	17.5	1425	1.2	15.0	19.9
35-39	22.1	1097	1.4	19.3	24.9
40-44	24.6	785	1.9	20.7	28.4
45-49	20.3	551	1.9	16.3	24.2
50-54	16.4	469	1.8	12.7	20.1
55-59	16.1	326	2.2	11.5	20.7
60-64	13.9	235	2.5	8.7	19.0
Total 15-24	3.4	3580	0.4	2.7	4.2
Total 15-49	12.1	8949	0.5	11.2	13.1
Total 15-64	12.5	9979	0.4	11.6	13.4

*One participant's age could not be clearly classified as 17 or 18 months. As a result, this participant is counted among females aged 0-4 years (N=974) but not among either females 0-17 months (N=266) or 18-59 months (N=707)

Table C.3 Sampling errors: HIV prevalence by residence and zone, ages 15-64 years, MPHIA 2015-2016

Characteristic	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
TOTAL					
Residence					
Urban	14.2	6433	0.5	13.2	15.3
Rural	9.7	10754	0.4	8.9	10.4
Zone					
North	7.4	2318	0.7	5.8	8.9
Central-East	4.9	2501	0.6	3.8	6.1
Central-West	6.1	2009	0.5	5.0	7.1
Lilongwe City	11.5	2994	0.7	10.1	12.8
South-East	15.3	1952	1.0	13.1	17.4
South-West	16.0	2732	0.9	14.1	18.0
Blantyre City	17.7	2681	0.9	16.0	19.5
MALES					
Residence					
Urban	10.8	2683	0.6	9.6	12.0
Rural	7.9	4525	0.4	7.0	8.8
Zone					
North	6.0	1017	0.6	4.8	7.2
Central-East	3.8	1160	0.5	2.7	4.8
Central-West	5.7	860	0.6	4.3	7.0
Lilongwe City	8.5	1265	0.7	7.0	9.9
South-East	12.5	742	1.4	9.6	15.5
South-West	13.1	1050	1.1	10.8	15.3
Blantyre City	14.0	1114	0.9	12.1	15.9
FEMALES					
Residence					
Urban	17.7	3750	0.8	16.2	19.3
Rural	11.3	6229	0.5	10.3	12.3
Zone					
North	8.7	1301	1.2	6.3	11.1
Central-East	6.2	1341	0.9	4.4	8.0
Central-West	6.4	1149	0.6	5.1	7.7
Lilongwe City	14.8	1729	1.0	12.8	16.8
South-East	17.4	1210	1.1	15.1	19.8
South-West	18.4	1682	1.4	15.7	21.2
Blantyre City	21.8	1567	1.1	19.4	24.2

Table C.4 Sampling errors: Viral load suppression by age, MPHIA 2015-2016					
Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
TOTAL					
0-14	42.3	96	6.2	29.5	55.1
15-24	46.0	214	3.9	37.9	54.2
25-34	62.9	668	2.2	58.4	67.4
35-44	71.7	759	2.0	67.6	75.8
45-54	77.5	400	3.0	71.4	83.7
55-64	78.0	179	3.9	70.0	86.0
Total 15-24	46.0	214	3.9	37.9	54.2
Total 15-49	66.6	1880	1.2	64.1	69.1
Total 15-64	68.3	2220	1.2	66.0	70.7
MALES					
0-14	38.0	46	8.3	20.8	55.1
15-24	37.2	43	7.6	21.6	52.8
25-34	48.2	159	4.5	39.0	57.4
35-44	62.9	248	3.1	56.4	69.3
45-54	74.5	176	4.2	65.8	83.1
55-64	69.8	86	6.0	57.5	82.2
Total 15-24	37.2	43	7.6	21.6	52.8
Total 15-49	58.1	556	2.2	53.5	62.6
Total 15-64	60.9	712	2.0	56.8	65.0
FEMALES					
0-14	46.8	50	8.2	29.9	63.7
15-24	49.7	171	4.6	40.2	59.1
25-34	70.1	509	2.3	65.3	74.8
35-44	77.5	511	2.3	72.7	82.3
45-54	80.7	224	3.6	73.3	88.0
55-64	84.2	93	4.6	74.8	93.5
Total 15-24	49.7	171	4.6	40.2	59.1
Total 15-49	71.7	1324	1.4	68.8	74.7
Total 15-64	73.1	1508	1.3	70.3	75.8

Table C.5 Sampling errors: Viral load suppression by residence and zone, ages 15-64 years, MPHIA 2015-2016

Characteristic	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
TOTAL					
Residence					
Urban	62.8	1059	1.9	59.0	66.6
Rural	70.4	1161	1.4	67.4	73.3
Zone					
North	67.7	181	3.0	61.5	73.8
Central-East	67.9	129	3.9	59.9	75.9
Central-West	70.6	138	3.7	62.9	78.3
Lilongwe City	64.9	398	2.7	59.3	70.4
South-East	70.7	335	2.6	65.4	76.1
South-West	69.8	496	2.3	65.0	74.7
Blantyre City	59.5	543	2.7	53.9	65.0
MALES					
Residence					
Urban	53.6	325	3.3	46.8	60.3
Rural	63.6	387	2.4	58.6	68.6
Zone					
North	62.6	67	5.2	51.9	73.3
Central-East	60.3	45	5.4	49.2	71.4
Central-West	66.3	56	5.3	55.3	77.2
Lilongwe City	53.7	119	4.7	44.0	63.4
South-East	59.8	104	5.0	49.6	70.0
South-West	63.5	150	4.3	54.7	72.4
Blantyre City	54.3	171	4.2	45.6	63.0
FEMALES					
Residence					
Urban	68.6	734	1.9	64.6	72.6
Rural	74.7	774	1.7	71.3	78.1
Zone					
North	71.2	114	3.6	63.7	78.7
Central-East	72.7	84	4.4	63.6	81.9
Central-West	74.3	82	4.1	65.8	82.7
Lilongwe City	71.9	279	3.1	65.6	78.3
South-East	77.1	231	3.2	70.5	83.7
South-West	73.5	346	2.3	68.6	78.3
Blantyre City	63.1	372	3.0	56.8	69.3

Table C.6 Sampling errors: ARV-adjusted 90-90-90 by age (conditional percentages), MPHIA 2015-2016

Age (years)	Diagnosed					On Treatment					Virally Suppressed				
	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
								TOTAL							
15-24	53.69	214	4.06	45.33	62.04	85.65	121	3.64	78.16	93.15	81.23	106	4.82	71.32	91.15
25-34	71.60	668	2.14	67.18	76.02	87.95	483	1.79	84.28	91.63	93.49	424	1.36	90.70	96.28
35-49	83.28	996	1.43	80.34	86.23	92.79	833	1.13	90.46	95.12	90.74	766	1.39	87.87	93.60
15-49	75.91	1878	1.15	73.53	78.28	90.62	1437	0.90	88.76	92.48	90.94	1296	1.06	88.75	93.13
15-64	76.84	2217	1.04	74.71	78.98	91.38	1720	0.78	89.77	92.99	91.28	1564	0.98	89.26	93.30
								MALES							
15-24	44.57	44	8.48	27.10	62.04	78.72	20	9.78	58.58	98.85	80.77	17	10.16	59.85	100.00
25-34	60.76	159	4.30	51.92	69.61	78.40	89	4.56	69.01	87.79	92.50	66	3.19	85.92	99.08
35-49	77.22	354	2.53	72.00	82.43	91.02	271	2.02	86.86	95.17	89.10	245	2.35	84.26	93.93
15-49	69.32	557	2.22	64.74	73.89	86.91	380	1.85	83.11	90.72	89.51	328	1.96	85.47	93.55
15-64	71.66	712	1.90	67.74	75.57	88.74	510	1.57	85.51	91.96	89.79	454	1.76	86.16	93.41
								FEMALES							
15-24	57.58	170	4.12	49.10	66.05	87.94	101	3.72	80.29	95.60	81.37	89	5.39	70.27	92.47
25-34	76.89	509	2.18	72.40	81.38	91.64	394	1.74	88.04	95.23	93.82	358	1.40	90.93	96.70
35-49	87.78	642	1.58	84.52	91.04	93.95	562	1.15	91.58	96.31	91.77	521	1.58	88.51	95.04
15-49	79.90	1321	1.23	77.37	82.43	92.57	1057	0.97	90.58	94.55	91.65	968	1.16	89.25	94.04
15-64	80.16	1505	1.16	77.77	82.55	92.89	1210	0.85	91.15	94.64	92.10	1110	1.06	89.92	94.27

Table C.7 Sampling errors: ARV-adjusted 90-90-90 by age (unconditional percentages), MPHIA 2015-2016

Age (years)	Diagnosed					On Treatment					Virally Suppressed				
	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
								TOTAL							
15-24	53.7	214	4.1	45.3	62.0	46.0	214	3.9	38.0	54.0	37.4	214	3.9	29.3	45.4
25-34	71.6	668	2.1	67.2	76.0	63.0	668	2.2	58.5	67.5	58.9	668	2.3	54.2	63.6
35-49	83.3	996	1.4	80.3	86.2	77.3	996	1.7	73.8	80.8	70.1	996	2.0	66.0	74.2
15-49	75.9	1878	1.2	73.5	78.3	68.8	1878	1.3	66.2	71.4	62.6	1878	1.4	59.8	65.3
15-64	76.8	2217	1.0	74.7	79.0	70.2	2217	1.1	67.9	72.6	64.1	2217	1.2	61.6	66.6
								MALES							
15-24	44.6	44	8.5	27.1	62.0	35.1	44	7.4	19.9	50.3	28.3	44	7.0	14.0	42.7
25-34	60.8	159	4.3	51.9	69.6	47.6	159	4.6	38.2	57.0	44.1	159	4.6	34.7	53.5
35-49	77.2	354	2.5	72.0	82.4	70.3	354	3.0	64.2	76.4	62.6	354	3.1	56.2	69.0
15-49	69.3	557	2.2	64.7	73.9	60.2	557	2.4	55.4	65.1	53.9	557	2.4	49.0	58.9
15-64	71.7	712	1.9	67.7	75.6	63.6	712	2.0	59.4	67.7	57.1	712	2.1	52.7	61.5
								FEMALES							
15-24	57.6	170	4.1	49.1	66.1	50.6	170	4.2	42.1	59.2	41.2	170	4.5	31.9	50.5
25-34	76.9	509	2.2	72.4	81.4	70.5	509	2.1	66.0	74.9	66.1	509	2.4	61.2	71.0
35-49	87.8	642	1.6	84.5	91.0	82.5	642	1.8	78.8	86.1	75.7	642	2.1	71.5	79.9
15-49	79.9	1321	1.2	77.4	82.4	74.0	1321	1.4	71.2	76.8	67.8	1321	1.5	64.6	70.9
15-64	80.2	1505	1.2	77.8	82.5	74.5	1505	1.3	71.8	77.1	68.6	1505	1.4	65.6	71.5

Table C.8 Sampling errors: Number of new infections annually and number of PLHIV, ages 15-64 years, MPHIA 2015-16

	Weighted estimate	Standard error	Lower confidence limit	Upper confidence limit
Number of new infections annually	27973	6347	14876	41070
Number of PLHIV	901341	26362	847048	955634

APPENDIX D SURVEY PERSONNEL

MPHIA Steering Committee

Charles Mwansambo
Davie Kalomba
Masauso Nzima
Andrew Auld
Victoria Geresomo
Maziko Matemba
Eddie Banda

Ministry of Health

Charles Mwansambo
Rose Nyirenda
Thoko Kalua
Mathews Kagoli
Andreas Jahn
Ben Chilima
George F. Bello
Bernard Mvula
Damson Kathyola
Frank Chimbwandira
Joseph Kasola
Khumbo Ngona
Mavuto Chiwaula
Michael Eliya
Nelson Dzinza
Ruben Mwenda
Sikhona Chipeta

ICAP at Columbia University-New York

Andrea Low
Allison George
Bereket Alemayehu
Curran Kennedy
David Hoos
Elizabeth Radin
Jessica Justman
Joanne Mantell
Joseph Elias
Hannah Chung
Karampreet Sachathep
Kiwon Lee
Larkin Callaghan
Melissa Metz
Nahima Ahmed
Neena Philip
Noelle Esquire
Oren Mayer
Rita Sondengam
Ruby Fayorsey
Sally Findley
Stephen Delgado
Steven Wynn
Suzue Saito
Yen Pottinger

ICAP at Columbia University-Malawi

Chakuya Gondwe
Christine Chung
Juliana Cuervo-Rojas
Dave Namakhwa
Evance Kalepa
Evans Nyongopa
Francis Ogallah
Gertrude Chipungu
Grand Silungwe
Helecks Mtengo
Huxley Kanyongoloka
Ibrahim Gamblem
Katanga Msiska
Khozgani Mzumara
Lusako Mwalwenje
Memory Mkandawire
Neema Kamuyango
Percy Mwenechanya
Phillip Mtambo
Rabecca Tukhuwa
Richard Ndhlovu
Ronald Mphande
Samantha Muwalo
Sandram Kamwendo
Sifelani Moyo
Stephen Nkoka
Sungani Zidana
Vincent Chidya

ICAP at Columbia University-South Africa

Blanche Pitt
Bright Phiri
Charles Wentz
Herbert Longwe
Oliver Murangandi
Pule Mphole
Takura Kupamupindi

CDC Atlanta

Anindya De
Avi Hakim
Chris Murrill
Bharat Parekh
Drew Voetsch
Eddas Bennet
Hetal Patel
Janet Burnett
Kat Sleeman
Katina Pappas-Deluca
Kristin Brown
Laura Porter
Meade Morgan
Melissa Cates
Mervi Detorio
Naomi Bock
Paul Stupp
Sarah Guagliardo
Sasi Jonnalagadda
Steve Gutreuter
Steve Kinchen
Steve McCracken
Tom Spira
Trudy Dobbs
Wolfgang Hladik

William Levine

CDC Malawi

Abdoulaye Sarr
Andrew Auld
Christine West
Danielle Payne
Evelyn Kim
Geoffrey Chipungu
Nellie Wadonda-Kabondo
Sundeep Gupta

National AIDS Council of Malawi

Davie Kalomba
Emmanuel Zenengeya
Blackson Matatiyo
Jessie Khaki
Lonjezo Sithole

UNAIDS

Masauso Nzima

National Statistics Office, Malawi

Jameson Ndawala
Isaac Chirwa

Centre for Social Research-Chancellor College

Coordinators

Alister Munthali
Blessings Chinsinga
John Kadzandira
Maxton Tsoka
Gowokani Chirwa
Joseph Chunga

Field Staff

Agness Chisenga
Agness Lakudzala
Albert Dzikolatha
Albert Mandala
Alex Labana
Alex Mwanyongo
Alice Duwa
Alice Kamwamba
Alice Khonje
Alinafe Bonongwe
Alinafe Nyambi
Andrew Mzumara
Angella Nkhoma
Annie Kachilika
Beston Robert
Blessings Chitsulo
Brian Kumanda
Bright Chisale
Bright Mbeye
Cedrick Njenjema
Charles Pumbwa
Chikondi Kamwendo
Chikumbutso Kapenda
Chimwemwe Kana
Christian Bvumbwe
Christina Ngulube
Christopher Manyenje
Christopher Singoyi
Claudia Ngoma
Clement Tembo
Cornelius Hara
Davie Sato
Dickson Thom
Diston Matchano
Doreen Chiumia
Dorica Mughogho
Dyton Chilewani
Edgar Thindwa
Edward Governor
Effie Bvutula
Effie Ghambi
Elishah Phiri
Ellen Maloto
Emmanuel Mkandawire
Emmie Chirwa
Enoch Maulana
Enock Chitimbe
Enock Mkwala
Enock Phiri
Ernest Kaundama
Ernest Moya
Esther Ngwira
Euwert Mlanga
Evelyn Mwangomba
Felix Simbeye
Fenton Msukwa
Fidelis Kasiya
Finias Matenje
Fiskani Msutu
Florida Kadzitche
Fransiska Zuza
Frazer Mkawa
Fred Bequiet
Gertrude Kumwenda
Getrude Navaya
Getson Uladi
Gift Makata
Gift Mbwele
Grace Chaweza
Grace Mwase
Grace Mwase
Grace Nkhata
Grant Kalua
Grecium Mataya
Grey Msiska
Happiness Kanyamula
Happy Chawawa
Henry Bvumbwe
Henry Howa
Herbert Nsambula
Ireen Ndawa
Jacob Bema
Jerome Katunga
Jesse Mwale
Jickson Chindungwa
Jimmie Manjombe
Joe Zonda
John Chilale
John Kafere
Jones Kadewere
Kennedy Mwalwanda
Kuleza Chigoneka
Lapken Saukira
Lauryn Chingwengwe
Lazarous Nyondo
Lillian Majawa
Linda Chisi
Linda Kalulu
Linda Maruwo
Linly Chinyama
Lucy Banda
Lusungu Kaunda
Mabvuto Tembenuka
MacDonald Chitekwe

Madalitso Banda
Margret Nyaika
Maria Banda
Maria Ndawala
Mariana Stima
Mark Mwalabu
Martha Kadzakumanja
Martha Mpamanda
Mary Machisa
Mathews Misoya
Matilda Phiri
Maureen Kaponya
Maxton
Mcpherson Simeji
Mercy Malinda
Mphatso Zimba
Mussa Mtayamo
Naomi Sanga
Nolia Phiri
Nwaka Mwambene
Obed Nkhata
Olive Mwango
Patricia Malekano
Patrick Kalengo
Paul Makaula
Pemphero Ndawala
Penjani Ngwira
Peter Mzuwala
Phillip Maiden
Precious Gomani
Precious Gumbo
Precious Ngwira
Prisca Kasiyamphanje
Prisca Luwe
Priscilla Wankhama
Regina Kamoto
Richard Bwanali
Richard Jamester
Richard Katikafwe
Rodwayo Ngulube
Ronald Chawinga
Salile Nakanga
Samuel Lunda
Saul Harawa
Savya Gondwe
Shadreck Mughogho
Shadreck Nyasulu
Shellie Mwenekisindile
Silvester Sichone
Simon Tchaka
Somani Misolo
Sophie Mtombosola
Sphiwe Mwalwanda
Stanley Azizi
Steven Monteiro
Susan Msuku
Suzgo Zimba
Symon Nyirenda
Synab Nyerenga
Tamanda Jumbe
Tamandani Juma
Thokozani Banda
Thokozani Chinomba
Thokozani Dausi
Thokozani Kachala
Tikhala Chunga
Tobias Maunde
Victor Nkhalamba
Victor Phiri
Victoria Thondoya
Wiza Msosa
Yohane Banda
Zione Mkangadzula

University of Malawi, College of Medicine – Johns Hopkins Project

Abel Maruwo
Alex Siyasiya
Arnold Wajomba
Dalitso Ngwalo
Dan Ndilipa
Dean Soko
Elizabeth Kampira
Frank Nyirongo
Ganizani Pidini
Harrison Dzimbiri
Isaac Singini
Jack Anderson
Janet Chiwaya
Jossen Munthali
Melvin Kamanga
Memory Kapoteza
Owen Mwapasa
Ruth Mthunzi
Sufia Dadabhai
Thomas Gondwe
Victoria Kaliwo
Wamba Khonyongwa

Westat

Adam Chu
Amanda Fournier
Baifan Li
Bhumika Pakai
Brandyn Fauble
Charisse McBride
Emily J. Hudak
Graham Kalton
Harold Bobbitt
Jackie Varenne
Jason Ives
Joy Curvan
Julia Shpigenur
Jyothi Pabbaraju
Karin Wilson
Karla Richie
Katherine Aronson
Emmanuel Aluko
Kenneth Marshall
Kiersten Johnson
Laura Alvarez Rojas
Lesa Houser
Lisa Bowser
Lori Andrews
Malinda Karunaratne
Mamadou Diallo
Marie Alexander
Monica Tolentino
Ratha Soumphontphakdy
Rick Mitchell
Roberto Miglietti
Ron Klinger
Sarah Woodruff
Sean Byrne
Thuzar Myo Myint
Vivian Wu
Weijia Ren

APPENDIX E HOUSEHOLD QUESTIONNAIRE

ENGLISH

MINISTRY OF HEALTH
MALAWI HIV IMPACT ASSESSMENT 2015
HOUSEHOLD QUESTIONNAIRE

TICK IF HOUSEHOLD SELECTED FOR CHILDREN'S SURVEY ☐

CONFIDENTIAL

HOUSEHOLD IDENTIFICATION

ZONE NAME: _____ **ZONE CODE** ☐☐

TRADITIONAL AUTHORITY: _____ **TA CODE** ☐☐

ENUMERATION AREA NAME: _____ **EA CODE** ☐☐

VILLAGE NAME: _____

NAME OF HOUSEHOLD HEAD: _____ **HH NUMBER** ☐☐

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

LANGUAGE OF INTERVIEW: ☐☐

NATIVE LANGUAGE OF RESPONDENT: ☐☐

TRANSLATOR USED? (Y/N) ☐

LANGUAGE CODES:
(01) ENGLISH
(02) CHICHEWA
(03) TUMBUKA
(04) OTHER (SPECIFY) _____

ZONAL CODES:
(01) NORTH
(02) CENTRAL EAST
(03) CENTRAL WEST
(04) SOUTH EAST
(05) SOUTH WEST
(06) BLANTYRE CITY
(06) LILONGWE CITY

SUPERVISOR:	SUPERVISOR CODE:	OFFICE EDITOR:	KEYED BY:
_____	☐☐☐☐	☐☐	☐☐
DATE: _____			

*** RESULTS CODES:**

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

START TIME			
START	Record the start time. USE 24 HOUR TIME. IF START TIME IS 3:12 PM, RECORD 15 HOURS, 12 MINUTES, NOT 03 HOURS, 12 MINUTES.	HOUR: ☐☐ MINUTES ☐☐	

HOUSEHOLD SCHEDULE

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	
						IF LESS THAN 2 YEARS, RECORD IN MONTHS.	
	Please give me the names of the persons who usually lives in your household or guests of the household who stayed here last night, starting with the head of the household. 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 ☐

☐ TICK HERE IF CONTINUATION SHEET USED

2A) 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 ☐

2B) Are there any other people who may not be members of your household such as domestic servants, lodgers, of friends who usually live here?

YES ☐ NO ☐

2C) Are there any guests or temporary visitors staying here, or anyone else who stayed here last night who we have not seen?

YES ☐ NO ☐

ADD TO SCHEDULE ◄

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
98 = DON'T KNOW

HOUSEHOLD SCHEDULE

LINE NO.	IF (NAME) IS **0-17 YEARS**				IF (NAME) IS 0-14 YEARS		
	EMANC STATUS	ORPHAN STATUS/PARENT OR GUARDIAN					
	Is (**NAME**) emancipated?	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 WILL FILL OUT CHILDREN'S MODULE FOR **(NAME)**	DO NOT READ: IS (**NAME**) ELIGIBLE FOR SURVEY?
(1)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1	Y N	Y N DK → 12		Y N DK → 14			Y N
2	Y N	Y N DK → 12		Y N DK → 14			Y N
3	Y N	Y N DK → 12		Y N DK → 14			Y N
4	Y N	Y N DK → 12		Y N DK → 14			Y N
5	Y N	Y N DK → 12		Y N DK → 14			Y N
6	Y N	Y N DK → 12		Y N DK → 14			Y N
7	Y N	Y N DK → 12		Y N DK → 14			Y N
8	Y N	Y N DK → 12		Y N DK → 14			Y N
9	Y N	Y N DK → 12		Y N DK → 14			Y N
10	Y N	Y N DK → 12		Y N DK → 14			Y N

	TOTAL ELIGIBLE MEN (ADULTS 15-64 YEARS AND EMANCIPATED MINORS)	☐☐
	TOTAL ELIGIBLE WOMEN (ADULTS 15 -64 YEARS AND EMANCIPATED MINORS)	☐☐
	TOTAL ELIGIBLE CHILDREN (10 TO 14 YEARS)	☐☐
	TOTAL ELIGIBLE CHILDREN (0 MONTHS TO 9 YEARS)	☐☐

HOUSEHOLD SCHEDULE

LINE NO.	IF (**NAME**) is 18-64 years	IF (**NAME**) is 0-17 years					
	SICK PERSON	SICKNESS AND RESIDENCE OF BIOLOGICAL PARENTS				**MOTHER DEAD OR SICK**	**FATHER DEAD OR SICK**
	CHECK COLUMNS 7 AND 8, IF UNDER 18 ➔ 17 IF 18 YEARS OR MORE: 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?	CHECK COLUMN 10, IF COLUMN 10 'N' OR 'DK' ➔ 21 IF COLUMN 10 '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 12, IF COLUMN 12 'N' OR 'DK' ➔ 23 IF COLUMN 12 '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 10 'N') OR BEEN SICK (COLUMN 18 'Y'), SELECT Y.	IF CHILD'S NATURAL FATHER HAS DIED (COLUMN 12'N') OR BEEN SICK (COLUMN 20 'Y'), SELECT Y.
(1)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
1	Y N	Y N DK → 19	Y N DK	Y N DK → 21	Y N DK	Y N	Y N
2	Y N	Y N DK → 19	Y N DK	Y N DK → 21	Y N DK	Y N	Y N
3	Y N	Y N DK → 19	Y N DK	Y N DK → 21	Y N DK	Y N	Y N
4	Y N	Y N DK → 19	Y N DK	Y N DK → 21	Y N DK	Y N	Y N
5	Y N	Y N DK → 19	Y N DK	Y N DK → 21	Y N DK	Y N	Y N
6	Y N	Y N DK → 19	Y N DK	Y N DK → 21	Y N DK	Y N	Y N
7	Y N	Y N DK → 19	Y N DK	Y N DK → 21	Y N DK	Y N	Y N
8	Y N	Y N DK → 19	Y N DK	Y N DK → 21	Y N DK	Y N	Y N
9	Y N	Y N DK → 19	Y N DK	Y N DK → 21	Y N DK	Y N	Y N
10	Y N	Y N DK → 19	Y N DK	Y N DK → 21	Y N DK	Y N	Y N

HOUSEHOLD SCHEDULE

LINE NO.	SPOUSES AND CO-HABITATING PARTNERS					
	Record the LINE NUMBER (**NAME**)'s of spouse or partner. If no spouse or partner leave blank.	Record the LINE NUMBER (**NAME**)'s of spouse or partner. If no spouse or partner leave blank.	Record the LINE NUMBER (**NAME**)'s of spouse or partner. If no spouse or partner leave blank.	Record the LINE NUMBER (**NAME**)'s of spouse or partner. If no spouse or partner leave blank.	Record the LINE NUMBER (**NAME**)'s of spouse or partner. If no spouse or partner leave blank.	Record the LINE NUMBER (**NAME**)'s of spouse or partner. If no spouse or partner leave blank.
(1)	(23a)	(23b)	(23c)	(23d)	(23e)	(23f)
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
SUPPORT FOR ORPHANS AND VULNERABLE CHILDREN			
101	DO NOT READ: CHECK COLUMN 7 IN THE HOUSEHOLD SCHEDULE. **ANY CHILD AGE 0-17 YEARS**?	NUMBER OF CHILDREN 0-17 YRS: ☐☐	NONE →114
102	DO NOT READ: CHECK COLUMN 16 IN THE HOUSEHOLD SCHEDULE. **ANY SICK ADULT AGE 18-64 YEARS?**	YES.....1 NO.....2	YES → 105
103	DO NOT READ: CHECK COLUMN 21 IN THE HOUSEHOLD SCHEDULE. **ANY CHILD WHOSE MOTHER HAS DIED OR IS VERY SICK?**	YES.....1 NO.....2	YES → 105
104	DO NOT READ: CHECK COLUMN 22 IN THE HOUSEHOLD SCHEDULE. **ANY CHILD WHOSE FATHER HAS DIED OR IS VERY SICK?**	YES.....1 NO.....2	NO → 114

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES & SKIPS

105	**Record names, line numbers, and ages of all children 0-17 who are identified in columns 16, 21, and 22 as having a sick adult in their household or having a mother and/or father who has died or has been very sick.**			
		CHILD (1)	CHILD (2)	CHILD (3)
	NAME	_____	_____	_____
	LINE NUMER (FROM COLUMN 1)	☐☐	☐☐	☐☐
	AGE (FROM COLUMN 7)	☐☐	☐☐	☐☐
	➢ **INTERVIEWER SAY: "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."**			
106	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	YES……1 NO……..2 DON'T KNOW……..8	YES……1 NO……..2 DON'T KNOW……..8

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES & SKIPS		
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 NO, DK→ 109	YES……1 NO……..2 DON'T KNOW……..8 NO, DK→ 109	YES……1 NO……..2 DON'T KNOW……..8 NO, DK→ 109

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES & SKIPS		
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	YES……1 NO……..2 DON'T KNOW……..8	YES……1 NO……..2 DON'T KNOW……..8
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 NO, DK → 111	YES……1 NO……..2 DON'T KNOW……..8 NO, DK→ 111	YES……1 NO……..2 DON'T KNOW……..8 NO, DK→ 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	YES……1 NO……..2 DON'T KNOW……..8	YES……1 NO……..2 DON'T KNOW……..8
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 NO, DK → 113	YES……1 NO……..2 DON'T KNOW……..8 NO, DK → 113	YES……1 NO……..2 DON'T KNOW……..8 NO, DK → 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	YES……1 NO……..2 DON'T KNOW……..8	YES……1 NO……..2 DON'T KNOW……..8
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 SKIP IF CHILD <5 YEARS	YES……1 NO, DID NOT RECEIVE SUPPORT……2 NO, CHILD DOES NOT ATTEND SCHOOL ……..3 DON'T KNOW……..8 SKIP IF CHILD <5 YEARS	YES……1 NO, DID NOT RECEIVE SUPPORT……2 NO, CHILD DOES NOT ATTEND SCHOOL ……..3 DON'T KNOW……..8 SKIP IF CHILD <5 YEARS

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES & SKIPS

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				
114	Now I would like to ask you more questions about your household. Has any usual resident of your household died since 2013?	YES……1 NO……2		NO → 201
115	How many usual household residents died since 2013?	NUMBER OF DEATHS…… ☐☐		
	ASK 116-120 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)?	NAME 1ST DEATH _____	NAME 2ND DEATH _____	NAME 3RD DEATH _____
117	When did (NAME) die? Please give your best guess.	DAY ☐☐ MONTH ☐☐ YEAR ☐☐	DAY ☐☐ MONTH ☐☐ YEAR ☐☐	DAY ☐☐ MONTH ☐☐ YEAR ☐☐
118	Was (NAME) male or female?	MALE ……1 FEMALE……2	MALE ……1 FEMALE……2	MALE ……1 FEMALE……2

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES & SKIPS

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 ☐☐	DAYS ☐☐ MONTHS ☐☐ YEARS ☐☐	DAYS ☐☐ MONTHS ☐☐ YEARS ☐☐
	CONTINUE TO NEXT DEATH ACCORDING UP TO THE NUMBER REPORTED FROM 115. ☐ **TICK IF CONTINUATION SHEET REQUIRED.**			

HOUSEHOLD CHARACTERISTICS

201	What is the <u>main</u> 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 OTHER……..96 _____ (SPECIFY)	

202	Do you do anything to the water to make it safer to drink?	YES …… 1 NO ……2 DON'T KNOW ……8	NO, DK→204
203	What do you do to make your water safe for drinking? RECORD ALL MENTIONED.	BOIL……A ADD BLEACH/CHLORINE ……..B STRAIN THROUGH A CLOTH……C USE A WATER FILTER……..D SOLAR DISINFECTION……..……..E LET IT STAND AND SETTLE..……F OTHER……..X _____ (SPECIFY) DON'T KNOW ……..Z	
204	What kind of toilet facility do members of your household usually use?	FLUSH OR POUR FLUSH TOILET…….11 VENTILATED IMPROVED PIT LATRINE (VIP)……..21 PIT LATRINE WITH SLAB……22 PIT LATRINE WITHOUT SLAB/ OPEN PIT……..23 COMPOSTING TOILET……..31 BUCKET TOILET ……41 HANGING TOILET/ HANGING LATRINE……...51 NO FACILITY/BUSH/FIELD…….....61 OTHER……96 _____ (SPECIFY)	NO FACILITY, OTHER → 207
205	Do you share this toilet facility with other households?	YES……...…1 NO……..…2	
206	How many households use this toilet facility?	NO. OF HOUSEHOLD IF LESS THAN 10 _____ 10 OR MORE HOUSEHOLDS ……96 DON'T KNOW ……98	

PREFACE BEFORE QUESTIONS 207-215: Does your household have:			
207	Electricity?	YES……1 NO……2	
208	Paraffin lamp?	YES……1 NO……2	
209	A radio?	YES……1 NO……2	
210	A television?	YES……1 NO……2	
211	A telephone/mobile telephone?	YES……1 NO……2	
212	A bed with mattress?	YES……1 NO……2	
213	A sofa set?	YES……1 NO……2	
214	Table and chair(s)?	YES……1 NO……2	
215	A refrigerator?	YES……1 NO……2	
216	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……7 DUNG……8 NO FOOD COOKED IN HOUSEHOLD……95 OTHER……96 _____ (SPECIFY)	

217	MAIN MATERIAL OF FLOOR RECORD OBSERVATION.	**NATURAL FLOOR** EARTH / SAND……11 DUNG……12 **RUDIMENTARY FLOOR** WOOD PLANKS……..21 PALM / BAMBOO……22 BROKEN BRICKS ……..23 **FINISHED FLOOR** PARQUET OR POLISHED WOOD……31 VINYL OR ASPHALT STRIP……32 CERAMIC TILES……33 CEMENT/TERAZO……34 CARPET……..35 OTHER……96 _____ (SPECIFY)	
218	MAIN MATERIAL OF THE ROOF RECORD OBSERVATION.	**NATURAL ROOFING** NO ROOF……11 THATCH/PALM LEAF……12 SOD……..13 **RUDIMENTARY ROOFING** RUSTIC MAT……21 PALM/BAMBOO……22 WOOD PLANKS……..23 CARDBOARD……..24 **FINISHED ROOFING** METAL……..31 WOOD……32 CALAMINE/CEMENT FIBER……33 CERAMIC TILES ……34 CEMENT ……35 ROOFING SHINGLES ……36 OTHER……96 _____ (SPECIFY)	

219	MAIN MATERIAL OF THE EXTERIOR WALLS RECORD OBSERVATION.	**NATURAL WALLS** NO WALLS……11 CANE/PALM/TRUNKS……12 DIRT……13 **RUDIMENTARY WALLS** BAMBOO WITH MUD……21 STONE WITH MUD……22 UNCOVERED ADOBE……23 PLYWOOD……24 CARDBOARD……25 REUSED WOOD……26 **FINISHED WALLS** CEMENT……31 STONE WITH LIME/CEMENT……32 BRICKS……33 CEMENT BLOCKS……34 COVERED ADOBE……35 WOOD PLANKS/SHINGLES……36 OTHER……96 _____ (SPECIFY)	
220	How many rooms are used for sleeping?	NUMBER OF ROOMS: ☐☐	

PREFACE BEFORE QUESTIONS 221-224: Does any member of your household own:			
221	A bicycle?	YES……1 NO……2	
222	A motorcycle or motor scooter?	YES……1 NO……2	
223	A car or truck?	YES……1 NO……2	
224	A watch?	YES……1 NO……2	
PREFACE BEFORE QUESTIONS 225-229: Does any member of your household own:			
225	Goats?	YES……1 NO……2	
226	Pigs?	YES……1 NO……2	

227	Cattle ?	YES……..…1 NO……..…2	
228	Sheep?	YES……..…1 NO……..…2	
229	Chickens?	YES……..…1 NO……..…2	

ECONOMIC SUPPORT			
301	Has your household received any of the following forms of external economic support in the last 12 months? SELECT ALL THAT APPLY.	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 OTHER……..X _____ (SPECIFY) DON'T KNOW ……..Z	NOTHING, DK →END OF SECTION
301	Has your household received any of the following forms of external economic support in the last 3 months? SELECT ALL THAT APPLY.	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 OTHER……..X _____ (SPECIFY) DON'T KNOW ……..Z	

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."**

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

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	IS THE RESPONDENT MALE OR FEMALE?	MALE = 1 FEMALE = 2	
102	How old were you at your last birthday?	AGE IN COMPLETED YEARS _ _ DON'T KNOW AGE = -8 REFUSED = -9	
103	Have you ever attended school?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 107
104	Are you enrolled in school?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	DK, REFUSED →107

105	What is the highest level of school you attended: primary, secondary, or higher?	PRIMARY = 1 SECONDARY = 2 HIGHER = 3 DON'T KNOW = -8 REFUSED = -9	
106	What is the highest [class/form/year] you completed at that level?	CLASS/FORM/YEAR _____ DON'T KNOW = -8 REFUSED = -9	
107	Have you done any work in the last 12 months for which you received a paycheck, cash or goods as payment?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
108	What is your ethnic group/tribe?	NKHONDE = 1 TUMBUKA= 2 TONGA = 3 YAO = 4 CHEWA = 5 SENA = 6 LOMWE = 7 NGONI = 8 OTHER = 96 DON'T KNOW = -8 REFUSED = -9	
109	What is your religion?	CATHOLIC = 1 CCAP = 2 ANGLICAN = 3 SEVENTH DAY ADVENTIST= 4 BAPTIST = 5 OTHER CHRISTIAN = 6 MUSLIM = 7 NO RELIGION = 8 OTHER = 96 DON'T KNOW = -8	

		REFUSED = -9	
110	What country were you born?	MALAWI = 1 ZAMBIA = 2 TANZANIA= 3 MOZAMBIQUE = 4 ZIMBABWE = 5 NIGERIA = 6 RWANDA = 7 BURUNDI = 8 OTHER = 96 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	NO, DK, 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?	AGE IN YEARS ___ ___ DON'T KNOW = -8 REFUSED = -9	
203	Have you ever been widowed? That is, did a spouse ever die while you were still married or living with them?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSE TO ANSWER = -9	
204	What is your marital status now: are you married, living together with someone as if married, widowed, divorced, or separated?	MARRIED = 1 LIVING TOGETHER = 2 WIDOWED = 3 DIVORCED = 4 SEPARATED = 5 DON'T KNOW = -8 REFUSED = -9	WIDOWED, DIVORCED, SEPARATED, DK, REFUSED → NEXT MODULE

Interviewer says: "The next several questions are about your current spouse or partner(s)."			
205	Do you have more than one wife or woman you live with as if married?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSE TO ANSWER = -9	YES →208 DK, REFUSED →SKIP TO NEXT MODULE SKIP IF FEMALE
206	Is your wife or partner living with you now or is she staying elsewhere?	LIVING TOGETHER = 1 STAYING ELSEWHERE = 2 DON'T KNOW = 8 REFUSE TO ANSWER = -9	STAYING ELSEWHERE, DK, REFUSED →SKIP TO NEXT MODULE SKIP IF FEMALE
207	RECORD THE LINE NUMBER FROM THE HOUSEHOLD SCHEDULE OF THE SPOUSE OR LIVE-IN PARTNER. IF THE PERSON IS NOT LISTED IN THE HOUSEHOLD, RECORD '00'.	LINE NUMBER __ __	ALL → SKIP TO NEXT MODULE SKIP IF FEMALE
208	Altogether, how many wives or partners do you have?	NUMBER OF WIVES OR PARTNERS _____ DON'T KNOW = -8 REFUSED = -9	DK, REFUSED →SKIP TO NEXT MODULE SKIP IF FEMALE
209	Please tell me the name of each of your current wives that <u>live</u> with you and/or of each woman you are living with as if married. RECORD THE LINE NUMBER(S) FROM THE HOUSEHOLD QUESTIONNAIRE FOR EACH SPOUSE AND LIVE-IN PARTNER. IF THE PERSON IS NOT LISTED IN THE HOUSEHOLD, RECORD '00'. ASK 209 FOR EACH PERSON.	LINE NUMBER __ ___	ALL→ SKIP TO NEXT MODULE SKIP IF FEMALE
210	Is your husband or partner living with you now or is he staying elsewhere?	LIVING TOGETHER = 1 STAYING ELSEWHERE = 2 DON'T KNOW = 8 REFUSE TO ANSWER = -9	STAYING ELSEWHERE, DK, REFUSED →212

211	RECORD THE LINE NUMBER FROM THE HOUSEHOLD SCHEDULE OF THE SPOUSE OR LIVE-IN PARTNER. IF THE PERSON IS NOT LISTED IN THE HOUSEHOLD, RECORD '00'.	LINE NUMBER __ __	
212	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 REFUSE TO ANSWER = -9	NO, DK, REFUSED→ SKIP TO NEXT MODULE
213	Including yourself, in total, how many wives or live-in partners does your husband or partner have?	NUMBER OF WIVES OR LIVE-IN PARTNERS _ _ DON'T KNOW = -8 REFUSE TO ANSWER = -9	

MODULE 3: REPRODUCTION			
Interviewer says: "Now I would like to ask you questions about your pregnancies and your children."			IF MALE SKIP TO 356.
301	How many times have you been pregnant including a current pregnancy? CODE '00' IF NONE.	NUMBER OF TIME(S) ____ DON'T KNOW = -8 REFUSED = -9	NONE, DK, REFUSED → 356
302	Have you ever 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.	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = -9	NO, DK, REFUSED →354
303	In total, how many children have you given birth to who were born alive? These include children who were born alive but later died. They could have been children who have lived with you or have notlived with you.	NUMBER OF CHILDREN ____ DON'T KNOW = -8 REFUSED = -9	

MODULE 3: REPRODUCTION			
304	How many children have you given birth to since 2012? CODE '00' IF NONE.	NUMBER OF CHILDREN ____ DON'T KNOW = -8 REFUSED = -9	NONE, DK, REFUSED →354

Interviewer says: "Now I would like to ask you some questions about the last pregnancy that resulted in a live birth since 2012."			
305	Did your last pregnancy result in birth to twins or more?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = -9	
306	What is the name of the child from your last pregnancy that resulted in a live birth? A live birth is when the baby shows signs of life, such as breathing, beating of the heart or movement. IF MULTIPLE BIRTH, LIST ALL NAMES. IF THE CHILD WAS NOT NAMED BEFORE DEATH, INPUT BIRTH 1.	NAME _____	
307	When you were pregnant with **(NAME)**, did you plan to get pregnant at that time?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = -9	
308	When you were pregnant with **(NAME)**, did you visit a health facility for antenatal care?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = -9	YES →310 DK, REFUSED →327
309	What is the <u>main</u> reason you did not visit a clinic for antenatal care when you were pregnant with	CLINIC WAS TOO FAR AWAY= 1	ALL→ 327

	(NAME)?	COULD NOT TAKE TIME OFF WORK/TOO BUSY = 2 COULD NOT AFFORD TO PAY FOR THE VISIT = 3 DID NOT TRUST THE CLINIC STAFF = 4 RECEIVED CARE AT HOME = 5 DID NOT WANT AN HIV TEST DONE = 6 HUSBAND/FAMILY WOULD NOT LET ME GO = 7 USED TRADITIONAL BIRTH ATTENDANT/HEALER = 8 COST OF TRANSPORT = 9 OTHER = 96 DON'T KNOW = -8 REFUSED = -9	
310	At what months in your pregnancy did you attend the antenatal clinic? SELECT ALL THAT APPLY.	0-3 MONTHS/1ST TRIMESTER = A 4-6 MONTHS/2ND TRIMESTER = B 7-9 MONTHS/3RD TRIMESTER = C DON'T KNOW =Y REFUSED = Z	ELECTRONIC AID IF DON'T KNOW IF 1ST TRIMESTER, DON'T KNOW, REFUSED SELECTED SKIP TO 312.
311	Why did you not attend the antenatal clinic during your first trimester when you were pregnant with **(NAME)**? SELECT ALL THAT APPLY.	DID NOT NEED TO GO DURING FIRST TRIMESTER = A DID NOT KNOW I WAS PREGNANT = B CLINIC TOO FAR AWAY = C COULD NOT TAKE TIME OFF WORK/TOO BUSY = D COSTS TOO MUCH = E DID NOT WANT HIV TEST DONE = F DID NOT WANT PEOPLE TO KNOW THAT I WAS PREGNANT = G CLINIC STAFF WOULD HAVE TURNED ME AWAY BECAUSE TOO EARLY IN PREGNANCY = H	

		DID NOT THINK PREGNANCY TEST KITS WOULD BE AVAILABLE = I CLINIC TOO BUSY = J WANTED TO AVOID MULTIPLE CLINIC VISITS = K OTHER = X DON'T KNOW = Y REFUSED = Z	
312	Where did you go to when you received antenatal care when you were pregnant with **(NAME)**? Did you go to a public facility, CHAM or another private facility?	PUBLIC CLINIC/HOSPITAL= 1 CHAM HOSPITAL = 2 OTHER PRIVATE CLINIC/HOSPITAL = 3 BOTH PUBLIC AND PRIVATE= 4 DON'T KNOW = 8 REFUSED = -9	
Interviewer saysy: "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."			
313	Have you ever tested for HIV before your pregnancy with **(NAME)**?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = -9	NO, DK, REFUSED → 316
314	Did you test positive for HIV before your pregnancy with **(NAME)**?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = -9	NO, DK, REFUSED → 316
315	At the time of your first antenatal care visit when you were pregnant with **(NAME)**, were you taking ARVs, that is, antiretroviral medications, to treat HIV?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = -9	YES →323 NO, DK, REFUSED →320 ELECTRONIC AID IF DON'T KNOW
316	During any of your visits to the antenatal care clinic when you were pregnant with **(NAME)**, were you <u>offered</u> an HIV test?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = -9	

317	Were you tested for HIV during any of your antenatal care clinic visits when you were pregnant with **(NAME)**?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = -9	YES →319 DK, REFUSED →323
318	What is the main reason you were not tested for HIV during antenatal care with **(NAME)**?	DID NOT WANT AN HIV TEST DONE / DID NOT WANT TO KNOW MY STATUS = 1 DID NOT RECEIVE PERMISSION FROM SPOUSE/FAMILY = 2 AFRAID OTHERS WOULD KNOW ABOUT TEST RESULTS = 3 DID NOT NEED TEST/LOW RISK = 4 OTHER = 6 DON'T KNOW = 8 REFUSED = -9	ALL→SKIP TO 323
319	What was the result of your last HIV test during your pregnancy with **(NAME)**?	POSITIVE = 1 NEGATIVE = 2 UNKNOWN/INDETERMINATE = 3 DID NOT RECEIVE RESULTS = 4 DON'T KNOW = 8 REFUSED = -9	POSITIVE → 320 ELSE → 323
320	Did you take ARVs during your pregnancy with **(NAME)** to stop **(NAME)** from getting HIV?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = -9	YES → 322 DK, REFUSED → 323 ELECTRONIC AID IF DON'T KNOW
321	What was the main reason you did not take ARVs while you were pregnant with **(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	ALL→323

		MEDICATIONS = 6 MEDICATIONS OUT OF STOCK = 7 DID NOT WANT PEOPLE TO KNOW HIV STATUS=8 DID NOT RECEIVE PERMISSION FROM SPOUSE/FAMILY =9 OTHER = 96 DON'T KNOW = -8 REFUSED = -9	
322	How many months pregnant were you when you started taking ARVs?	MONTHS 1-3/1ST TRIMESTER = 1 MONTHS 4-6/2ND TRIMESTER = 2 MONTHS 7-9/3RD TRIMESTER = 3 DON'T KNOW = 8 REFUSED = -9	ELECTRONIC AID IF DON'T KNOW
323	When you were pregnant with **(NAME)**, were you offered a test for syphilis?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = -9	
324	When you were pregnant with **(NAME)**, were you tested for syphilis?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = -9	NO, DK, REFUSED → 327
325	Did you test positive for syphilis during your pregnancy with **(NAME)**?	YES = 1 NO = 2 DID NOT GET RESULT = 3 DON'T KNOW = 8 REFUSED = -9	NO, NO RESULT, DK, REFUSED → 327
326	Did you get treatment for syphilis during your pregnancy with (NAME)?	YES = 1 NO = 2 DON'T KNOW = 8	

		REFUSED = -9	
327	Where did you give birth to **(NAME)**?	AT HOME = 1 AT A HEALTH FACILITY = 2 IN TRANSIT = 3 AT TRADITIONAL BIRTH ATTENDANT HOME/CLINIC = 4 OTHER = 96 DON'T KNOW = 8 REFUSED = -9	HOME, TRANSIT, TBA, OTHER, DK, REFUSED →333
328	Were you offered an HIV test during labor?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = -9	
329	Did you test for HIV during labor?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = -9	NO, DK, REFUSED →333 SKIP IF HIV POSITIVE
330	What was the result of that test?	POSITIVE = 1 NEGATIVE = 2 UNKNOWN/INDETERMINATE = 3 DID NOT RECEIVE RESULTS = 4 DON'T KNOW = 8 REFUSED = -9	NEG, UNK/IND, NO SRESULTS, DK, REFUSED →333 SKIP IF HIV POSITIVE
331	During labor, did you take ARVs to protect **(NAME)** against HIV?	YES = 1 NO, OFFERED BUT DID NOT TAKE = 2 NO, NOT OFFERED = 3 DON'T KNOW = 8 REFUSED = -9	NO, DK, REFUSED →333 ELECTRONIC AID IF DON'T KNOW
332	Did you continue to take the ARVs	YES = 1	

	after delivery?	NO= 2 DON'T KNOW =8 REFUSED = -9	
333	When did you give birth to **(NAME)**? Please give your best guess.	DAY ___ ___ DON'T KNOW DAY= -8 REFUSED DAY= -9 MONTH __ __ DON'T KNOW MONTH= -8 REFUSED MONTH= -9 YEAR __ __ __ __ DON'T KNOW YEAR= -8 REFUSED YEAR= -9	
334	Is **(NAME)** still alive?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSE = 9	YES, DK, REFUSED→336 IF MULTIPLE ASK 334-353 FOR EACH CHILD.
335	When did **(NAME)** die?	DAY ___ DON'T KNOW DAY = -8 REFUSED DAY = -9 MONTH ____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR _____ = -8= -9= -8= -9DON'T KNOW YEAR = -998 REFUSED YEAR = -999	ALL→338
336	Is **(NAME)** living with you?	YES = 1 NO = 2	NO→338
337	RECORD HOUSEHOLD LINE NUMBER OF CHILD RECORD '00' IF CHILD NOT LISTED IN HOUSEHOLD	HOUSEHOLD LINE NUMBER ___	

338	Did **(NAME)** take any ARVs to stop [him/her] from getting HIV infection? This would be before **(NAME)**'s first HIV test.	YES = 1 NO, DID NOT TAKE ARVS = 2 NO, CHILD NOT ALIVE = 3 DON'T KNOW = 8 REFUSED = 9	NO, NOT ALIVE, DK, REFUSED → 340 ELECTRONIC AID IF DON'T KNOW SKIP IF HIV MOTHER IS HIV NEGATIVE.
339	For how long did **(NAME)** take the ARVs to stop [him/her] from getting HIV? CODE '00' IF LESS THAN ONE WEEK. ONLY ONE OPTION MAY BE SELECTED. FOR EXAMPLE, ANSWER ONLY IN WEEKS OR IN MONTHS.	WEEKS_____ MONTHS _____ ARVs TAKEN ONCE = 96 STILL TAKING ARVs = 97 DON'T KNOW = -8 REFUSED = -9	SKIP IF MOTHER IS HIV NEGATIVE.
340	Did **(NAME)** take Bactrim or cotrimoxazole? This would be before (**NAME**)'s first HIV test. Bactrim or cotrimoxazole is a medicine recommended for people with HIV, even if they have not started treatment for HIV. It help prevents certain infections but it is not treatment for HIV.	YES = 1 NO, DID NOT TAKE COTRIM = 2 NO, CHILD NOT ALIVE = 3 DON'T KNOW = 8 REFUSED = 9	NO, NOT ALIVE, DK, REFUSED → 342 ELECTRONIC AID IF DON'T KNOW SKIP IF HIV MOTHER IS HIV NEGATIVE.
341	For how long did **(NAME)** take Bactrim or cotrimoxazole? ONLY ONE OPTION MAY BE SELECTED. FOR EXAMPLE, ANSWER ONLY IN WEEKS OR IN MONTHS. CODE '00' IF LESS THAN ONE WEEK.	WEEKS_____ MONTHS ____ STILL TAKING COTRIMOXAZOLE = 97 DON'T KNOW = -8 REFUSED = -9	SKIP IF MOTHER IS HIV NEGATIVE.
342	Did you ever breastfeed **(NAME)**?	YES = 1 NO, NEVER BREASTFED = 2 NO, CHILD NOT ALIVE = 3 DON'T KNOW = 8 REFUSED = 9	NO, NOT ALIVE, DK, REFUSED → 347

343	Are you still breastfeeding **(NAME)**?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	YES →345 DK, REFUSED →347
344	For how long did you breastfeed **(NAME)**? ONLY ONE OPTION MAY BE SELECTED. FOR EXAMPLE, ANSWER ONLY IN WEEKS OR IN MONTHS. CODE '00" WEEKS IF LESS THAN 1 WEEK.	WEEKS ____ MONTHS ____ DON'T KNOW = -8 REFUSED = -9	
345	How old was **(NAME)** when you started giving **(NAME)** cow's/goat's milk, powdered milk, water, or any other foods or liquid? ONLY ONE OPTION MAY BE SELECTED. FOR EXAMPLE, ANSWER ONLY IN MONTHS OR IN YEARS. CODE '00' IF LESS THAN 1 MONTH.	MONTHS __ __ YEARS __ __ NEVER = 96 DON'T KNOW = -8 REFUSED = -9	
346	Did you continue taking ARVs while you were breastfeeding (NAME)?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	SKIP IF ONLY ONE TIME MED. SKIP IF HIV NEGATIVE. SKIP IF NOT TAKING ARVS.
347	After **(NAME)** was born, was he/she tested for HIV?	YES = 1 NO, NOT TESTED FOR HIV = 2 NO, CHILD NOT ALIVE= 3 DON'T KNOW = 8 REFUSED = 9	YES →349 NO, NOT ALIVE, DK, REFUSED →353 SKIP IF MOTHER IS HIV NEGATIVE. SKIP IF CURRENTLY BREASTFEEDING.
348	While you were breastfeeding, was **(NAME)** tested for HIV?	YES = 1 NO, NOT TESTED FOR HIV = 2 NO, CHILD NOT ALIVE = 3	NO, NOT ALIVE, DK, REFUSED →351 SKIP IF MOTHER IS HIV NEGATIVE.

		DON'T KNOW = 8 REFUSED = 9	
349	How old was **(NAME)** when he/she first tested for HIV? ONLY ONE OPTION MAY BE SELECTED. FOR EXAMPLE, ANSWER ONLY IN WEEKS, MONTHS OR IN YEARS. CODE '000' IF LESS THAN 1 WEEK.	WEEKS ____ MONTHS _____ YEARS _____ DON'T KNOW = -8 REFUSED = -9	SKIP IF MOTHER IS HIV NEGATIVE.
350	What was the result of **(NAME)**'s first HIV test?	POSITIVE, **CHILD** HAS HIV = 1 NEGATIVE, **CHILD** DOES NOT HAVE HIV = 2 UNKNOWN/INDETERMINATE = 3 DID NOT RECEIVE RESULTS = 4 DON'T KNOW = 8 REFUSED = 9	SKIP IF MOTHER IS HIV NEGATIVE.
351	After you stopped breastfeeding, was **(NAME)** tested for HIV?	YES = 1 NO, NOT TESTED FOR HIV = 2 NO, CHILD NOT ALIVE = 3 DON'T KNOW = 8 REFUSED = 9	NO, NOT ALIVE, DK, REFUSED → 353 SKIP IF MOTHER IS HIV NEGATIVE. SKIP IF CHILD ALREADY HIV POSITIVE. SKIP IF NEVER BREASTFED OR CURRENTLY BREASTFEEDING..
352	What was the result of **(NAME)**'s HIV test?	POSITIVE, **CHILD** HAS HIV = 1 NEGATIVE, **CHILD** DOES NOT HAVE HIV = 2 UNKNOWN/INDETERMINATE = 3 DID NOT RECEIVE RESULTS = 4 DON'T KNOW = 8 REFUSED = 9	SKIP IF MOTHER IS HIV NEGATIVE. SKIP IF CHILD ALREADY HIV POSITIVE. SKIP IF NEVER BREASTFED OR CURRENTLY BREASTFEEDING.
353	Thank you for the information regarding **(NAME)**. DID THE RESPONDENT HAVE MORE	YES = 1 NO = 2	YES →RETURN TO 334 FOR MULTIPLES

	THAN ONE CHILD (I.E. TWINS, TRIPLETS)?		

Interviewer says:"I will now ask about current pregnancies."				SKIP TO 356 IF MALE.
354	Are you pregnant now?	YES = 1 NO = 2 DON'T KNOW/UNSURE = 8 REFUSED = 9	NO, DK, REFUSED →356	
355	How many months pregnant are you?	MONTHS _ _ DON'T KNOW / UNSURE = -8 REFUSED = -9	ALL→NEXT MODULE	
Interviewer says: "I will now ask you about family planning."				
356	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	NO →358 DK, REFUSED →SKIP TO NEXT MODULE	
357	Which method are you or your partner using? 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 = I WITHDRAWAL = J NOT HAVING SEX = K OTHER = X DON'T KNOW = Y REFUSED = Z	ALL→SKIP TO NEXT MODULE	

358	Would you like to have a/another child?	YES = 1 NO, = 2 UNDECIDED/DON'T KNOW = 3 REFUSED = 9	NO →360 UNDECIDED/DK, REFUSED →SKIP TO NEXT MODULE.
359	How long would you like to wait before the birth of a/another child? ONLY ONE OPTION MAY BE SELECTED. FOR EXAMPLE, ANSWER ONLY IN MONTHS OR IN YEARS. CODE '96' IF LESS THAN 1 MONTH.	MONTHS ___ YEARS ___ NOW/SOON = 96 DON'T KNOW = -8 REFUSED = -9	NOW/SOON, DK, REFUSED →SKIP TO NEXT MODULE
360	Can you tell me why you are not using a method to prevent pregnancy? SELECT ALL THAT APPLY.	NOT MARRIED/NO PARTNER = A NOT HAVING SEX = B INFREQUENT SEX = C MENOPAUSAL/HYSTERECTOMY = D (PARTNER) CANNOT GET PREGNANT = E NOT MENSTRUATED SINCE LAST BIRTH = F BREASTFEEDING = G UP TO GOD = H RESPONDENT OPPOSED = I HUSBAND/PARTNER OPPOSED = J RELIGION PROHIBITS= K KNOWS NO METHOD = L KNOWS NO SOURCE = M SIDE EFFECTS/HEALTH CONCERNS = N LACK OF ACCESS/TOO FAR = O COSTS TOO MUCH = P PREFERRED METHOD NOT AVAILABLE = Q NO METHOD AVAILABLE = R INCONVENIENT TO USE = S INTERFERES WITH BODY'S NORMAL PROCESSES = T OTHER = X	

		DON'T KNOW = Y REFUSED = Z	

MODULE 3A CHILDREN			
I am going to ask you a number of questions about your child/children regarding their health and where they get their health services. We will ask you about these children: [LIST OF CHILDREN] [LINE NUMBER] [CHILD'S NAME]			
3001	CHECK HOUSEHOLD SCHEDULE TO GET NUMBER OF CHILDREN 0-14 YEARS. IF NONE RECORD '00'	NUMBER OF CHILDREN __ __	IF 00 → SKIP TO NEXT MODULE

3002	ENTER THE LINE NUMBER OF THE CHILD FROM THE HOUSEHOLD LISTING	_____	
3003	What is the child's name?	_____	
3004	How old was **(NAME)** at his/her last birthday? ONLY ONE OPTION MAY BE SELECTED. FOR EXAMPLE, ANSWER ONLY IN YEARS OR IN MONTHS. CODE '00' IF LESS THAN ONE MONTH.	MONTHS ___ = -8= -9YEARS ___ = -9 DON'T KNOW = -8 REFUSED = -9	
3005	Is (**NAME**) a boy or girl?	BOY = 1 GIRL = 2 DON'T KNOW = 8 REFUSED = 9	

3006	Is **(NAME)** currently enrolled in school?	YES = 1 NO, CURRENTLY NOT IN SCHOOL = 2 NO, TOO YOUNG TO BE IN SCHOOL = 3 DON'T KNOW = 8 REFUSED = 9	NO, CURRENTLY NOT IN SCHOOL→3009 NO, TOO YOUNG, DK, REFUSED →3012
3007	During the last school week, did **[NAME]** miss any school days for any reason?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	
3008	What class/form/year is **[NAME]** in now?	CLASS/FORM/YEAR _____ DON'T KNOW = -8 REFUSED = -9	ALL → 3012
3009	Was **[NAME]** enrolled in school during the previous school year?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	NO →3011 DK, REFUSED →3012
3010	What class/form/year was **[NAME]** during the previous school year?	CLASS/FORM/YEAR _____ DON'T KNOW = -8 REFUSED = -9	ALL→3012
3011	What is the highest class/form/year that **[NAME]** has completed?	CLASS/FORM/YEAR _____ DON'T KNOW = -8 REFUSED =99	
3012	Is (**NAME**) circumcised? Circumcision is the complete removal of the foreskin from the penis. I have a picture to show you what a completely circumcised penis looks like.	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	NO →3015 DK, REFUSED → 3016 SKIP IF FEMALE CHILD. ELECTRIC AID IF DON'T KNOW

3013	How old was (**NAME**) when he was circumcised? Please give your best guess ONLY ONE OPTION MAY BE SELECTED. FOR EXAMPLE, ANSWER ONLY IN YEARS OR IN MONTHS. CODE '00' IF LESS THAN ONE MONTH. .	MONTHS ____ YEARS ____ DON'T KNOW YEAR= -8 REFUSED YEAR= -9	SKIP IF FEMALE CHILD.
3014	Who circumcised (**NAME**)?	DOCTOR, CLINICAL OFFICER, OR NURSE = 1 TRADITIONAL PRACTITIONER / CIRCUMCISER =2 MIDWIFE = 3 OTHER = 96 DON'T KNOW = 8 REFUSE TO ANSWER=9	ALL→3016 SKIP IF FEMALE CHILD.
3015	Are you planning to have **(NAME)** circumcised in the future?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	SKIP IF FEMALE CHILD.
3016	Has **(NAME)** seen a doctor, clinical officer or nurse in a health facility in the last 12 months?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED →3018
3017	During any of **(NAME)**'s visits to the health facility in the last 12 months, did a doctor, clinical officer or nurse offer **(NAME)** an HIV test?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	
3018	Has (**NAME**) ever been tested for HIV?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	YES →3020 DK, REFUSED →3044
3019	Why has **(NAME)** never been tested for HIV? SELECT ALL THAT APPLY.	DON'T KNOW WHERE TO TEST = A TEST COSTS TOO MUCH = B TRANSPORT COSTS TOO	ALL->3044

		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 CHILD HAS HIV = I CANNOT GET TREATMENT FOR HIV = J TEST KITS NOT AVAILABLE = K RELIGIOUS REASONS = L OTHER = X DON'T KNOW = Y REFUSED = Z	
3020	You said earlier that **(NAME)** had been tested for HIV. Was that the last time **(NAME)** was tested for HIV?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	SKIP IF NOT CHILD FROM REPRO MODULE,. SKIP IF NOT TESTED FOR HIV IN REPRO MODULE.
3021	What month and year was **(NAME)'s** most recent HIV test done?	MONTH ___ ___ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR ___ ___ ___ ____ DON'T KNOW YEAR = -998 REFUSED YEAR = -999	SKIP IF NOT CHILD FROM REPRO MODULE,. SKIP IF NOT TESTED FOR HIV IN REPRO MODULE.
3022	You mentioned earlier that **(NAME)** received an HIV positive result. What was the month and year of his/her first HIV positive test result? Please give your best guess. This will be the very first HIV positive test result that (NAME) had received.	MONTH ___ ___ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR ___ ___ ___ ____ DON'T KNOW YEAR = -998 REFUSED YEAR = -9	SKIP IF NOT CHILD FROM REPRO MODULE. SKIP IF NOT TESTED FOR HIV IN REPRO MODULE. SKIP IF NOT HIV POSITIVE.

	PROBE TO VERIFY DATE.		
3023	What month and year was **(NAME)**'s most recent HIV test done?	MONTH _____ DON'T KNOW MONTH = -8 REFUSED MONTHS = -9 YEARS _____ DON'T KNOW YEAR = -898 REFUSED YEAR= -999	
3024	What was (**NAME**)'s last HIV test result?	POSITIVE = 1 NEGATIVE = 2 UNKNOWN/INDETERMINATE = 3 DID NOT RECEIVE RESULTS = 4 DON'T KNOW = 8 REFUSED = 9	NEG, UNK/INDET, DID NOT RECEIVE, DK, REFUSED→ 3044 SKIP LAST TEST WAS FROM REPRO MODULE.
3025	Has (**NAME**) ever received HIV medical care from a doctor, clinical officer or nurse?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	YES → 3027 DK, REFUSED →3030
3026	What is the main reason why (**NAME**) has never seen a doctor, clinical officer or nurse for HIV medical care?	FACILITY IS TOO FAR AWAY = 1 I DON'T KNOW WHERE TO GET HIV MEDICAL CARE FOR CHILD = 2 COST OF CARE = 3 COST OF TRANSPORT = 4 I DON'T THINK CHILD NEEDS IT, HE/SHE IS NOT SICK = 5 I FEAR PEOPLE WILL KNOW THAT CHILD HAS HIV IF I TAKE HIM/HER TO A CLINIC = 6 RELIGIOUS REASONS = 7 CHILD IS TAKING TRADITIONAL MEDICINE = 8	ALL→3030 ADAPT RESPONSES TO LOCAL CONTEXT. ADAPT HEALTHCARE TERMS BSED ON LOCAL CONTEXT.

		OTHER = 96 DON'T KNOW = -8 REFUSED = -9	
3027	What month and year did (**NAME**) first see a doctor, clinical officer or nurse for HIV medical care? PROBE TO VERIFY DATE.	MONTH _____ DON'T KNOW MONTH = -8 REFUSED MONTH= -9 YEAR _____ DON'T KNOW YEAR =9998 REFUSED = -999	
3028	What month and year did (**NAME**) last see a doctor, clinical officer or nurse for HIV medical care?	MONTH _____ DON'T KNOW MONTH = -8 REFUSED MONTH= -9 YEAR _____ DON'T KNOW YEAR =9998 REFUSED = -999	IF <7 MONTHS, DK, REFUSED, MISSING DATE →3030
3029	What is the main reason for (**NAME**) not seeing a doctor, clinical officer or nurse for HIV medical care for more than 6 months?	FACILITY IS TOO FAR AWAY = 1 I DON'T KNOW WHERE TO GET HIV MEDICAL CARE FOR CHILD = 2 COST OF CARE = 3 COST OF TRANSPORT = 4 I DON'T THINK CHILD NEEDS IT, HE/SHE IS NOT SICK = 5 I FEAR PEOPLE WILL KNOW THAT CHILD HAS HIV IF I TAKE HIM/HER TO A CLINIC = 6 RELIGIOUS REASONS = 7 **CHILD** IS TAKING TRADITIONAL MEDICINE = 8 NO APPOINTMENT SCHEDULED/DID NOT MISS MOST RECENT APPOINTMENT = 9 OTHER = 96 DON'T KNOW = -8 REFUSED = -9	

3030	Has (**NAME**) ever had a CD4 count test? The CD4 count tells you how sick you are with HIV and if you need to take ARVs or other HIV medications.	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED → 3032 NO, DK, REFUSED & NEVER IN HIV CARE →3044
3031	What month and year was **(NAME)** last tested for his/her CD4 count?	MONTH ___ ___ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR ___ ___ ___ ___ DON'T KNOW YEAR = -998 REFUSED YEAR = -999	SKIP TO 3044 IF NEVER IN HIV CARE
3032	Has (**NAME**) ever taken ARVs, that is, antiretroviral medications, to treat his/her HIV infection?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	YES → 3034 DK, REFUSED → 3039 ELECTRONIC AID IF DON'T KNOW.
3033	What is the main reason (**NAME**) has never taken ARVs?	CHILD IS NOT ELIGIBLE FOR TREATMENT=1 HEALTH CARE PROVIDER DID NOT PRESCRIBE = 2 HIV MEDICINES NOT AVAILABLE = 3 DO NOT THINK CHILD NEEDS IT, HE/SHE IS NOT SICK = 4 COST OF MEDICATIONS = 5 COST OF TRANSPORT = 6 RELIGIOUS REASONS = 7 CHILD IS TAKING TRADITIONAL MEDICATIONS = 8 OTHER = 96 DON'T KNOW = -8 REFUSED = -9	ALL→SKIP TO 3039
3034	What month and year did (**NAME**) first start taking ARVs?	MONTH = ____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9	

	PROBE TO VERIFY DATE.	YEAR = ____ DON'T KNOW YEAR = -998 REFUSED YEAR = -999	
3035	What month and year did **(NAME)** last receive ARVs?	MONTH = ____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR = ____ DON'T KNOW YEAR = -998 REFUSED YEAR = -999	
3036	Is (**NAME**) currently taking ARVs, that is, antiretroviral medications? By currently, I mean that **(NAME)** may have missed some doses but **(NAME)** is still taking ARVs.	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	YES → 3038 DK, REFUSED →3039
3037	Can you tell me the main reason why (**NAME**) is not currently taking ARVs?	I HAVE TROUBLE GIVING CHILD A TABLET EVERYDAY = 1 CHILD HAD SIDE EFFECTS/RASH = 2 FACILITY/PHARMACY TOO FAR AWAY TO GET MEDICATION REGULARLY = 3 COST OF MEDICATIONS = 4 COST OF TRANSPORT = 5 CHILD IS HEALTHY/, HE/SHE IS NOT SICK = 6 FACILITY WAS OUT OF STOCK = 7 RELIGIOUS REASONS = 8 CHILD IS TAKING TRADITIONAL MEDICATIONS = 9 OTHER =96 DON'T KNOW = -8 REFUSED = -9	ALL→SKIP TO 3039

3038	People sometimes forget to take all of their ARVs everyday. In the last 30 days, how many days has (**NAME**) missed taking any ARV pills? CODE '00' FOR NONE.	DAYS ___ ___ DON'T KNOW = -8 REFUSED = -9	
3039	Is (**NAME**) currently taking Bactrim or cotrimoxazole? Bactrim or cotrimoxazole is a medicine recommended for people with HIV, even if they have not started treatment for HIV. It helps prevent certain infections but it is not treatment for HIV. By currently, I mean that **(NAME)** may have missed some doses but is still taking Bactrim.	YES = 1 NO = 2 I DON'T KNOW WHAT IT IS = 3 REFUSED = 9	YES, DK, REFUSED → 3041 ELECTRONIC AID IF DON'T KNOW
3040	Can you tell me the main reason why (**NAME**) is not <u>currently</u> taking Bactrim or Cotrimoxazole daily?	NOT PRESCRIBED = 1 I HAVE TROUBLE GIVING CHILD A TABLET EVERYDAY = 2 CHILD HAD SIDE EFFECTS/RASH = 3 FACILITY/PHARMACY TOO FAR AWAY TO GET BACTRIM OR COTROMOXIAZOLE REGULARLY = 4 CHILD DOES NOT NEED IT, HE/SHE IS NOT SICK = 5 PHARMACY/ FACILITY WAS OUT OF STOCK = 6 COST OF MEDICATIONS = 7 COST OF TRANSPORT =8 DOCTOR SAID NO LONGER NEEDED = 9 OTHER =96 I DON'T KNOW = -8 REFUSED = -9	

3041	At the last HIV medical care visit, did a doctor clinical officer or nurse ask if: - (**NAME**) had any of the following tuberculosis or TB symptoms: cough, fever, night sweats, and weight loss <u>OR</u> - if (**NAME**) had contact with someone who had tuberculosis or TB?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	SKIP IF NOT IN HIV CARE
3042	In the last 12 months, has **(NAME)** experienced these TB symptoms or had contact with someone with TB?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED →3044 SKIP IF NOT IN HIV CARE
3043	In the last 12 months, did **(NAME)** receive a chest x-ray or sputum test to look for tuberculosis or TB? A sputum test is when the patient has to cough and collect the sample in a cup. SELECT ALL THAT APPLY.	CHEST X-RAY = A SPUTUM TEST = B NONE OF THESE = C DON'T KNOW = Y REFUSED = Z	SKIP IF NOT IN HIV CARE
3044	Has (**NAME**) ever visited a tuberculosis or TB clinic for TB diagnosis or treatment?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	IF NO, DK, REFUSED → 3050

3045	Was (**NAME**) tested for HIV at the TB clinic?	YES = 1 NO, WAS NOT TESTED FOR HIV = 2 NO, WAS ALREADY HIV POSITIVE = 3 DON'T KNOW = 8 REFUSED = 9	
3046	Have you ever been told by a doctor, clinical officer or nurse that (**NAME**) had TB?	YES = 1 NO=2 DON'T KNOW = 8 REFUSED = 9	IF NO,DK, REFUSED → 3050
3047	What month and year did a doctor, clinical officer or nurse diagnose (**NAME**) with TB? RECORD THE MOST RECENT TIME IF DIAGNOSED WITH TB MORE THAN ONCE.	MONTH ___ ___ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR __ __ __ __ DON'T KNOW YEAR = -998 REFUSED YEAR = -999	
3048	Was (**NAME**) ever treated for TB?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	IF NO, DK, REFUSED → 3050
3049	The last time **(NAME)** was treated for TB, did **(NAME)** complete at least 6 months of treatment?	YES = 1 NO, THE MEDICINE WAS STOPPED IN LESS THAN 6 MONTHS = 2 NO, CHILD IS STILL ON TREATMENT = 3 DON'T KNOW = 8 REFUSED = 9	
3050	Thank you for the information about **(NAME)**. DOES THE RESPONDENT HAVE	YES = 1 NO = 2	YES→RETURN TO 3002

	ANOTHER CHILD AGED 0-14 YEARS?		

MODULE 4: MALE CIRCUMCISION			
Interviewer says: "I will be asking a few questions about circumcision. Circumcision is the complete removal of the foreskin from the penis. I have a picture to show you what a completely circumcised penis looks like."			
401	Does male circumcision alone reduce the risk, or chance, of a man getting HIV completely, somewhat or not at all?	PROTECTS COMPLETELY = 1 PROTECTS SOMEWHAT = 2 NOT AT ALL = 3 DON'T KNOW = 4 REFUSED = 9	
402	Do you agree or disagree with the following statement: Men who are circumcised do not need to use condoms to protect themselves from HIV	AGREE = 1 DISAGREE = 2 UNSURE/DON'T KNOW = 3REFUSED = 9	
403	Do you agree or disagree with the following statement: Men who are circumcised can have multiple sexual partners and not be at risk for HIV.	AGREE = 1 DISAGREE = 2 UNSURE/DON'T KNOW = 3 REFUSED = 9	SKIP TO NEXT MODULE IF FEMALE.
404	Many men do not want to talk about circumcision, but it is important for us to have this information. Some men are circumcised. Are you circumcised?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED=9	YES → 406 DK, REFUSED → SKIP TO NEXT MODULE
405	Are you planning to get circumcised?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED=9	ALL→SKIP TO NEXT MODULE
406	How old were you when you were circumcised? Please give your best guess. IF LESS THAN ONE YEAR, CODE '00'.	AGE IN YEARS ____ DON'T KNOW = -8 REFUSED=-9	

407	Who did the circumcision?	DOCTOR, CLINICAL OFFICER, OR NURSE = 1 TRADITIONAL PRACTITIONER / CIRCUMCISER =2 MIDWIFE = 3 OTHER = 96 DON'T KNOW = 8 REFUSED=9	

MODULE 5: SEXUAL ACTIVITY			
Interviewer says: "In this part of the interview, I will be asking questions about your sexual relationships and practices. These questions will help us have a better understanding of how they may affect your life and risk for HIV. **Let me assure you again that your answers are completely confidential and will not be shared with anyone. If there are questions that you do not want to answer, we can go to the next question."**			
501	If you wanted a condom, would it be easy for you to get one?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	YES, DK, REFUSED → 503
502	Why is it not easy for you to get a condom? SELECT ALL THAT APPLY.	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 OTHER = X DON'T KNOW = Y REFUSED = Z	

MODULE 5: SEXUAL ACTIVITY			
503	How old were you when you had vaginal sex for the very first time? Vaginal sex is when a penis enters a vagina.	AGE IN YEARS _ _ NEVER HAD VAGINAL SEX = 96 DON'T KNOW = -8 REFUSED = -9	
504	People have sex in different ways. Some have vaginal sex. Some have anal sex. Anal sex is when a penis enters a person's anus. Have you ever had anal sex?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED →506 NEVER VAGINAL OR ANAL SEX→NEXT MODULE
505	How old were you when you had anal sex for the very first time?	AGE IN YEARS _ _DON'T KNOW = -8 REFUSED = -9	
506	The first time you had vaginal or anal sex, was a condom used?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	
507	The first time you had vaginal or anal sex, was it because you wanted to or because you were forced to?	WANTED TO = 1 FORCED TO = 2 DON'T KNOW = 8 REFUSED = 9	WANTED, DK, REFUSED →509
508	The first time you had vaginal or anal sex, were you physically forced or were you pressured into having sex through harassment, threats or tricks?	PHYSICALLY FORCED = 1 PRESSURED = 2 DON'T KNOW = 8 REFUSED = 9	
509	People often have sex with different partners over their lifetime. In total, with how many different people have you had sex in the last 12 months? IF NONE CODE '00'.	NUMBER OF SEXUAL PARTNERS IN LAST 12 MONTHS __ __ __ DON'T KNOW = -98 REFUSED = -99	IF 00 PARTNERS IN LAST 12 MONTHS → 532

MODULE 5: SEXUAL ACTIVITY			
	IF NUMBER OF SEXUAL PARTNERS IS GREATER THAN 100, WRITE ' 100'.		

Interviewer says: "Now I would like to ask you some questions about the partners you have had sex with in the last 12 months. Let me assure you again that your answers are completely confidential and will not be told to anyone. I will first ask you about your most recent partner."

510	I would like to ask you for the initials of your partner so I can keep track. They do not have to be the actual initials of your partner.	INITIALS ____ ____	
511	Does (INITIALS) live in this household?	YES = 1 NO = 2 NO→513	
512	HOUSEHOLD LINE NO. for (INITIALS) CODE '00' IF NOT LISTED IN HOUSEHOLD ROSTER.	LINE NO_____	
513	What is your relationship with (INITIALS)?	HUSBAND/WIFE = 1 LIVE-IN PARTNER = 2 PARTNER, NOT LIVING WITH RESPONDENT = 3 EX-SPOUSE/PARTNER = 4 FRIEND/ACQUAINTANCE = 5 SEX WORKER = 6 SEX WORKER CLIENT =7 STRANGER = 8 OTHER = 96 DON'T KNOW = -8 REFUSED = -9	

514	How long has it been since you <u>last</u> had sex with (INITIALS)? IF LESS THAN ONE WEEK RECORD IN DAYS, IF LESS THAN ONE MONTH, RECORD IN WEEKS, OTHERWISE RECORD IN MONTHS.	DAYS _ _ WEEKS _ _ MONTHS _ _ DON'T KNOW = -8 REFUSED = -9	
515	How long has it been since you <u>first</u> had sex with (INITIALS)? IF LESS THAN ONE WEEK RECORD IN DAYS, IF LESS THAN ONE MONTH, RECORD IN WEEKS. IF LESS THAN ONE YEAR, RECORD IN MONTHS. OTHERWISE RECORD IN YEARS.	DAYS = _ _ WEEKS = _ _ MONTHS = _ _ YEARS = _ _ DON'T KNOW = -8 REFUSED = -9	
516	Is **(INITIALS)** male or female?	MALE = 1 FEMALE = 2 DON'T KNOW = 8 REFUSED = 9	
517	How old is (**INITIALS)**? Please give your best guess.	AGE IN YEARS ____ DON'T KNOW =98 REFUSED = -9	
518	The <u>last</u> time you had sex with (INITIALS) was a condom used?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	
519	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	

520	In the last 12 months, how often did you use condoms with (INITIALS) when having vaginal sex? Was it always, most of the time, sometimes, rarely or never?	ALWAYS = 1 MOST OF THE TIME = 2 SOMETIMES = 3 RARELY = 4 NEVER = 5 NO VAGINAL SEX IN THE LAST 12 MONTHS = 3 DON'T KNOW = 8 REFUSED = 9 SKIP IF NEVER HAD VAGINAL SEX.	
521	In the last 12 months, how often did you use condoms with (INITIALS) when having anal sex? Was it always, most of the time, sometimes, rarely or never?	ALWAYS = 1 MOST OF THE TIME = 2 SOMETIMES = 3 RARELY = 4 NEVER = 5 NO ANAL SEX IN THE LAST 12 MONTHS = 6 DON'T KNOW = 8 REFUSED = 9 SKIP IF NEVER HAD ANAL SEX.	.
522	In the last 12 months, when you had sex with (INITIALS), did the condom you were using ever break, leak or slip off during sex or while pulling out?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9 SKIP IF NEVER USED CONDOM	
523	Did you enter into a sexual relationship with (INITIALS) because (INITIALS) provided you with or you expected that (INITIALS) would provide you with material support or help you in other ways? Material support means helping you to pay for things, or giving you	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9 NO, DK, REFUSED → 525,	

	gifts or other items you needed or requested.	SKIP IF SEX WORKER OR CLIENT	
524	In the last 12 months, what all did you receive? SELECT ALL THAT APPLY.	DID NOT RECEIVE ANYTHING = A MONEY = B FOOD = C SCHOOL FEES = D EMPLOYMENT = E GIFTS/FAVORS = F TRANSPORT = G SHELTER/RENT = H PROTECTION = I OTHER = X DON'T KNOW = Y REFUSED = Z SKIP IF SPOUSE, LIVE-IN PARTNER SEX WORKER OR CLIENT	
525	Was (INITIALS) circumcised?	YES =1 NO =2 DON'T KNOW = 8 REFUSED = 9 SKIP IF PARTNER NOT MALE.	.
526	Do you expect to have sex with (INITIALS) again?	YES =1 NO =2 DON'T KNOW = 8 REFUSED = 9	
527	Have you ever taken an HIV test with (INITIALS)?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9 YES, DK, REFUSED → 529	

528	What is the main reason you have never tested for HIV with (INITIALS) as a couple? READ RESPONSES ALOUD.	NOT A PARTNER/COUPLE= 1 NEVER DISCUSSED = 2 WE ARE NOT AT RISK FOR HIV = 3 PARTNER REFUSED = 4 I REFUSED = 5 WE KNOW OUR STATUS = 6 OTHER = 96 DON'T KNOW = -8 REFUSED = -9	
529	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	
530	What is the HIV status of (INITIALS)? READ RESPONSES ALOUD.	THINK (INITIALS) IS POSITIVE = 1 (INTIALS) TOLD ME HE/SHE IS POSITIVE = 2 POSITIVE, TESTED TOGETHER = 3 THINK (INITIALS) IS NEGATIVE = 4 (INITIALS) TOLD ME HE/SHE IS NEGATIVE = 5 NEGATIVE, TESTED TOGETHER=6 DON'T KNOW STATUS = 7 REFUSED = 9	
531	DOES THE RESPONDENT HAVE ANOTHER PARTNER IN THE LAST 12 MONTHS?	YES = 1 NO = 2 YES → RETURN TO 510 I will now ask about your second to last partner.	.

Interviewer says: "Now I am going to ask you some additional questions about your sexual activities. Again, I am asking that you answer these questions honestly. Let me assure you again that your answers are completely confidential and will not be shared with anyone."

532	Have you ever sold sex for money?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED → 535
533	In the last 12 months, have you sold sex for money?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED →535
534	The last time you sold sex for money, was a condom used?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	
535	Have you ever paid money for sex?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED → NEXT MODULE
536	In the last 12-months, have you paid money for sex?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED →NEXT MODULE
537	The last time you paid money for sex, was a condom used?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	

MODULE 6: HIV/AIDS KNOWLEDGE AND ATTITUDES			
Interviewer says: "Now I will ask you questions on your knowledge of HIV."			
601	Can the risk of HIV transmission be reduced by having sex with only one uninfected partner who has no other partners?	YES = 1 NO = 2 DON'T KNOW = 3 REFUSED = 9	

602	Can a person get HIV from mosquito bites?	YES = 1 NO = 2 DON'T KNOW = 3 REFUSED = 9	
603	Can a person reduce their risk of getting HIV by using a condom every time they have sex?	YES = 1 NO = 2 DON'T KNOW = 3 REFUSED = 9	
604	Can a person get HIV by sharing food with someone who has HIV?	YES = 1 NO = 2 DON'T KNOW = 3 REFUSED = 9	
605	Can a healthy-looking person have HIV?	YES = 1 NO = 2 DON'T KNOW = 3 REFUSED = 9	
Interviewer says: "Now I would like to ask you some questions about people's attitudes towards people living with HIV."			
606	Would you buy fresh vegetables from a shop keeper or vendor if you knew the person had HIV?	YES = 1 NO = 2 DON'T KNOW/NOT SURE/DEPENDS = 8 REFUSED = 9	
607	Do you think children living with HIV should be allowed to attend school with children who do not have HIV?	YES = 1 NO = 2 DON'T KNOW/NOT SURE/DEPENDS = 8 REFUSED = 9	
608	Do you think people hesitate to take an HIV test because they are afraid of how other people will react if the test result is positive for HIV?	YES = 1 NO = 2 DON'T KNOW/NOT SURE/DEPENDS = 8 REFUSED = 9	

609	Do people talk badly about people living with HIV, or who are thought to be living with HIV?	YES = 1 NO = 2 DON'T KNOW/NOT SURE/DEPENDS = 8 REFUSED = 9	
610	Do people living with HIV, or thought to be living with HIV, lose the respect of other people?	YES = 1 NO = 2 DON'T KNOW/NOT SURE/DEPENDS = 8 REFUSED = 9	
611	Do you fear that you could get HIV if you come into contact with the saliva of a person living with HIV?	YES = 1 NO =2 ALREADY HAS HIV = 3 DON'T KNOW/NOT SURE/DEPENDS =8 REFUSED = 9	
612	Do you agree or disagree with the following statement: I would be ashamed if someone in my family had HIV.	AGREE = 1 DISAGREE = 2 DON'T KNOW/NOT SURE/DEPENDS = 8 REFUSED = 9	

MODULE 7: HIV TESTING			
Interviewer says: "I would now like to ask you some questions about HIV testing."			
701	Have you seen a doctor, clinical officer or nurse in a health facility in the last 12 months?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED → 703 .
702	During any of your visits to the health facility in the last 12 months, did a doctor, clinical officer or nurse offer you an HIV test?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	
703	Have you <u>ever</u> **tested** for HIV?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	YES, DK, REFUSED → 705

704	Why have you never been tested for HIV? SELECT ALL THAT APPLY.	DON'T KNOW WHERE TO TEST = A TEST COSTS TOO MUCH = B TRANSPORT COSTS TOO MUCH = C TOO FAR AWAY = D AFRAID OTHERS WILL KNOW ABOUT TEST RESULTS = E DON'T NEED TEST/LOW RISK = F DID NOT RECEIVE PERMISSION FROM SPOUSE/FAMILY = G AFRAID SPOUSE/PARTNER/FAMILY WILL KNOW RESULTS = H DON'T WANT TO KNOW I HAVE HIV = I CANNOT GET TREATMENT FOR HIV = J TEST KITS NOT AVAILABLE = K RELIGIOUS REASONS = L OTHER = X DON'T KNOW = Y REFUSED = Z	
705	If an HIV self-test kit were available in this country, would you use it? With a self-test kit you can test yourself for HIV at home. There are instructions on how to interpret the results.	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	IF NEVER TESTED → SKIP TO NEXT MODULE
706	Have you had an HIV test since giving birth to **(NAME)**?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	YES→709 DK, REFUSED →712 SKIP IF NO LAST BIRTH IN THE LAST 3 YEARS. SKIP IF NOT TESTED FOR HIV IN REPRO MODULE.

			SKIP IF MALE.
707	What month and year did you last test for HIV while you were pregnant with **(NAME)**?	MONTH ___ ___ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR ___ ___ ___ ____ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	SKIP IF NO LAST BIRTH IN THE LAST 3 YEARS. SKIP IF NOT TESTED FOR HIV IN REPRO MODULE. SKIP IF MALE.
708	You mentioned earlier you received an HIV positive result while you were pregnant with **(NAME)**. What was the month and year of your first HIV positive test result? Please give your best guess. This will be the very first HIV positive test result that you have received PROBE TO VERIFY DATE.	MONTH ___ ___ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR ___ ___ ___ ____ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	ALL RESPONSES →713 SKIP IF HIV NEGATIVE DURING PREGNANCY WITH (NAME). SKIP IF NO LAST BIRTH IN THE LAST 3 YEARS. SKIP IF MALE.
709	What month and year was your last HIV test?	MONTHS _____ _____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR ____ DON'T KNOW YEAR= -998 REFUSED YEAR = -999	
710	Where was the <u>last</u> test done?	VCT FACILITY = 1 MOBILE VCT = 2 AT HOME = 3 HEALTH CLINIC / FACIITY = 4 HOSPITAL OUTPATIENT CLINIC = 5 TB CLINIC = 6 STI CLINIC = 7	

		HOSPITAL INPATIENT WARDS = 8 BLOOD DONATING CENTER = 9 OTHER = 96 DON'T KNOW = -8 REFUSED = -9	
711	What was the result of that HIV test?	POSITIVE = 1 NEGATIVE = 2 UNCERTAIN/INDETERMINATE = 3 DID NOT RECEIVE THE RESULT = 4 DON'T KNOW = 8 REFUSED = 9	NEG, UNCERT/INDET, NO RESULT, DK, REFUSED →SKIP TO NEXT MODULE.
712	What was the month and year of your first HIV positive test result? Please give your best guess. This will be the very first HIV positive test result that you have received PROBE TO VERIFY DATE.	MONTH ___ ___ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR ___ ___ ___ ____ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	
713	Of the following people, who have you told that you are HIV positive? CHECK ALL THAT APPLY.	NO ONE = A SPOUSE/SEX PARTNER = B DOCTOR = C FRIEND = D FAMILY MEMBER = E OTHER = X DON'T KNOW = Y REFUSED = Z	SKIP TO NEXT QUESTION IF NO ONE. SKIP IF HIV NEGATIVE.
Interviewer says: "Now I would like to ask you questions about your experiences with health care providers."			

714	In the last 12 months, have health care providers talked badly about you because of your HIV status?	YES = 1 NO = 2 NO ONE KNOWS MY STATUS = 3 DON'T KNOW = 8 REFUSED = 9	
715	In the last 12 months, when you sought health care in a facility where your HIV status is not known, did you feel you needed to hide your HIV status?	YES = 1 NO, NO NEED TO HIDE = 2 NO, DID NOT ATTEND HEALTH FACILITY IN LAST 12 MONTHS =3 DON'T KNOW = 8 REFUSED = 9	
716	In the last 12 months, have you been denied health services including dental care, because of your HIV status?	YES = 1 NO = 2 NO ONE KNOWS MY STATUS = 3 DON'T KNOW = 8 REFUSED = 9	

MODULE 8: HIV STATUS, CARE AND TREATMENT			
Interviewer says: "Now I'm going to ask you more about your experience with HIV support, care and treatment."			
801	After learning you had HIV, have you <u>ever</u> received HIV medical care from a doctor, clinical officer or nurse?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	YES → 803 DK, REFUSED → SKIP TO NEXT MODULE
802	What is the <u>main</u> reason why you have never received HIV medical care from a doctor, clinical officer or nurse?	FACILITY IS TOO FAR AWAY = 1 I DON'T KNOW WHERE TO GET HIV MEDICAL CARE = 2 COST OF CARE = 3 COST OF TRANSPORT = 4 I DO NOT NEED IT/I FEEL HEALTHY/NOT SICK = 5 I FEAR PEOPLE WILL KNOW THAT I HAVE HIV IF I GO TO A CLINIC = 6	ALL→ 808

		RELIGIOUS REASONS =7 I'M TAKING TRADITIONAL MEDICINE= 8 OTHER = 96 DON'T KNOW = -8 REFUSED = -9	
803	What month and year did you <u>first</u> see a doctor, clinical officer or nurse for HIV medical care? PROBE TO VERIFY DATE.	MONTH ___ ___ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR ___ ___ ___ ____ DON'T KNOW YEAR = -998 REFUSED YEAR = -999	
804	What month and year did you <u>last</u> see a doctor, clinical officer or nurse for HIV medical care?	MONTH ___ ___ DON'T KNOW MONTH = -8 REFUSED MONTH= -9 YEAR ___ ___ ___ ____ DON'T KNOW YEAR =9998 REFUSED = -999	IF <7 MONTHS, DK, REFUSED →806
805	What is the <u>main</u> reason for not seeing a doctor, clinical officer or nurse for HIV medical care for more than 6 months?	FACILITY IS TOO FAR AWAY = 1 I DON'T KNOW WHERE TO GET HIV MEDICAL CARE = 2 COST OF CARE = 3 COST OF TRANSPORT = 4 I DO NOT NEED IT/I FEEL HEALTHY/NOT SICK = 5 I FEAR PEOPLE WILL KNOW THAT I HAVE HIV IF I GO TO A CLINIC = 6 RELIGIOUS REASONS = 7 I'M TAKING TRADITIONAL MEDICINE= 8 NO APPOINTMENT	

		SCHEDULED/DID NOT MISS MOST RECENT APPOINTMENT = 9 OTHER = 96 DON'T KNOW = -8 REFUSED = -9	
806	At your last HIV care visit, approximately how long did it take you to travel from your home (or workplace) one way?	LESS THAN ONE HOUR = 1 ONE TO TWO HOURS = 2 MORE THAN TWO HOURS = 3 DON'T KNOW = 8 REFUSED = 9	
807	At your last HIV care visit, approximately how much did it cost to travel from your home (or workplace) one way?	COST _____ DON'T KNOW = -998 REFUSED = -999	
808	Have you ever had a CD4 count test? The CD4 count tells you how sick you are with HIV and if you need to take ARVs or other HIV medications.	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED → 810 NO, DK, REFUSED & NEVER IN HIV CARE → SKIP TO END OF MODULE
809	What month and year were you last tested for your CD4 count?	MONTH ___ ___ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR ___ ___ ___ ____ DON'T KNOW YEAR = -998 REFUSED YEAR = -999	SKIP TO END OF MODULE IF NEVER IN HIV CARE.
810	Have you <u>ever</u> taken ARVs, that is, antiretroviral medications to treat HIV infection?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	YES → 812 DK, REFUSED →817
811	What is the main reason you have never taken ARVs?	NOT ELIGIBLE FOR TREATMENT=1 HEALTH CARE PROVIDER DID NOT PRESCRIBE = 2	ALL→817

		HIV MEDICINES NOT AVAILABLE = 3 I FEEL HEALTHY/NOT SICK = 3 COST OF MEDICATIONS = 4 COST OF TRANSPORT = 5 RELIGIOUS REASONS = 6 TAKING TRADITIONAL MEDICATIONS = 7 NOT ATTENDING HIV CLINIC = 8 OTHER = 96 DON'T KNOW = -8 REFUSED = -9	
812	What month and year did you <u>first</u> start taking ARVs? PROBE TO VERIFY DATE.	MONTH _____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR _____ DON'T KNOW YEAR = -998 REFUSED YEAR = -999	
813	What month and year did you <u>last</u> receive ARVs?	MONTH _____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR _____ DON'T KNOW YEAR = -998 REFUSED YEAR = -999	
814	Are you <u>currently</u> 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	YES→816 DK, REFUSED → 817
815	Can you tell me the <u>main</u> reason why you are <u>not</u> currently taking ARVs?	I HAVE TROUBLE TAKING A TABLET EVERYDAY = 1 I HAD SIDE EFFECTS = 2 FACILITY TOO FAR AWAY FOR ME TO GET MEDICINE REGULARLY = 3 COST OF MEDICATIONS = 4 COST OF TRANSPORT = 5	ALL→817

		I FEEL HEALTHY/NOT SICK =6 FACILITY WAS OUT OF STOCK = 7 RELIGIOUS REASONS = 8 TAKING TRADITIONAL MEDICATIONS = 9 OTHER=96 DON' T KNOW = -8 REFUSED = -9	
816	People sometimes forget to take all of their ARVs everyday. In the last 30 days, how many days have you missed taking any of your ARV pills ? CODE '00' IF NONE.	NUMBER OF DAYS _____ DON'T KNOW = -8 REFUSED = -9	
817	Are you <u>currently</u> taking Bactrim or cotrimoxazole? Bactrim or cotrimoxazole is a medicine recommended for people with HIV, even if they have not started treatment for HIV. It helps prevent certain infections but it is not treatment for HIV. By currently, I mean that you may have missed some doses but you are still taking Bactrim/Cotrimoxazole.	YES = 1 NO=2 DON'T KNOW = 8 REFUSED = 9	IF YES, DK, REFUSED → 819 ELECTRONIC AID IF DON'T KNOW.
818	Can you tell me the <u>main</u> reason why you are not <u>currently</u> taking Bactrim or Cotrimoxazole?	WAS NOT PRESCRIBED= 1 I HAVE TROUBLE TAKING A TABLET EVERYDAY = 2 I HAD SIDE EFFECTS/RASH = 3 FACILITY TOO FAR AWAY FOR ME TO GET BACTRIM OR COTRIMOXAZOLE REGULARLY = 4 DO NOT NEED IT/NOT SICK = 5 PHARMACY/FACILITY WAS OUT OF STOCK = 6 COST OF MEDICATIONS = 7 COST OF TRANSPORT = 8	

		DOCTOR SAID NO LONGER NEEDED = 9 OTHER=96 DON' T KNOW = -8 REFUSED = -9	
819	Have you ever attended a support group for people living with HIV?	YES= 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED → 822
820	In the last 12 months, how many times did you attend a support group? CODE '00' IF NONE.	NUMBER OF TIMES ____ DON'T KNOW = -8 REFUSED = -9	NONE, DK, REFUSED →822
821	Which of the following do you receive from the support group related to your HIV infection? READ EACH RESPONSE. SELECT ALL THAT APPLY.	NOTHING = A COUNSELING/HEALTHY LIVING MESSAGES = B REMINDED OF IMPORTANCE OF TAKING ARV REGULARLY = C REMINDED TO KEEP HIV APPOINTMENTS = D REFILLS OR PICKING UP ARV MEDICATIONS = E PSYCHOSOCIAL SUPPORT = F LIVELIHOOD/MATERIAL SUPPORT = G OTHER = X DON'T KNOW = Y REFUSED = Z	IF NOTHING →822
Now I will ask you about HIV care and tuberculosis or TB.			SKIP TO NEXT MODULE IF NOT IN HIV CARE.
822	At your last HIV medical care visit, were you asked if you had any of the following TB symptoms: cough, fever, night sweats and weight loss?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	
823	In the last 12 months, have you experienced any of the following TB symtpoms: cough, fever, night sweats and weight loss?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED → NEXT MODULE

824	In the last 12 months, did you receive a chest x-ray or sputum test to look for TB? *A sputum test is when the patient has to cough and collect the sample in a cup.* SELECTALL THAT APPLY.	CHEST X-RAY = A SPUTUM TEST = B NONE OF THESE = C DON'T KNOW = Y REFUSE = Z	

MODULE 9: TUBERCULOSIS AND OTHER HEALTH ISSUES			
Interviewer says: "Now I will ask you about tuberculosis or TB."			
901	Have you ever visited a tuberculosis or TB clinic for tuberculosis or TB diagnosis or treatment?	YES = 1 NO=2 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED → 907
902	Were you tested for HIV at the TB clinic?	YES = 1 NO, WAS NOT TESTED FOR HIV =2 NO, ALREADY HIV POSITIVE = 3 DON'T KNOW = 8 REFUSED = 9	
903	Have you ever been told by a doctor, clinical officer or nurse that you had TB?	YES = 1 NO=2 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED → 907
904	What month and year did a doctor, clinical officer or nurse tell you that you have (had) TB? RECORD THE MOST RECENT TIME IF DIAGNOSED WITH TB MORE THAN ONCE.	MONTH ___ ___ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR __ __ __ __ DON'T KNOW YEAR = -998 REFUSED YEAR = -999	

905	Were you ever treated for TB?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED → 907
906	The last time you were treated for TB, did you complete at least 6 months of treatment ?	YES = 1 NO, MEDICINE WAS STOPPED IN LESS THAN 6 MONTHS = 2 NO, BUT I AM STILL ON TREATMENT = 3 DON'T KNOW = 8 REFUSED = 9	

Interviewer says: "Now I'm 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 health care provider can do to check for cervical cancer are called a pap smear, HPV 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 A MALE.

907	Have you ever been tested for cervical cancer?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED → 912 ELECTRONIC AID IF DON'T KNOW
908	What month and year was your last test for cervical cancer?	MONTH ___ ___ DON'T KNOW MONTH = -8 REFUSED MONTH = -9 YEAR ___ ___ ___ ___ DON'T KNOW YEAR = -998 REFUSED YEAR = -999	
909	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	NORMAL, UNCLEAR, DID NOT RECEIVE, DK, REFUSED → 912

		REFUSED = 9	
910	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 REFUSED = 8 DON'T KNOW = 9	
911	Did you have any follow up visits because of your test results?	YES = 1 NO = 2 REFUSED = 8 DON'T KNOW = 9	
Interviewer says: "Now I would like to ask you questions about sexual health."			
912	During the last 12 months, have you had an abnormal discharge from your vagina or experienced pelvic pain? This may include an unusual smell, color, or texture.	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	SKIP IF MALE.
913	During the last 12 months, have you had an ulcer or sore on or near your vagina?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	SKIP IF MALE.
914	During the last 12 months, have you had an abnormal discharge from your penis?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	SKIP IF MALE.

915	During the last 12 months, have you had an ulcer or sore on or near your penis?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	SKIP IF FEMALE.
916	During the last 12 months, have you had pain on urination?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	SKIP IF FEMALE.
917	Did you see a doctor, clinical officer or nurse because of these problems?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	SKIP IF NO TO QUESTIONS ABOVE.
918	In the last 12 months, did a doctor, clinical officer or nurse tell you that you had a sexually transmitted disease other than HIV?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	
919	Did you get treatment for these problems?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED → NEXT MODULE ONLY YES TO SYMPTOMS; YES TO STD
920	Where did you go to get treatment? Did you go to a public facility, CHAM, another private facility or a pharmacy? SELECT ALL THAT APPLY.	PUBLIC CLINIC/HOSPITAL= A CHAM HOSPITAL = B OTHER PRIVATE CLINIC/HOSPITAL = C PHARMACY = D OTHER = X DON'T KNOW = Y REFUSED = Z	ONLY YES TO SYMPTOMS; YES TO STD

MODULE 10: ALCOHOL USE			
Interviewer says: "The next few questions will be on your use of alcohol. Remember, all the answers you provide will be kept confidential."			
1001	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 =	NEVER, DK, REFUSED→ NEXT MODULE.

MODULE 10: ALCOHOL USE			
		4 DON'T KNOW=8 REFUSED =9	
1002	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	
1003	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 11: GENDER NORMS

MODULE 11: GENDER NORMS			
Interviewer says: "Now I would like to ask you questions on decision-making in your home."			
1101	Who usually makes decisions about health care for yourself: you, your (spouse/partner), you and your (spouse/partner) together, or someone else?	I DO = 1 SPOUSE/PARTNER = 2 WE BOTH DO = 3 SOMEONE ELSE = 4 DON'T KNOW = 8 REFUSED = 9	SKIP IF NOT MARRIED/LIVING TOGETHER
1102	Who generally decides about how the money you receive is spent: you, your (spouse/partner), you and your (spouse/partner) together, or someone else?	I DO = 1 SPOUSE/PARTNER = 2 WE BOTH DO = 3 SOMEONE ELSE = 4 DON'T KNOW = 8 REFUSED = 9	SKIP IF NOT MARRIED/LIVING TOGETHER

1103	Do you believe it is right for a man to hit or beat his wife/partner if she goes out without telling him?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	
1104	Do you believe it is right for a man to hit or beat his wife/partner if she does not take care of the children?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	
1105	Do you believe it is right for a man to hit or beat his wife/partner if she argues with him?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	
1106	Do you believe it is right for a man to hit or beat his wife/partner if she refuses to have sex with him?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	
1107	Do you believe it is right for a man to have sex with other women if his wife/partner refuses to have sex with him?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	
1108	Do you believe a person should tolerate violence to keep the family together?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	
1109	Do you believe women who carry condoms have sex with a lot of men?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	

MODULE 12: VIOLENCE

Interviewer says: "You have been selected to be asked questions on other important aspects of a person's life. I know that some of these questions are very personal. However, your answers are important for helping to understand the condition of men and women in Malawi. Let me assure you that your answers are completely confidential and will not be told to anyone and no one in your household will know that you were asked these questions.

By sex, I mean vaginal, anal, oral sex or the insertion of an object into your vagina or anus. Vaginal sex is when a penis enters a vagina. Anal sex is when a penis enters an anus (butt). Oral sex is when a partner puts his/her mouth on his/her partner's penis or vagina."

1201	How many times has anyone ever touched you in a sexual way without your permission, but did not try and force you to have sex? Touching in a sexual way without permission includes fondling, pinching, grabbing, or touching you on or around your sexual body parts. CODE '00' IF NONE.	NUMBER OF TIMES ____ DON'T KNOW = -8 REFUSED = -9	NONE,DK, REFUSED→1203
1202	How old were you the <u>first</u> time this happened?	AGE IN YEARS ____ DON'T KNOW = -8 REFUSED = -9	
1203	How many times in your life has anyone <u>tried</u> to make you have sex against your will but did not succeed? This includes someone using harassment, threats, tricks, or physical force. CODE '00' IF NONE.	NUMBER OF TIMES ____ DON'T KNOW = -8 REFUSED = -9	NONE, DK, REFUSED→1205
1204	How old were you the <u>first</u> time someone <u>tried</u> to make you have sex against your will but did not succeed?	AGE IN YEARS ____ DON'T KNOW = -8 REFUSED = -9	
1205	How many times in your life have you been <u>physically forced</u> to have	NUMBER OF TIMES ____ DON'T KNOW = -8	NONE, DK, REFUSED→1213

	sex? CODE '00' IF NONE.	REFUSED = -9	
1206	How old were you the first time someone physically forced you to have sex?	AGE IN YEARS _____ DON'T KNOW = -8 REFUSED = -9	
1207	The first time someone physically forced you to have sex, was the person male or female? If it was more than one person, what was the sex of the person you knew the best?	MALE = 1 FEMALE = 2 DON'T KNOW = 8 REFUSED = 9	
1208	What was this person's relationship to you? If it was more than one person, what was the relationship with the person you knew the best?	BOYFRIEND/GIRLFRIEND/LIVE-IN PARTNER/SPOUSE = 1 EX-BOYFRIEND/GIRLFRIEND/PARTNER/SPOUSE = 2 RELATIVE/FAMILY MEMBER = 3 CLASSMATE/SCHOOLMATE = 4 TEACHER = 5 POLICE/SECURITY OFFICER/MILITARY= 6 EMPLOYER = 7 NEIGHBOR = 8 COMMUNITY/ RELIGIOUS LEADER = 9 FRIEND = 10 STRANGER = 11 OTHER = 96 DON'T KNOW = -8 REFUSED = -9	
1209	In the last 12 months, did someone physically force you to have sex?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED →1213
1210	In the last 12 months, did a partner physically force you to have sex? By partner, I mean a live-in partner whether or not you were married at	YES =1 NO, DID NOT FORCE = 2 NO, DID NOT HAVE A LIVE-IN PARTNER IN THE LAST 12 MONTHS= 3	

	the time. .	DON'T KNOW = 8 REFUSED = 9	
1211	The last time someone physically forced you to have sex, was the person male or female? If it was more than one person, what was the sex of the person you knew the best?	MALE = 1 FEMALE = 2 DON'T KNOW = 8 REFUSED = 9	SKIP IF ONLY HAPPENED ONCE.
1212	What was this person's relationship to you? If it was more than one person, what was the relationship with the person you knew the best?	BOYFRIEND/GIRLFRIEND/LIVE-IN PARTNER/SPOUSE = 1 EX-BOYFRIEND/GIRLFRIEND/PARTNER/SPOUSE = 2 RELATIVE/FAMILY MEMBER = 3 CLASSMATE/SCHOOLMATE = 4 TEACHER = 5 POLICE/SECURITY OFFICER/MILITARY= 6 EMPLOYER = 7 NEIGHBOR = 8 COMMUNITY/ RELIGIOUS LEADER = 9 FRIEND = 10 STRANGER = 11 OTHER = 96 DON'T KNOW = -8 REFUSED = -9	SKIP IF ONLY HAPPENED ONCE.
1213	How many times in your life has someone <u>pressured</u> you to have sex through harassment, threats and tricks and did succeed? CODE '00' IF NONE. Being pressured can include being worn down by someone who repeatedly asks for sex, feeling pressured by being lied to, being told promises that were untrue, having someone threaten to end a relationship or spread rumors or sexual pressure due to someone using their influence or authority.	NUMBER OF TIMES____ DON'T KNOW = -8 REFUSED = -9	NONE, D, REFUSED→1221

1214	How old were you the <u>first time</u> someone pressured you to have sex and did succeed?	AGE IN YEARS ____ DON'T KNOW = -8 REFUSED = -9	
1215	The first time someone pressured you to have sex and did succeed, was the person male or female? If it was more than one person, what was the sex of the person you knew the best?	MALE = 1 FEMALE = 2 DON'T KNOW = 8 REFUSED = 9	
1216	What was this person's relationship to you? If it was more than one person, what was your relationship with the person you knew the best?	BOYFRIEND/GIRLFRIEND/LIVE -IN PARTNER/SPOUSE = 1 EX-BOYFRIEND/GIRLFRIEND/PARTNER/SPOUSE = 2 RELATIVE/FAMILY MEMBER = 3 CLASSMATE/SCHOOLMATE = 4 TEACHER = 5 POLICE/SECURITY OFFICER/MILITARY= 6 EMPLOYER = 7 NEIGHBOR = 8 COMMUNITY/ RELIGIOUS LEADER = 9 FRIEND = 10 STRANGER = 11 OTHER = 96 DON'T KNOW = -8 REFUSED = -9	
1217	In the last 12 months, did someone pressure you to have sex and did succeed?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED → 1221
1218	In the last 12 months, did a partner pressure you to have sex and did succeed? By partner, I mean a live-in partner whether or not you were married at the time. .	YES =1 NO, DID NOT PRESSURE ANDUCCEED = 2 NO, DID NOT HAVE A LIVE-IN PARTNER IN THE LAST 12 MONTHS = 3 DON'T KNOW = 8	

		REFUSED = 9	
1219	The last time someone pressured you to have sex and did succeed, was the person male or female? If it was more than one person, what was the sex of the person you knew the best?	MALE = 1 FEMALE = 2 DON'T KNOW = 8 REFUSED = 9	SKIP IF ONLY HAPPENED ONCE.
1220	What was this person's relationship to you? If it was more than one person, what was your relationship with the person you knew the best?	BOYFRIEND/GIRLFRIEND/LIVE-IN PARTNER/SPOUSE = 1 EX-BOYFRIEND/GIRLFRIEND/PARTNER/SPOUSE = 2 RELATIVE/FAMILY MEMBER = 3 CLASSMATE/SCHOOLMATE = 4 TEACHER = 5 POLICE/SECURITY OFFICER/MILITARY= 6 EMPLOYER = 7 NEIGHBOR = 8 COMMUNITY/ RELIGIOUS LEADER = 9 FRIEND = 10 STRANGER = 11 OTHER = 96 DON'T KNOW = -8 REFUSED = -9	SKIP IF ONLY HAPPENED ONCE.
1221	After any of these unwanted sexual experiences, did you try to seek professional help or services from any of the following? SELECT ALL THAT APPLY.	I DID NOT TRY TO SEEK HELP = A HEALTHCARE PROFESSIONAL = B POLICE OR OTHER SECURITY PERSONNEL = C SOCIAL WORKER, COUNSELOR OR NON-GOVERNMENTAL ORGANIZATION = D RELIGIOUS LEADER = E OTHER = X DON'T KNOW = Y REFUSED = Z	DID NOT TRY TO SEEK HELP →1222 ELSE→1223 SKIP IF NEVER EXPERIENCED.
1222	What was the main reason that you did not try to seek professional help	DID NOT KNOW SERVICES WERE AVAILABLE = 1	SKIP IF NEVER EXPERIENCED.

	or services?	SERVICES NOT AVAILABLE = 2 AFRAID OF GETTING IN TROUBLE = 3 ASHAMED FOR SELF/FAMILY = 4 COULD NOT AFFORD SERVICES = 5 DID NOT THINK IT WAS A PROBLEM = 6 FELT IT WAS MY FAULT = 7 AFRAID OF BEING ABANDONED = 8 DID NOT NEED/WANT SERVICES = 9 AFRAID OF MAKING SITUATION WORSE = 10 OTHER = 96 DON'T KNOW = -8 REFUSED = -9	
1223	Has anyone ever done any of these things to you: - Punched, kicked, whipped, or beat you with an object - Slapped you, threw something at you that could hurt you, pushed you or shoved you - Choked smothered, tried to drown you, or burned you intentionally - Used or or threatened you with a knife, gun or other weapon?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED →END OF MODULE
1224	How old were you the first time one of these things happened to you?	AGE IN YEARS _____ DON'T KNOW = -8 REFUSED = -9	
1225	In the last 12 months, how many times did someone: - Punched, kicked, whipped, or beat you with an object - Slapped you, threw	NOT IN LAST 12 MONTHS = 1 ONCE = 2 FEW = 3 MANY = 4 DON'T KNOW = 8 REFUSED = 9	NO, DK, REFUSED →END OF MODULE

	something at you that could hurt you, pushed you or shoved you - Choked smothered, tried to drown you, or burned you intentionally - Used or or threatened you with a knife, gun or other weapon?		
1226	In the last 12 months, did a partner do any of these things to you? By partner, I mean a live-in partner whether or not you were married at the time.	YES =1 NO, PARTNER DID = 2 NO, DID NOT HAVE A LIVE-IN PARTNER IN THE LAST 12 MONTHS PARTNER = 3 DON'T KNOW = 8 REFUSED = 9	
1227	The last time any of these things happened, was the person male or female? If it was more than one person, what was the sex of the person you knew the best?	MALE = 1 FEMALE = 2 DON'T KNOW = -8 REFUSED = 9	
1228	The last time any of these things happened, what was this person's relationship to you? If it was more than one person, what was your relationship with the person you knew the best?	BOYFRIEND/GIRLFRIEND/LIVE-IN PARTNER/SPOUSE = 1 EX-BOYFRIEND/GIRLFRIEND/PARTNER/SPOUSE = 2 RELATIVE/FAMILY MEMBER = 3 CLASSMATE/SCHOOLMATE = 4 TEACHER = 5 POLICE/SECURITY OFFICER/MILITARY= 6 EMPLOYER = 7 NEIGHBOR = 8 COMMUNITY/ RELIGIOUS LEADER = 9 FRIEND = 10 STRANGER = 11 OTHER = 96 DON'T KNOW = -8 REFUSED = -9	
1229	For any of the times in the last 12 months that one of these things happened to you, did you receive	YES = 1 NO = 2 DON'T KNOW = 8	NO, DK, REFUSED →1231

	any injuries?	REFUSED = 9	
1230	Did you experience any of the following? READ EACH RESPONSE. SELECT ALL THAT APPLY	CUTS, SCRATCHES, BRUISES, ACHES, REDNESS OR SWELLING OR OTHER MINOR MARK = A SPRAINS, DISLOCATIONS, OR BLISTERING = B DEEP WOUNDS, BROKEN BONES, BROKEN TEETH, OR BLACKENED OR CHARRED SKIN =C PERMANENT INJURY OR DISFIGUREMENT =D DON'T KNOW = Y REFUSED = Z	
1231	Thinking about all these experiences that we just discussed, whether someone has done the following: - Punched, kicked whipped or beat you with an object - Choked, smothered, tried to drown you or burned you intentionally - Used or threatened you with a knife, gun or other weapon Did you try to seek professional help or services for any of these incidents from any of the following? SELECT ALL THAT APPLY.	I DID NOT TRY TO SEEK HELP = A HEALTHCARE PROFESSIONAL = B POLICE OR OTHER SECURITY PERSONNEL = C SOCIAL WORKER, COUNSELOR OR NON-GOVERNMENTAL ORGANIZATION = D RELIGIOUS LEADER = E OTHER = X DON'T KNOW = Y REFUSED = Z	DID NOT TRY TO SEEK HELP →1232 ELSE→END OF MODULE SKIP IF NEVER EXPERIENCED
1232	What was the main reason that you did not try to seek professional help or services?	DID NOT KNOW SERVICES WERE AVAILABLE = 1 SERVICES NOT AVAILABLE = 2 AFRAID OF GETTING IN TROUBLE = 3 ASHAMED FOR SELF/FAMILY = 4 COULD NOT AFFORD SERVICES = 5 DID NOT THINK IT WAS A PROBLEM = 6 FELT IT WAS MY FAULT = 7 AFRAID OF BEING ABANDONED = 8	

		DID NOT NEED/WANT SERVICES = 9 AFRAID OF MAKING SITUATION WORSE = 10 OTHER = 96 DON'T KNOW = -8 REFUSED = -9	
1233	Thank you for sharing your personal experiences with me. I know it may have been difficult for you to talk about your experiences with me. If you would like to talk further about these experiences, I can refer you to a place that can provide you with help. PROVIDE PARTICIPANT WITH LIST OF ORGANIZATIONS.		SKIP IF NEVER EXPERIENCED.
	You mentioned earlier that you have sold sex for money. Thank you for sharing your personal experiences with me. If you want to talk further about these experiences, I can refer you to a place that can provide you with help. FILL OUT REFERRAL FORM FOR CHILDREN IDENTIFIED AS TRAFFICKED MINORS. FILL OUT SUMMARY OF REFERRED TRAFFICKED MINORS. PROVIDE PARTICIPANT WITH LIST OF ORGANIZATIONS, IF NOT ALREADY GIVEN.		SKIP IF >18 YEARS OLD SKIP IF NEVER SOLD SEX

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

Interviewer reads:

What language do you prefer for our discussion today?

____English

____Chichewa

____Tumbuka

Hello. My name is_____. I would like to invite you to take part in this research study/survey about HIV in Malawi. The Ministry of Health is leading this survey and is conducting it with the United States Centers for Disease Control and Prevention and ICAP at Columbia University and the Centre for Social Research (CSR).

Title of Survey: Malawi Population-Based HIV Impact Assessment

Purpose of survey
This survey will help us know how many people in Malawi have HIV and need health services. It will also tell us about people's risk for HIV. About 15,000 households will join this survey. We would like your household to join the survey too. What you tell us will help the Ministry of Health make HIV services better in the country.

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

Survey Procedures
There are two parts to this survey– a household interview and individual interviews. In the household interview, we would like to ask you some questions about the people living in your household. We will ask how many people live here, their relationship to you, their gender, and age. We will also ask you about some of the things you have in your household. The household interview will take up to 30 minutes.

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

Right to refuse or withdraw
Your participation in this household interview is entirely voluntary. If you choose to take part in the interview, you may change your mind at any time and stop participating. If you decide not to take part, it will not affect your healthcare in any way.

Risks
The risks to participating in the household interview are small. We will do everything we can to keep your information private. However, we cannot promise complete confidentiality. You may feel uncomfortable about some of the questions we will ask. You can refuse to answer any question.

Benefits
There may be no direct benefit to you but the information you provide to us will be used to improve the health of Malawians. Your responses will help the Ministry of Health to develop more effective programs to fight HIV.

Alternatives to participation
You do not have to participate in this survey.

Confidentiality and Access to Your Health Information
We will do everything we can to keep your answers private. What we talk about will be kept private. Your name and signed informed consent form will be kept separate from your answers to the questions. Your answers to the questions will be identified only by a number. Your name will not appear when we share survey results. Only people working on the survey will have access to the information we collect during the survey.

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

- Staff members from the Institutional Review Boards or Ethics Committees overseeing the conduct of this survey to ensure that we are protecting your rights as a participant. These include the National Health Sciences Research Committee in Malawi (NHSRC) and the Institutional Review Boards at the Centers for Disease Control and Prevention (CDC; Atlanta, USA), Columbia University Medical Center and Westat (a statistical survey research organization)
- The U.S. 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 participant in this survey
- Study staff and study monitors

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

Address: Ministry of Health, PO Box 30377, Lilongwe, Malawi Phone:
+265888892212
Email: gafbello@yahoo.co.uk

If you decide to leave the study, no more information will be collected from you. However, we will not be able to take back the information that has already been collected and shared.

Costs for being in the survey

There is no cost to you for being in the household interview. You should also know that you would not be paid to be in the interview. This survey has received approval from the National Health Sciences Research Committee in Malawi and the Institutional Review Boards at the Centers for Disease Control and Prevention, Columbia University Medical Center and Westat.

If you have any questions about your rights as a participant in this survey, you can contact: Dr. Damson Katyola
Address: Ministry of Health, National Science Research Council, P.O Box 30337, Lilongwe, Malawi
Phone: +2651726422/418
Email: dkathyola@gmail.com

Do you want to ask me anything about the survey?

Consent Statement
I have read this form and/or someone has read it to me. I was encouraged to ask questions and given time to ask questions. Any questions that I had have been answered satisfactorily. I agree to participate in the household interview. I know that after choosing to be in the interview, I may withdraw at any time. My participation is voluntary. I have been offered a copy of this consent form.
Do you agree to do the household interview? 'YES' means that you agree to do the interview. 'NO' means that you will NOT do the interview.

_____Yes _____No

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

Printed name of head of household_____

Household ID number _____

[For illiterate participants]

Signature of witness_____ Date:___/___/___

Printed name of witness_____

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

Printed name of person obtaining consent_____

Survey staff ID number _____

Consent for Interview: Adults ages 18-64 years

Interviewer reads:

What language do you prefer for our discussion today?

____English

____Chichewa

____Tumbuka

Hello. My name is_____. We are doing a research study/survey throughout Malawi to learn more about HIV in the country. The Ministry of Health is leading this survey and is conducting it with the United States Centers for Disease Control and Prevention and ICAP at Columbia University and the Centre for Social Research (CSR).

Title of Survey: Malawi Population-Based HIV Impact Assessment

Purpose of the survey

This survey will help us know how many people in Malawi have HIV and need health services. It will also tell us about people's risk for getting HIV. We expect about 30,000 men, women, and children from 15,000 households throughout Malawi to take part in this survey. We would like to invite you to join the survey too. Your participation will help the Ministry of Health make HIV services better. The United States Government is the sponsor of the survey.

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

Survey Procedures
If you join this survey, we will ask you questions about your age, what kind of work you do, whether you have had any experience with HIV services, and your sexual behaviors. The interview will take about 40 minutes.

After the interview, we will offer you an HIV test. We will ask you for consent for the HIV test and blood draw and storage for future testing after the interview. The testing and counseling session will take about 40 minutes.

Right to refuse or withdraw
You do not have to be in the survey, and if you choose to join the survey, you may change your mind at any time and stop participating. If you decide not to take part, it will not affect your healthcare in any way.

Risks and benefits
The risks in being in the survey are small. We will do everything we can to keep your information private. However, we cannot promise complete confidentiality. You may feel uncomfortable about some of the questions we will ask. You can refuse to answer any question. There may be no direct benefit to you but your taking part in this research could help us learn more about HIV in Malawi. It can also help us learn about how HIV prevention and treatment programs are working. Your participation is important.

Confidentiality and Access to Your Health Information
We will do everything we can to keep your participation in the survey and your answers private. Your name and

signed informed consent forms will be kept separate from your answers to the questions. Your answers to the questions will be identified only by a number. Your name will not appear when we share survey results. Only people working on the survey will have access to the data during the survey.

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

- Staff members from the Institutional Review Boards or Ethics Committees overseeing the conduct of this survey to ensure that we are protecting your rights as a participant. These include the National Health Sciences Research Committee in Malawi (NHSRC) and the Institutional Review Boards at the Centers for Disease Control and Prevention (CDC; Atlanta, USA), Columbia University Medical Center and Westat (a statistical survey research organization)
- The U.S. 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 participant in this survey
- Study staff and study monitors

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

Address: Ministry of Health, PO Box 30377, Lilongwe, Malawi Phone:
+265888892212
Email: gafbello@yahoo.co.uk

If you decide to leave the study, no more information will be collected from you. However, we will not be able to take back the information that has already been collected and shared.

Costs for being in the survey
There is no cost to you for being in the survey. You should also know that you would not be paid to be in the survey.

If you have any questions about your rights as a participant in this survey, you can contact:

Dr. Damson Katyola
Address: Ministry of Health, National Science Research Council, P.O Box 30337, Lilongwe, Malawi
Phone: +2651726422/418
Email: dkathyola@gmail.com

Do you want to ask me anything about the survey?

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

1. Do you agree to do the interview? 'YES' means that you agree to do the interview. 'NO' means that you will NOT do the interview.
   _____Yes _____No

2. **FUTURE RESEARCH:** It is possible that you may be eligible to participate in future studies related to health in Malawi. We are asking for your permission to contact you in the next two years if such an opportunity occurs. If we contact you, we will give you details about the new study and ask you to sign a separate consent form at that time. You may decide at that time that you do not want to take part in that study. If you do not wish to be contacted about future studies, it does not affect your involvement in this study. Do you agree to be contacted in the future? 'YES' means that you agree to be contacted in the future if a study opportunity arises. 'NO' means that you will NOT be contacted about future studies.

   _____YES _____NO

Participant signature or mark_____ Date:___/___/___

Printed name of participant_____

Participant ID number _____

[For illiterate participants]

Signature of witness_____ Date:___/___/___

Printed name of witness_____

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

Printed name of person obtaining consent_____

Survey staff ID number _____

Consent from Parent/Guardian for Blood Draw for Children, ages 0-5 years

Interviewer reads:

What language do you prefer for our discussion today?

____English

____Chichewa

____Tumbuka

Now I would like to ask you to let your son/daughter take part in the survey.

Title of Survey: Malawi Population-Based HIV Impact Assessment

Purpose of the survey
This research study/survey will help us learn more about the health of children in Malawi. We plan to ask thousands of children like yours to join this survey. We would like to invite your child to join the survey too. Your child's participation will help the Ministry of Health make HIV services better.

Survey Procedures
If you agree to allow your child ages 2-5 to take part in the survey, a trained nurse will take a small amount or about 5 mL of blood from your child's arm to perform an HIV test here in your home. If it is not possible to take blood from your child's arm, then we will try to take a few drops of blood from your child's finger and then perform the HIV test here in your home. If your child is less than 2 years, we will take a few drops (about 1 mL) from your child's finger or heel for the HIV test. We will give you the results today. We will provide counseling about the results and discuss with you how to share the results with your child if you decide to share them with him/her. If you would like, we can discuss the test results together with your child. The entire testing and counseling session will take about 40 minutes.

If your child tests positive for HIV, we will also test the amount of CD4 cells in his/her blood and give you the result today. CD4 cells are the part of your immune system that fights HIV infection and other diseases. We will give you a referral form and information so that you and your child can consult with a doctor or nurse to learn more about his/her HIV test, CD4 count and health. We will also test the CD4 level of some people without HIV.

If your child tests positive for HIV, we will also send his/her blood to a laboratory to measure his/her viral load. Viral load is the amount of HIV in the blood. If you provide us with the name of a health facility, we can send your child's viral load results there about six to eight weeks from now. You will be able to talk to a doctor or nurse at the facility about the test result.

We will also do other additional tests related to HIV. If we have test results that might guide your child's care or treatment, we will contact you to tell you how you and your child's doctor or nurse may get these results.

We would like to ask your permission to store your child's leftover blood for future research tests. These tests may be about HIV or other health issues important for the health of Malawians, such as nutrition or immunization. This sample will be stored for an indefinite amount of time but your child's 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 for your child's health. Your child's leftover blood will not be sold or used for commercial

reasons. If you do not agree to long-term storage of your child's blood samples, we will destroy your child's blood samples after survey-related testing has been completed.

[For children ages 0-<18 months only]
The body makes antibodies to fight HIV. Antibodies from a mother with HIV can enter the baby's blood during pregnancy. The test we perform on your child today will let us know if your child is exposed to HIV. If it is positive, it does not mean your child has the virus in his/her blood. It just confirms that he/she has been exposed to HIV. We will need to send your child's blood to a lab for a special test to confirm if he/she has the HIV infection. If you provide us with the name of a health facility, we can send the result there in about six weeks from now. We will also contact you to inform you that the results have been sent to the facility, if you provide us with your contact information. You will be able to talk to a doctor or nurse at the facility about the test result.

[**For children 0-5 years**]
If your child tests positive for HIV, we will also measure your child's weight and height to track your child's growth and monitor their health. We will also measure weight and height for some children without HIV. The results will be returned to you and you will be able to talk to a doctor or nurse at the facility about the result.

Right to refuse or withdraw
It is your decision about whether you will allow your child to join the survey. Your child does not have to be in the survey. Your child may stop participation at any time. If your child does not take part, it will not affect your child's healthcare in any way.

Risks
The risks to being in the survey and drawing blood are small. They include brief pain from the needle stick, bruising, lightheadedness, bleeding, and rarely, infection where the needle enters the skin. We will do everything we can to keep your child's information private. However, we cannot promise complete confidentiality.

You may learn that your child is infected with HIV. If you find out that your child is HIV-positive, we will tell you where he/she may go for care and treatment. Care and treatment provided by the Ministry of Health is free. However, learning that your child has HIV may cause some emotional discomfort. You will decide when yourchild should be told of the test result. We will support whatever decision you make and will provide counseling on how to cope with learning that your child has HIV.

Benefits
The main benefit for your child to be in the survey is the chance to learn more about his/her health today. Some children who participate will test HIV-positive. If this happens to your child, the benefit is that you will learn his/her HIV status and will learn where to take your child for life-saving treatment. If you already know that your child is HIV-positive and he/she is on treatment, the CD4 and viral load tests can help your child's doctor or nurse judge how well the treatment is working. Your child's taking part in this research could help us learn more about children and HIV in Malawi. It can also help us learn about how HIV prevention and treatment programs are working.

Confidentiality and Access to Your Health Information
We will do everything we can to keep your child's participation in the survey confidential. Your child's name and the consent forms will be kept separate from his/her health information. The information we collect from your child will be identified by a number and not by your name or your child's name. Your name and your child's name will not appear when we share survey results. Only people working on the survey will have access to the

data during the survey.

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

- Staff members from the Institutional Review Boards or Ethics Committees overseeing the conduct of this survey to ensure that we are protecting your child's rights as a participant. These include the National Health Sciences Research Committee in Malawi (NHSRC) and the Institutional Review Boards at the Centers for Disease Control and Prevention (CDC; Atlanta, USA), Columbia University Medical Center and Westat (a statistical survey research organization)
- The U.S. Office of Human Research Protections and other government agencies that oversee the safety of human subjects to ensure we are protecting your child's rights as a participant in this survey
- Study staff and study monitors

The information we collect from your child will not be released outside of the survey groups listed above unless there is an issue of safety. Your permission to allow us to use and share your child's name and contact information with the groups above will expire three years after the end of the survey. Your child can leave the study at any time for any reason. If you want your child to leave the study, have any questions about the survey, or feel that your child has been harmed by taking part, you should contact the Principal Investigator Dr. George Bello who can be reached at

Address: Ministry of Health, PO Box 30377, Lilongwe, Malawi Phone:
+265888892212
Email: gafbello@yahoo.co.uk

If you or your child decides that he/she should leave the survey, no more information will be collected from him/her. However, we will not be able to take back the information that has already been collected and shared.

Costs for being in the survey
There is no cost to you for your child being in the survey. You should also know that you and your child would not be paid for your child to be in the survey.

If you have any questions about your child's rights as a participant in this survey, you can contact:
Dr. Damson Katyola
Address: Ministry of Health, National Science Research Council, P.O Box 30337, Lilongwe, Malawi
Phone: +2651726422/418
Email: dkathyola@gmail.com

Do you want to ask me anything about your child's participation in the survey?

Consent Statement

I have read this form, and/or someone has read it to me. I was encouraged to ask questions and given time to ask questions. Any questions I had have been answered satisfactorily. I agree for my child to take part in this survey. I know that after allowing my child to participate, I may change my mind and withdraw him/her from taking part in this survey at any time. I have been offered a copy of this consent form.

1. Do you agree that your child give blood for HIV testing and related testing? 'YES' means that you give your permission to have the nurse collect a sample of your child's blood for HIV testing and

related testing. 'NO' means that your child will NOT give blood for HIV testing and related testing.
_____Yes _____No
(if "Yes" proceed to the next question)

2. Do you agree to have your child's leftover blood stored for future research? 'YES' means that you give permission for your child's blood samples to be stored for future research. 'NO' means that your child's blood samples will NOT be stored for future research.
_____Yes _____No

Parent/guardian signature or mark_____ Date:___/___/___

Printed name of parent/guardian_____

Parent/guardian ID number_____

[For illiterate participants]

Signature of witness_____ Date:___/___/___

Printed name of witness_____

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

Printed name of person obtaining consent_____

Survey staff ID number _____

Child's name (print) _____

Child's participant ID number _____

Consent from Parent/Guardian for Blood Draw for Children, ages 6-9 years

Interviewer reads:

What language do you prefer for our discussion today?

____English

____Chichewa

____Tumbuka

Now I would like to ask you to let your son/daughter take part in the survey.

Title of Survey: Malawi Population-Based HIV Impact Assessment

Purpose of the survey
This research study/survey will help us learn more about the health of children in Malawi. We plan to ask thousands of children like yours to join this survey. We would like to invite your child to join the survey too. Your child's participation will help the Ministry of Health make HIV services better.

Survey Procedures
If you agree to allow your child to take part in the survey, a trained nurse will take a small amount or about 5 mL of blood from your child's arm to perform an HIV test here in your home. If it is not possible to take blood from your child's arm, then we will try to take a few drops of blood from your child's finger and then perform the HIV test here in your home. We will give you the results today. We will provide counseling about the results and discuss with you how to share the results with your child if you decide to share them with him/her. If you would like, we can discuss the test results together with your child. The entire testing and counseling session will take about 40 minutes.

If your child tests positive for HIV, we will also test the amount of CD4 cells in his/her blood and give you the result today. CD4 cells are the part of your immune system that fights HIV infection and other diseases. We will give you a referral form and information so that you and your child can consult with a doctor or nurse to learn more about his/her HIV test, CD4 count and health. We will also test the CD4 level of some people without HIV.

If your child tests positive for HIV, we will also send his/her blood to a laboratory to measure his/her viral load. Viral load is the amount of HIV in the blood. If you provide us with the name of a health facility, we can send your child's viral load results there about six to eight weeks from now. You will be able to talk to a doctor or nurse at the facility about the test result.

We will also do other additional tests related to HIV. If we have test results that might guide your child's care or treatment, we will contact you to tell you how you and your child's doctor or nurse may get these results.

We would like to ask your permission to store your child's leftover blood for future research tests. These tests may be about HIV or other health issues important for the health of Malawians, such as nutrition or immunization. This sample will be stored for an indefinite amount of time but your child's 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 for your child's health. Your child's leftover blood will not be sold or used for commercial reasons. If you do not agree to long-term storage of your child's blood samples, we will destroy your child's

blood samples after survey-related testing has been completed.

Right to refuse or withdraw
It is your decision about whether you will allow your child to join the survey. Your child does not have to be in the survey. Your child may stop participation at any time. If your child does not take part, it will not affect your child's healthcare in any way.

Risks
The risks to being in the survey and drawing blood are small. They include brief pain from the needle stick, bruising, lightheadedness, bleeding, and rarely, infection where the needle enters the skin. We will do everything we can to keep your child's information private. However, we cannot promise complete confidentiality.

You may learn that your child is infected with HIV. If you find out that your child is HIV-positive, we will tell you where he/she may go for care and treatment. Care and treatment provided by the Ministry of Health is free. However, learning that your child has HIV may cause some emotional discomfort. You will decide when your child should be told of the test result. We will support whatever decision you make and will provide counseling on how to cope with learning that your child has HIV.

Benefits
The main benefit for your child to be in the survey is the chance to learn more about his/her health today. Some children who participate will test HIV-positive. If this happens to your child, the benefit is that you will learn his/her HIV status and will learn where to take your child for life-saving treatment. If you already know that your child is HIV-positive and he/she is on treatment, the CD4 and viral load tests can help your child's doctor or nurse judge how well the treatment is working. Your child's taking part in this research could help us learn more about children and HIV in Malawi. It can also help us learn about how HIV prevention and treatment programs are working.

Confidentiality and Access to Your Health Information
We will do everything we can to keep your child's participation in the survey confidential. Your child's name and the consent forms will be kept separate from his/her health information. The information we collect from your child will be identified by a number and not by your name or your child's name. Your name and your child's name will not appear when we share survey results. Only people working on the survey will have access to the data during the survey.

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

- Staff members from the Institutional Review Boards or Ethics Committees overseeing the conduct of this survey to ensure that we are protecting your child's rights as a participant. These include the National Health Sciences Research Committee in Malawi (NHSRC) and the Institutional Review Boards at the Centers for Disease Control and Prevention (CDC; Atlanta, USA), Columbia University Medical Center and Westat (a statistical survey research organization)
- The U.S. Office of Human Research Protections and other government agencies that oversee the safety of human subjects to ensure we are protecting your child's rights as a participant in this survey
- Study staff and study monitors

The information we collect from your child will not be released outside of the survey groups listed above unless

there is an issue of safety. Your permission to allow us to use and share your child's name and contact information with the groups above will expire three years after the end of the survey. Your child can leave the study at any time for any reason. If you want your child to leave the study, have any questions about the survey, or feel that your child has been harmed by taking part, you should contact the Principal Investigator Dr. George Bello who can be reached at

Address: Ministry of Health, PO Box 30377, Lilongwe, Malawi Phone:
+265888892212
Email: gafbello@yahoo.co.uk

If you or your child decides that he/she should leave the survey, no more information will be collected from him/her. However, we will not be able to take back the information that has already been collected and shared.

Costs for being in the survey
There is no cost to you for your child being in the survey. You should also know that you and your child would not be paid for your child to be in the survey.

If you have any questions about your child's rights as a participant in this survey, you can contact:
Dr. Damson Katyola
Address: Ministry of Health, National Science Research Council, P.O Box 30337, Lilongwe, Malawi
Phone: +2651726422/418
Email: dkathyola@gmail.com

Do you want to ask me anything about your child's participation in the survey?
Consent Statement

I have read this form, and/or someone has read it to me. I was encouraged to ask questions and given time to ask questions. Any questions I had have been answered satisfactorily. I agree for my child to take part in this survey. I know that after allowing my child to participate, I may change my mind and withdraw him/her from taking part in this survey at any time. I have been offered a copy of this consent form.

1. Do you agree that your child give blood for HIV testing and related testing? 'YES' means that you give your permission to have the nurse collect a sample of your child's blood for HIV testing and related testing. 'NO' means that your child will NOT give blood for HIV testing and related testing.
   _____Yes _____No

(if "Yes" proceed to the next question)

2. Do you agree to have your child's leftover blood stored for future research? 'YES' means that you give permission for your child's blood samples to be stored for future research. 'NO' means that your child's blood samples will NOT be stored for future research.
   _____Yes _____No

Parent/guardian signature or mark_____ Date:___/___/___

Printed name of parent/guardian_____

Parent/guardian ID number_____

[For illiterate participants]

Signature of witness_____ Date:___/___/___

Printed name of witness_____

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

Printed name of person obtaining consent_____

Survey staff ID number _____

Child's name (print) _____

Child's participant ID number _____

Permission from Parent/Guardian for Blood Draw for Children, ages 10-14 years

Interviewer reads:

What language do you prefer for our discussion today?

____English

____Chichewa

____Tumbuka

Now I would like to ask you to give us permission to invite your son/daughter to take part in the survey.

Title of Survey: Malawi Population-Based HIV Impact Assessment

Purpose of the survey
This research study/survey will help us learn more about the health of children in Malawi. We plan to ask thousands of children like yours to join this survey. We would like to invite your child to join the survey too. Your child's participation will help the Ministry of Health make HIV services better.

Survey Procedures
If you agree to allow us to invite your child to take part in the survey, we will invite him/her to participate and a trained nurse will take a small amount or about 5 mL of blood from your child's arm to perform an HIV test here in your home. If it is not possible to take blood from your child's arm, then we will try to take a few drops of blood from your child's finger and then perform the HIV test here in your home. We will give you the results today. We will provide counseling about the results and discuss with you how to share the results with your child if you decide to share them with him/her. If you would like, we can discuss the test results together with your child. The entire testing and counseling session will take about 40 minutes.

If your child tests positive for HIV, we will also test the amount of CD4 cells in his/her blood and give you the result today. CD4 cells are the part of your immune system that fights HIV infection and other diseases. We will give you a referral form and information so that you and your child can consult with a doctor or nurse to learn more about his/her HIV test, CD4 count and health. We will also test the CD4 level of some people without HIV.

If your child tests positive for HIV, we will also send his/her blood to a laboratory to measure his/her viral load. Viral load is the amount of HIV in the blood. If you provide us with the name of a health facility, we can send your child's viral load results there about six to eight weeks from now. You will be able to talk to a doctor or nurse at the facility about the test result.

We will also do other additional tests related to HIV. If we have test results that might guide your child's care or treatment, we will contact you to tell you how you and your child's doctor or nurse may get these results.

We would like to ask your permission to store your child's leftover blood for future research tests. These tests may be about HIV or other health issues important for the health of Malawians, such as nutrition or immunization. This sample will be stored for an indefinite amount of time but your child's 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 for your child's health. Your child's leftover blood will not be sold or used for commercial reasons. If you do not agree to long-term storage of your child's blood samples, we will destroy your child's

blood samples after survey-related testing has been completed.

If you agree to allow us to invite your child to participate, we would inform him/her about the survey and ask his/her assent to participate in the survey. We would tell you the results of the tests we conduct here today. You will decide when your child should be told of the test results. If you would like, we can discuss the test results together with your child.

Right to refuse or withdraw
It is your decision about whether you will allow us to invite your child to join the survey. Your child does not have to be in the survey. Your child may stop participation at any time. If your child does not take part, it will not affect your child's healthcare in any way. If you agree to allow us to invite your child to participate, you will have the option for your child to test for HIV and CD4 counts and the option to have his/her blood stored for future research.

Risks
The risks to being in the survey and drawing blood are small. They include brief pain from the needle stick, bruising, lightheadedness, bleeding, and rarely, infection where the needle enters the skin. We will do everything we can to keep your child's information private. However, we cannot promise complete confidentiality.

You may learn that your child is infected with HIV. If you find out that your child is HIV-positive, we will tell you where he/she may go for care and treatment. Care and treatment provided by the Ministry of Health is free. However, learning that your child has HIV may cause some emotional discomfort. You will decide when your child should be told of the test result. We will support whatever decision you make and will provide counseling on how to cope with learning that your child has HIV.

Benefits
The main benefit for your child to be in the survey is the chance to learn more about his/her health today. Some children who participate will test HIV-positive. If this happens to your child, the benefit is that you will learn his/her HIV status and will learn where to take your child for life-saving treatment. If you already know that your child is HIV-positive and he/she is on treatment, the CD4 and viral load tests can help your child's doctor or nurse judge how well the treatment is working. Your child's taking part in this research could help us learn more about children and HIV in Malawi. It can also help us learn about how HIV prevention and treatment programs are working.

Confidentiality and Access to Your Health Information
We will do everything we can to keep your child's participation in the survey confidential. Your child's name and the permission and assent forms will be kept separate from his/her health information. The information we collect from your child will be identified by a number and not by your name or your child's name. Your name and your child's name will not appear when we share survey results. Only people working on the survey will have access to the data during the survey.

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

- Staff members from the Institutional Review Boards or Ethics Committees overseeing the conduct of this survey to ensure that we are protecting your child's rights as a participant. These include the National Health Sciences Research Committee in Malawi (NHSRC) and the Institutional Review Boards at the Centers for Disease Control and Prevention (CDC; Atlanta, USA), Columbia University Medical Center and Westat (a statistical survey research organization)

- The U.S. Office of Human Research Protections and other government agencies that oversee the safety of human subjects to ensure we are protecting your child's rights as a participant in this survey
- Study staff and study monitors

The information we collect from your child will not be released outside of the study partners listed above unless there is an issue of safety. Your permission to allow us to use and share your child's name and contact information with the groups above will expire three years after the end of the survey. Your child can leave the study at any time for any reason. If you want your child to leave the study, have any questions about the survey, or feel that your child has been harmed by taking part, you should contact the Principal Investigator Dr. George Bello who can be reached at

Address: Ministry of Health, PO Box 30377, Lilongwe, Malawi Phone:
+265888892212
Email: gafbello@yahoo.co.uk

If you or your child decides that he/she should leave the survey, no more information will be collected from him/her. However, we will not be able to take back the information that has already been collected and shared.

Costs for being in the survey
There is no cost to you for your child being in the survey. You should also know that you and your child would not be paid for your child to be in the survey.
If you have any questions about your child's rights as a participant in this survey, you can contact:
Dr. Damson Katyola
Address: Ministry of Health, National Science Research Council, P.O Box 30337, Lilongwe, Malawi
Phone: +2651726422/418
Email: dkathyola@gmail.com

Do you want to ask me anything about your child's participation in the survey?

Permission Statement

I have read this form, and/or someone has read it to me. I was encouraged to ask questions and given time to ask questions. Any questions I had have been answered satisfactorily. I agree for my child to take part in this survey. I know that after allowing my child to participate, I may change my mind and withdraw him/her from taking part in this survey at any time.

I agree to allow you to ask my child to be in this survey. I know that after allowing my child to decide whether he/she wants to be in this survey, he/she may withdraw at any time. His/her participation is voluntary. I have been offered a copy of this permission form.

1. Do you agree for us to ask your child to give blood for HIV testing and related testing? 'YES' means that you give your permission for us to ask your child to have the nurse collect a sample of your child's blood for HIV testing and related testing. 'NO' means that we will NOT ask your child to give blood for HIV testing and related testing.
   _____Yes _____No

(if "Yes" proceed to the next question)

2. Do you agree for us to ask your child to have your child's leftover blood stored for future research?

'YES' means that you give permission for us to ask your child to store your child's blood samples for future research. 'NO' means that you do NOT give us permission to ask your child to store his/her blood samples for future research.

_____Yes _____No

Parent/guardian signature or mark_____ Date:___/___/___

Printed name of parent/guardian_____

Parent/guardian ID number_____(If applicable. If not applicable check here)

[For illiterate participants]

Signature of witness_____ Date:___/___/___

Printed name of witness_____

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

Printed name of person obtaining permission_____

Survey staff ID number _____

Child's name (print) _____

Child's participant ID number _____

Permission for Interview and Blood Draw from Parent/Guardian for Children, ages 15-17 years

Interviewer reads:

What language do you prefer for our discussion today?

____English

____Chichewa

____Tumbuka

Now I would like to ask you to give us permission to invite your son/daughter to take part in the survey.

Title of Survey: Malawi Population-Based HIV Impact Assessment

Purpose of the survey
This research study/survey will help us learn more about the health of children in Malawi. We plan to ask thousands of children like yours to join this survey. We would like to invite your child to join the survey too. Your child's participation will help the Ministry of Health make HIV services better.

Survey Procedures
If you agree to allow us to invite your child to participate in this survey, we will invite him/her to participate and ask your child some questions. The questions are the same as the ones we will ask adults who agree to participate in the survey. It will take about 45 minutes.

If you and your child agree, a trained nurse will take a small amount or about 14 mL of blood from your child's arm and perform an HIV test here in your home. If it is not possible to take blood from your child's arm, then we will try to take a few drops of blood from your child's finger and then perform the HIV test here in your home.
We will give you the results and provide counseling about the results today. We will also discuss with you how to share the results with your child if you decide to discuss the results with him/her. If you would like, we can discuss the test results together with your child. The entire testing and counseling session will take about 40 minutes.

If your child tests positive for HIV, we will also test the amount of CD4 cells in his/her blood and give you the result today. CD4 cells are the part of your immune system that fights HIV infection and other diseases. We will give you a referral form and information so that your child can consult with a doctor or nurse to learn more about his/her HIV test, CD4 counts, and health. We will also test the CD4 level of some people without HIV.

If your child tests positive for HIV, we will also send his/her blood to a laboratory to measure his/her viral load. Viral load is the amount of HIV in the blood. If you or your child provide us with the name of a health facility, we can send your child's viral load results there about six to eight weeks from now.

We will also do other additional tests related to HIV. If we have test results that might guide your child's care or treatment, we will contact you to tell you how you and your child's doctor or nurse may get these results.

We would like to ask your permission to store your child's leftover blood for future research tests. These tests may be about HIV or other issues important for the health of Malawians, such as nutrition or immunization. This sample will be stored for an indefinite amount of time but your child's 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 for your child's health. Your child's leftover blood samples will not be sold or used for commercial reasons. If you do not agree to long-term storage of your child's blood samples, we will destroy your child's blood samples after survey-related testing has been completed.

It is also possible that your child may be eligible to participate in future studies related to health in Malawi. We will also ask your child for permission to contact them in the next two years if such an opportunity occurs.

Right to refuse and to withdraw
It is your decision about whether you will allow us to invite your child to join the survey. Your child does not have to be in the survey. You or your child may stop participation at any time. If your child does not want to answer some of the questions she/he may skip them and move to the next question. If your child does not take part, it will not affect your child's healthcare in any way. If you agree to allow us to invite your child to participate, you and your child will have the option for your child to test for HIV and CD4 counts and the option to have his/her blood stored for future research.

Risks
We will do everything we can to keep your child's information private. However, we cannot promise complete confidentiality. Your child may feel uncomfortable answering some of the questions. We do not wish this to happen, and they do not need to answer any question(s) if they feel the question(s) are too personal or if it makes them feel uncomfortable.

The risks to being in the survey and drawing blood are small. They include brief pain from the needle stick, bruising, lightheadedness, bleeding, and rarely, infection where the needle enters the skin. You may learn that your child is infected with HIV. If you find out that your child is HIV-positive, we will tell you where he/she may go for care and treatment. Care and treatment provided by the Ministry of Health is free. However, learning that your child has HIV may cause some emotional discomfort. You will decide when and where to give your child the test results. We will provide you with counseling on how to cope with learning that your child has HIV.

Benefits
There may be no direct benefit to your child for participating in the interview. The main benefit for your child to be in the survey is the chance to learn more about his/her health today. Some children who participate will test HIV-positive. If this happens to your child, the benefit is that you will learn his/her HIV status and you will learn where to take your child for life-saving treatment. If you already know that your child is HIV-positive and he/she is on treatment, the CD4 and viral load tests can help your child's doctor or nurse judge how well the treatment is working. Your child's taking part in this research could help us learn more about children and HIV in Malawi. It can also help us learn about how HIV prevention and treatment programs are working.

Confidentiality and Access to Your Health Information
We will do everything we can to keep your child's participation in the survey confidential. Your child's name and the permission and assent forms will be kept separate from his/her health information. The information we collect from your child will be identified by a number and not by your name or your child's name. Your name and your child's name will not appear when we share survey results. Only people working on the survey will have access to the data during the survey. Your child may choose to tell you about the interview but she/he does not have to do this. We will not be sharing with you responses given by your child.

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

- Staff members from the Institutional Review Boards or Ethics Committees overseeing the conduct of this survey to ensure that we are protecting your child's rights as a participant. These include the National Health Sciences Research Committee in Malawi (NHSRC) and the Institutional Review Boards at the Centers for Disease Control and Prevention (CDC; Atlanta, USA), Columbia University Medical Center and Westat (a statistical survey research organization)
- The U.S. Office of Human Research Protections and other government agencies that oversee the safety of human subjects to ensure we are protecting your child's rights as a participant in this survey
- Study staff and study monitors

The information we collect from your child will not be released outside of the survey groups listed above unless there is an issue of safety. Your permission to allow us to use and share your child's name and contact information with the groups above will expire three years after the end of the survey. Your child can leave the study at any time for any reason. If you want your child to leave the study, have any questions about the survey, or feel that your child has been harmed by taking part, you should contact the Principal Investigator Dr. George Bello who can be reached at

Address: Ministry of Health, PO Box 30377, Lilongwe, Malawi Phone:
+265888892212
Email: gafbello@yahoo.co.uk

If you or your child decides that he/she should leave the survey, no more information will be collected from him/her. However, we will not be able to take back the information that has already been collected and shared.

Costs for being in the survey
There is no cost to you for your child for being in the survey. You should also know that you and your child would not be paid for your child to be in the survey. If you have any questions about your child's rights as a participant in this survey, you can contact:

Dr. Damson Katyola
Address: Ministry of Health, National Science Research Council, P.O Box 30337, Lilongwe, Malawi
Phone: +2651726422/418
Email: dkathyola@gmail.com

Do you want to ask me anything about the survey?

Permission Statement
I have read this form, and/or someone has read it to me. I was encouraged to ask questions and given time to ask questions. Any questions that I had have been answered satisfactorily. I agree for my child to take part in this survey. I know that after allowing my child to participate, I may change my mind and withdraw him/her from taking part in this survey at any time.

I agree to allow you to ask my child to be in this survey. I know that after allowing my child to decide whether he/she wants to be in this survey, he/she may withdraw at any time. His/her participation is voluntary. I have been offered a copy of this permission form.

1. Do you agree for us to ask your child to do the interview? YES' means that you give your permission to have the survey staff ask your child to do the interview. 'NO' means that you will NOT give permission for us to ask your child to be interviewed.
   _____Yes _____No

(if “Yes” proceed to the next question)

2. Do you agree for us to ask your child to give blood for HIV testing and related testing? ‘YES’ means that you give your permission for us to ask your child to have the nurse collect a sample of your child’s blood for HIV and related testing. ‘NO’ means that we will NOT ask your child to give blood for HIV testing and related testing.
   _____Yes _____No

(if “Yes” proceed to the next question)

3. Do you agree for us to ask your child to have your child’s leftover blood stored for future research. ‘YES’ means that you give permission for us to ask your child to store your child’s leftover blood samples for future research. ‘NO’ means that you do NOT give us permission to ask your child to store his/her blood samples for future research.
   _____Yes _____No

Parent/guardian signature or mark_____ Date:___/___/___

Printed name of parent/guardian_____

Parent/guardian ID number_____

[For illiterate participants]

Signature of witness_____ Date:___/___/___

Printed name of witness_____

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

Printed name of person obtaining permission_____

Survey staff ID number _____

Child’s name (print) _____

Child’s participant ID number _____

Assent for Interview: children, ages 15-17 years

Interviewer reads:

What language do you prefer to use for this discussion?

____English

____Chichewa

____Tumbuka

Hello. My name is_____. I would like to invite you to take part in a survey of Malawi to learn more about HIV in the country.

Title of Survey: Malawi Population-Based HIV Impact Assessment

Purpose of the survey
This research study/survey will help us learn more about the health of children in Malawi. We plan to ask thousands of children like you to join this survey. A survey is a way to learn new information about something by interviewing and testing many people. We would like to invite you to join this survey. Your parent/guardian said it was okay for us to ask you to join the survey.

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

Survey Procedures
If you agree to join, we will ask you questions about your age, your knowledge about HIV, and whether you experienced any behaviors that may increase your risk of HIV. We will ask you to answer these questions without having others present. The interview will take about 40 minutes.

After the interview, we will offer you an HIV test. We will ask you for assent for the HIV test and blood draw and storage for future testing after the interview. The testing and counseling will take about 40 minutes.

Right to refuse or to withdraw
You do not have to be in the survey, and if you choose to join the survey, you may change your mind at any time and stop participating. If you decide not to take part, it will not affect your healthcare in any way and nobody will get upset with you.

Risks and benefits
The risks to being in the survey are small. We will do everything we can to keep your information private. However, we cannot promise complete confidentiality. You may feel uncomfortable about some of the questions we will ask. You can refuse to answer any question. You may not get anything by being in the survey but your taking part in this research could help us learn more about HIV in Malawi. It can also help us learn about how HIV prevention and treatment programs are working. Your participation is important.

Confidentiality
We will do everything we can to keep your participation in the survey and your answers private. Your name and signed assent form will be kept separate from your answers to the questions. Your answers to the questions will

be identified only by the number. Your name will not appear when we share survey results. Only people working on the survey will have access to the data during the survey. You can choose to tell your parent/guardian about the interview. However, we will not share your responses with your parent or guardian.

The following individuals and/or agencies will be able to look at your research records:

- Staff members from the Institutional Review Boards or Ethics Committees overseeing the conduct of this survey to ensure that we are protecting your rights as a participant. These include the National Health Sciences Research Committee in Malawi (NHSRC) and the Institutional Review Boards at the Centers for Disease Control and Prevention (CDC; Atlanta, USA), Columbia University Medical Center and Westat (a statistical survey research organization)
- The U.S. Office of Human Research Protections that may examine the study records to ensure we are protecting your rights as a participant in this survey
- Study staff and study monitors

Costs for being in the survey
There is no cost to you or to your parent/guardian if you take part in this survey. You should also know that you and your parent/guardian would not be paid to be in the survey.

If you have any questions about the survey, feel you have been harmed by taking part, or no longer want to participate in the survey, you can contact:

Dr. George Bello
Address: Ministry of Health, PO Box 30377, Lilongwe, Malawi Phone:
+265888892212
Email: gafbello@yahoo.co.uk

If you have any questions about your rights as a participant in this survey, you can contact:

Dr. Damson Katyola
Address: Ministry of Health, National Science Research Council, P.O Box 30337, Lilongwe, Malawi
Phone: +2651726422/418
Email: dkathyola@gmail.com

Do you want to ask me anything about the survey?
Assent statement
I have read this form, and/or someone has read it to me. I was encouraged to ask questions and given time to ask questions. Any questions that I had were answered satisfactorily. I agree to be in this survey. I know that after choosing to be in this survey, I may withdraw at any time. My participation is voluntary. I have been offered a copy of this assent form.

1. Do you agree to do the interview? 'YES' means that you agree to do the interview. 'NO' means that you will NOT do the interview.
   _____Yes _____No

2. **FUTURE RESEARCH:** It is possible that you may be eligible to participate in future studies related to health in Malawi. We are asking for your permission to contact you in the next two years if such an opportunity occurs. If we contact you, we will give you details about the new study and ask you to sign a separate assent form at that time. You may decide at that time that you do not want to take part in that study.

If you do not wish to be contacted about future studies, it does not affect your involvement in this study. Do you agree to be contacted in the future? 'YES' means that you agree to be contacted in the future if a study opportunity arises. 'NO' means that you will NOT be contacted about future studies.

_____YES _____NO

Participant signature or mark_____ Date:___/___/___

Printed name of participant_____

Participant ID number _____

Printed name of parent/guardian_____

[For illiterate child]

Signature of witness_____ Date:___/___/___

Printed name of witness_____

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

Printed name of person obtaining assent_____

Survey staff ID number _____

Consent for Interview: Emancipated minors, ages 15-17 years

Interviewer reads:
What language do you prefer to use for this discussion?

____English

____Chichewa

____Tumbuka

Hello. My name is_____. I would like to invite you to take part in a survey of Malawi to learn more about HIV in the country.

Title of Survey: Malawi Population-Based HIV Impact Assessment

Purpose of the survey
This research study/survey will help us learn more about the health of children in Malawi. We plan to ask thousands of children like you to join this survey. A survey is a way to learn new information about something by interviewing and testing many people. We would like to invite you to join this survey.

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

Survey Procedures
If you agree to join, we will ask you questions about your age, your knowledge about HIV, and whether you experienced any behaviors that may increase your risk of HIV. We will ask you to answer these questions without having others present. The interview will take about 40 minutes.

After the interview, we will offer you an HIV test. We will ask you for consent for the HIV test and blood draw and storage for future testing after the interview. The testing and counseling will take about 40 minutes.

Right to refuse or to withdraw
You do not have to be in the survey, and if you choose to join the survey, you may change your mind at any time and stop participating. If you decide not to take part, it will not affect your healthcare in any way and nobody will get upset with you.

Risks and benefits
The risks to being in the survey are small. We will do everything we can to keep your information private. However, we cannot promise complete confidentiality. You may feel uncomfortable about some of the questions we will ask. You can refuse to answer any question. You may not get anything by being in the survey but your taking part in this research could help us learn more about HIV in Malawi. It can also help us learn about how HIV prevention and treatment programs are working. Your participation is important.

Confidentiality
We will do everything we can to keep your participation in the survey and your answers private. Your name and signed consent form will be kept separate from your answers to the questions. Your answers to the questions will be identified only by the number. Your name will not appear when we share survey results. Only people working on the survey will have access to the data during the survey.

The following individuals and/or agencies will be able to look at your research records:

- Staff members from the Institutional Review Boards or Ethics Committees overseeing the conduct of this survey to ensure that we are protecting your rights as a participant. These include the National Health Sciences Research Committee in Malawi (NHSRC) and the Institutional Review Boards at the Centers for Disease Control and Prevention (CDC; Atlanta, USA), Columbia University Medical Center and Westat (a statistical survey research organization)
- The U.S. Office of Human Research Protections that may examine the study records to ensure we are protecting your rights as a participant in this survey
- Study staff and study monitors

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

Dr. George Bello
Address: Ministry of Health, PO Box 30377, Lilongwe, Malawi Phone:
+265888892212
Email: gafbello@yahoo.co.uk

If you decide to leave the study, no more information will be collected from you. However, we will not be able to take back the information that has already been collected and shared.

Costs for being in the survey
There is no cost to you for being in the survey. You should also know that you would not be paid to be in the survey.
If you have any questions about your rights as a participant in this survey, you can
contact: Dr. Damson Katyola
Address: Ministry of Health, National Science Research Council, P.O Box 30337, Lilongwe, Malawi
Phone: +2651726422/418
Email: dkathyola@gmail.com

Do you want to ask me anything about the survey?

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

1. Do you agree to do the interview? 'YES' means that you agree to do the interview. 'NO' means that you will NOT do the interview.
   _____Yes _____No

2. **FUTURE RESEARCH:** It is possible that you may be eligible to participate in future studies related to health in Malawi. We are asking for your permission to contact you in the next two years if such an opportunity occurs. If we contact you, we will give you details about the new study and ask you to sign a separate consent form at that time. You may decide at that time that you do not want to take part in that study.

If you do not wish to be contacted about future studies, it does not affect your involvement in this study. Do you agree to be contacted in the future? 'YES' means that you agree to be contacted in the future if a study opportunity arises. 'NO' means that you will NOT be contacted about future studies.

_____YES _____NO

Participant signature or mark_____ Date:___/___/___

Printed name of participant_____

Participant ID number _____

[For illiterate participants]

Signature of witness_____ Date:___/___/___

Printed name of witness_____

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

Printed name of person obtaining consent_____

Survey staff ID number _____

Consent for Blood Draw: Adults ages 18-64 years

Nurse counselor/interviewer reads:
What language do you prefer to use for this discussion?

____English

____Chichewa

____Tumbuka

Hello. My name is_____. I will give you information about testing options in this research study/survey. As a part of this survey, we are giving participants an opportunity to learn about their HIV status. We are also asking people if we can use their blood later in the laboratory for future testing.

Blood draw and HIV testing procedures
If you agree to the HIV testing and blood draw, a trained nurse will take a small amount or about 14 mL of blood from your arm. If it is not possible to take blood from your arm, then we will try to take a few drops of blood from your finger. We will give you the results and provide counseling today. The testing and counseling session will take about 40 minutes.

If you test positive for HIV, we will measure the amount of CD4 cells in your blood. CD4 cells are the part of your immune system that fights HIV infection and other diseases. We will give you the result today and a referral form and information so that you can consult with a nurse or doctor to learn more about the test result and your health.

If you test positive for HIV, we will send your blood to a laboratory to measure your viral load. Viral load is the amount of HIV in your blood. If you provide us with the name of a health facility, we can send your viral load result to the health facility in about six to eight weeks from now. You will be able to talk to a nurse or doctor at the facility about your viral load.

We will also do other additional tests related to HIV. If we have test results that might help guide your care or treatment, we will contact you to tell you how you and your doctor or nurse may get these results.

Storage of specimens
We would also like your permission to store your leftover blood for future research tests. These tests may be about HIV or other health issues important for the health of Malawians, such as nutrition or immunization. This will help the Ministry of Health improve the health of Malawians. 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. Your leftover blood will not be soldor used for commercial reasons. If you do not agree to long-term storage of your blood samples, we will destroy your blood samples after survey-related testing has been completed.

Right to refuse or to withdraw
You do not have to give blood and you are free to change your mind even after you have started the blood draw. You may agree to let us test your blood for HIV and CD4 counts and other lab testing and not agree to have your blood stored for future research tests. If you don't want to give blood, please tell us. If you decide not to take part, it will not affect your healthcare in any way.

Risks

The risks in drawing blood are very small. They include brief pain from the needle stick, bruising, lightheadedness, bleeding, and rarely, infection where the needle enters the skin. The nurse who will take your blood has received training on how to draw blood. If you have any discomfort, bleeding or swelling at the site, please let us know. You may learn that you are infected with HIV. If you find out that you are HIV-positive, we will tell you where you may go for care and treatment. Care and treatment provided by the Ministry of Health is free. However, learning that you have HIV may cause some emotional discomfort. You will receive counseling on how to cope with learning that you have HIV. We will do everything we can to keep your information private.
However, we cannot promise complete confidentiality.

Benefits
The main benefit for you to be in the survey is the chance to learn more about your health today. Some people who participate will test HIV-positive. If you test HIV-positive, the benefit is that you will learn your HIV status and where to go for life-saving treatment. If you already know that you are HIV-positive and you are on HIV treatment, the CD4 and viral load tests can help your nurse or doctor judge how well your treatment is working. If you test HIV-negative, you will learn about what you can do to stat HIV-negative. Your taking part in this research could help us learn more about HIV in Malawi. It can also help us learn about how HIV prevention and treatment programs are working. Your taking part is important.

Confidentiality and Access to Your Health Information
We will do everything we can to keep your answers and test results confidential. The blood we collect from you will be identified by a number and not by your name. Your name and signed informed consent forms will be kept separate from your blood sample and results. Besides you, no one else will know your test results except the people working on the survey.

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

- Staff members from the Institutional Review Boards or Ethics Committees overseeing the conduct of this survey to ensure that we are protecting your rights as a participant. These include the National Health Sciences Research Committee in Malawi (NHSRC) and the Institutional Review Boards at the Centers for Disease Control and Prevention (CDC; Atlanta, USA), Columbia University Medical Center and Westat (a statistical survey research organization)
- The U.S. 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 participant in this survey
- Study staff and study monitors

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

Address: Ministry of Health, PO Box 30377, Lilongwe, Malawi Phone:
+265888892212
Email: gafbello@yahoo.co.uk

If you decide to leave the study, no more information will be collected from you. However, we will not be able to take back the information that has already been collected and shared.

Costs for being in the survey
There is no cost to you for being in the survey. You should also know that you would not be paid to be in the survey.
If you have any questions about your rights as a participant in this survey, you can
contact: Dr. Damson Katyola
Address: Ministry of Health, National Science Research Council, P.O Box 30337, Lilongwe, Malawi
Phone: +2651726422/418
Email: dkathyola@gmail.com

Do you want to ask me anything about:

- Taking your blood for HIV testing?
- Testing in the laboratory?
- Storage of blood for future research testing?

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

1. Do you agree to give blood for HIV testing and related testing? 'YES' means that you agree to give blood for HIV testing and related testing. 'NO' means that you will NOT give blood for HIV testing and related testing.
   _____Yes _____No

(if "Yes" proceed to the next question)

2. Do you agree to have your leftover blood stored for future research? 'YES' means that you agree to have these blood samples stored for future testing. 'NO' means that these blood samples will NOT be stored for future research.
   _____Yes _____No

Participant signature or mark_____ Date:___/___/___

Printed name of participant_____

Participant ID number _____

[For illiterate participants]

Signature of witness_____ Date:___/___/___

Printed name of witness_____

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

Printed name of person obtaining consent_____

Survey staff ID number _____

Assent to Blood Draw from Children, ages 10-14

Nurse counselor/Interviewer reads:
What language do you prefer for our discussion today?

____English

____Chichewa

____Tumbuka

Hello. My name is_____. I would like to invite you to take part in a research study. Research studies help us learn new things.

This form talks about our research and the choice that you have to take part in it. We want you to ask us any questions that you have. You can ask questions any time.

Why are we doing this research?
We are doing this research to help us learn more about the health of children in Malawi. We plan to ask thousands of children like you to join this research. Research is a way to learn new information about something by interviewing and testing many people. We would like to invite you to join this survey. Your parent/guardian said it was okay for us to ask you to join the survey.

This form might have some words in it that you may not understand. Please ask us to explain anything that you do not understand.

What would happen if I join this research?
If you decide to join the research, here is what would happen:

- We will use a needle to take some of your blood from your arm and then we would test your blood for HIV today in your home.
- If you test positive for HIV, we will do another test here at home on the blood we have already collected to measure some cells in your blood that fight HIV and other infections. We will also measure these cells from some children without HIV.
- We will ask you if we can use some of your blood for future research tests. These tests may be about HIV or other health issues important for the health of Malawians, such as nutrition or immunization. This sample will be stored for an indefinite amount of time but your name will be on it for only three years. We will try to tell your parents/guardians about any test results during the three year period that are important to your health. Your leftover blood will not be sold or used for commercial reasons. If you do not agree to future storage and testing of your blood, we will destroy your blood after survey-related testing has finished.

Will any part of the survey hurt or have any risks?
The needle may hurt when it is put into and taken out of your arm. This will go away after a while. Sometimes the needle can leave a bruise on the skin. You might bleed a little or feel a little dizzy afterwards. Rarely, an infection might occur where the needle enters the skin. And sometimes we may have to stick you with the needle more than one time in order to get the right amount of blood. We will do our best to make it hurt as little as possible. We will do everything we can to keep your information private. However, we cannot promise complete confidentiality.

You can say ‘no’ to what we ask you to do for the research at any time and we will stop.

Could the research help me?
This research might help you. If you are HIV-positive, we will tell your parent/guardian where to get help. The treatment for HIV is free. We also hope to learn something from this research to help other children in Malawi.

What else should I know about this research?
If you don't want to be in the study, you don't have to be. Nobody will get upset if you do not want to be in the study. You can say 'yes' and change your mind later. You can stop being in the research at any time. If you want to stop, please tell us.

We will not tell other people that you are in this research and will not share information about you to anyone who does not work in the research study. Any information about you will have a number on it instead of your name.

We will not share your results with anyone else besides your parent/guardian. We would give your results to your parent/guardian and they would decide on the best time to tell you the result. If your parent wants us to tell you about your test results, we would talk with you about any questions or worries that you might have about the results.

The following individuals and/or agencies will be able to look at your research records:

- Study staff and study monitors
- Staff members from groups that protect your rights as a survey participant to ensure that we are protecting your rights as a participant

Costs for being in the survey
There is no cost to you or your parent/guardian for you being in the survey. You should also know that you and your parent/guardian will not be paid for you to be in the survey.

If you have any questions about the survey, feel that you have been harmed by taking part, or no longer want to participate in the survey, you can contact:

Dr. George Bello
Address: Ministry of Health, PO Box 30377, Lilongwe, Malawi Phone:
+265888892212
Email: gafbello@yahoo.co.uk

If you have any questions about your rights as a participant in this survey, you can contact:

Dr. Damson Katyola
Address: Ministry of Health, National Science Research Council, P.O Box 30337, Lilongwe, Malawi
Phone: +2651726422/418
Email: dkathyola@gmail.com

You can ask questions any time. Ask us any questions you have. Take the time you need to make your choice.

Do you want to ask me anything?
Is there anything else?

If you want to get an HIV test and give your blood for research after we talk, please write your name below. We will write our name too. This shows we talked about the research and that you want to take part.

1. Do you agree to give blood for HIV testing and related testing? 'YES' means you want HIV testing and related testing. 'NO' means you do not want HIV testing and related testing.
   _____Yes _____No

(if "Yes" proceed to the next question)

2. Do you agree to give your blood for future research? 'YES' means we can use some of your blood for future research. 'NO' means we cannot use some of your blood for future research.
   _____Yes _____No

Child signature or mark_____ Date:___/___/___

Printed name of child _____

Child's participant ID number _____

Printed name of parent/guardian_____

[For illiterate child]

Signature of witness_____ Date:___/___/___

Printed name of witness_____

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

Printed name of person obtaining assent_____

Survey staff ID number _____

Blood Draw Consent for emancipated minors, ages 10-14

Nurse counselor/Interviewer reads:
What language do you prefer for our discussion today?

____English

____Chichewa

____Tumbuka

Hello. My name is_____. I would like to invite you to take part in a research study. Research studies help us learn new things.

This form talks about our research and the choice that you have to take part in it. We want you to ask us any questions that you have. You can ask questions any time.

Why are we doing this research?
We are doing this research to help us learn more about the health of children in Malawi. We plan to ask thousands of children like you to join this research. Research is a way to learn new information about something by interviewing and testing many people. We would like to invite you to join this survey.

This form might have some words in it that you may not understand. Please ask us to explain anything that you do not understand.

What would happen if I join this research?
If you decide to join the research, here is what would happen:

- We will use a needle to take some of your blood from your arm and then we would test your blood for HIV today in your home.
- If you test positive for HIV, we will do another test here at home on the blood we have already collected to measure some cells in your blood that fight HIV and other infections. We will also measure these cells from some children without HIV.
- We will ask you if we can use some of your blood for future research tests. These tests may be about HIV or other health issues important for the health of Malawians, such as nutrition or immunization. This sample will be stored for an indefinite amount of time but your name will be on it 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. Your leftover blood will not be sold or used for commercial reasons. If you do not agree to future storage and testing of your blood, we will destroy your blood after survey-related testing has finished.

Will any part of the survey hurt or have any risks?
The needle may hurt when it is put into and taken out of your arm. This will go away after a while. Sometimes the needle can leave a bruise on the skin. You might bleed a little or feel a little dizzy afterwards. Rarely, an infection might occur where the needle enters the skin. And sometimes we may have to stick you with the needle more than one time in order to get the right amount of blood. We will do our best to make it hurt as little as possible. We will do everything we can to keep your information private. However, we cannot promise complete confidentiality.

You can say ‘no’ to what we ask you to do for the research at any time and we will stop.

Could the research help me?

This research might help you. If you are HIV-positive, we will tell you where to get help. The treatment for HIV is free. We also hope to learn something from this research to help other children in Malawi.

What else should I know about this research?
If you don't want to be in the study, you don't have to be. Nobody will get upset if you do not want to be in the study. You can say 'yes' and change your mind later. You can stop being in the research at any time. If you want to stop, please tell us.

We will not tell other people that you are in this research and will not share information about you to anyone who does not work in the research study. Any information about you will have a number on it instead of your name.

We will give you your results and we will not share them with anyone else. We will talk with you about any questions or worries that you might have about the results.

The following individuals and/or agencies will be able to look at your research records:

- Study staff and study monitors
- Staff members from groups that protect your rights as a survey participant to ensure that we are protecting your rights as a participant

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

Address: Ministry of Health, PO Box 30377, Lilongwe, Malawi Phone:
+265888892212
Email: gafbello@yahoo.co.uk

If you decide to leave the study, no more information will be collected from you. However, we will not be able to take back the information that has already been collected and shared.

Costs for being in the survey
There is no cost to you for being in the survey. You should also know that you would not be paid to be in the study.
If you have any questions about your rights as a participant in this survey, you can
contact: Dr. Damson Katyola
Address: Ministry of Health, National Science Research Council, P.O Box 30337, Lilongwe, Malawi
Phone: +2651726422/418
Email: dkathyola@gmail.com

You can ask questions any time. Ask us any questions you have. Take the time you need to make your choice.

Do you want to ask me anything?
Is there anything else?

If you want to get an HIV test and give your blood for research after we talk, please write your name below. We

will write our name too. This shows we talked about the research and that you want to take part.

1. Do you agree to give blood for HIV testing and related testing? 'YES' means you want HIV testing and related testing. 'NO' means you do not want HIV testing and related testing.
   _____Yes _____No

(if "Yes" proceed to the next question)

2. Do you agree to give your blood for future research? 'YES' means we can use some of your blood for future research. 'NO' means we cannot use some of your blood for future research.
   _____Yes _____No

Participant signature or mark_____ Date:___/___/___

Printed name of participant _____

Participant ID number _____

[For illiterate participant]

Signature of witness_____ Date:___/___/___

Printed name of witness_____

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

Printed name of person obtaining consent_____

Survey staff ID number _____

Assent for Blood Draw: Children, ages 15-17 years

Nurse counselor/Interviewer reads:
What language do you prefer to use for this discussion?

____English

____Chichewa

____Tumbuka

Hello. My name is_____. I will give you information about testing options in this research study/survey.

As a part of this survey, we are giving those that take part an opportunity to learn about their HIV status. We are also asking people if we can use their blood later in the laboratory for future testing.

Blood draw and HIV testing procedures
If you agree to the HIV testing and blood draw, a trained nurse will take a small amount or about 14 mL of blood from your arm. If it's not possible to take blood from your arm, then we will try to take a few drops of blood from your finger. We will give your results and provide counseling to your parent/guardian today, and to you if your parent/guardian agrees. The testing and counseling session will take about 40 minutes.

If you test positive for HIV, we will measure the amount of CD4 cells in your blood. CD4 cells are the part of your immune system that fights HIV infection and other diseases. We will give you and your parent/guardian the result today and a referral form and information so that you can consult with a doctor or nurse to learn more about the test result and your health. We will also test the CD4 level of some people without HIV.

If you test positive for HIV, we will send your blood to a laboratory to measure your viral load. Viral load is the amount of HIV in your blood. If you or your parent/guardian provide us with the name of a health facility, we can send your viral load result there in about six to eight weeks from now. You and your parent/guardian will be able to talk to a doctor or nurse at a treatment facility about your viral load.

We will also do additional tests related to HIV. If we have test results that might help guide your care or treatment, we will contact your parent to tell them how you and your doctor or nurse may get these results.

Storage of Specimens
We would also like your permission to store your leftover blood for future research tests. These tests may be about HIV or other health issues important for the health of Malawians, such as nutrition or immunization. This will help the Ministry of Health improve the health of Malawians. This sample will be stored for an indefinite amount of time but your name will be on it for only three years. We will try to tell your parents/guardians about any test results during the three year period that are important to your health. Your leftover blood will not be sold or used for commercial reasons. If you do not agree to long-term storage of your blood samples, we will destroy your blood samples after survey-related testing has been completed.

Right to refuse and to withdraw
You do not have to give blood and you are free to change your mind even after you have started the blood draw. You may agree to let us test your blood for HIV and CD4 counts and other lab testing and not agree to have your blood stored for future research tests. If you don't want to give blood, please tell us. If you decide not to take part, it will not affect your healthcare in any way.

Risks
The risks in drawing blood are very small. They include brief pain from the needle stick, bruising, lightheadedness, bleeding, and rarely, infection where the needle enters the skin. The nurse who will take your blood has received training on how to draw blood. If you have any discomfort, bleeding or swelling at the site, please let us know. You may learn that you are infected with HIV. If you find out that you are HIV-positive, we will tell you where you may go for care and treatment. Care and treatment provided by the Ministry of Health is free. However, learning that you have HIV may cause you to feel worried. We will talk to you about how to feel less worried. We will do everything we can to keep your information private. However, we cannot promise complete confidentiality.

Benefits
The main benefit for you to be in the survey is the chance to learn more about your health today. Some people who participate will test HIV-positive. If you test HIV-positive, the benefit is that you will learn your HIV status and where to go for life-saving treatment. If you already know that you are HIV-positive and you are on HIV treatment, the CD4 and viral load tests can help your doctor or nurse judge how well your treatment is working. If you test HIV-negative, you will learn about what you can do to stay HIV-negative. Your taking part in this research could help us learn more about HIV in Malawi. It can also help us learn about how HIV prevention and treatment programs are working. Your taking part is important.

Confidentiality
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. Your name and signed assent forms will be kept separate from your blood sample and results. Besides you and your guardian/parent, no one else will know your test results except the people working on the survey.

People from some organizations will be able to look at your research records. They do this in order to check that this survey is being carried out the right way. These organizations are:

- Staff members from the Institutional Review Boards or Ethics Committees overseeing the conduct of this survey to ensure that we are protecting your rights as a participant. These include the National Health Sciences Research Committee in Malawi (NHSRC) and the Institutional Review Boards at the Centers for Disease Control and Prevention (CDC; Atlanta, USA), Columbia University Medical Center and Westat (a statistical survey research organization)
- The U.S. Office of Human Research Protections that may examine the study records to ensure we are protecting your rights as a participant in this survey
- Study staff and study monitors

Costs for being in the survey
There is no cost to you or your parent/guardian for you being in the survey. You should also know that you and your parent/guardian will not be paid for you to be in the survey.

If you have any questions about the survey, feel that you have been harmed by taking part, or no longer want to participate in the survey, you can contact:

Dr. George Bello
Address: Ministry of Health, PO Box 30377, Lilongwe, Malawi Phone:
+265888892212
Email: gafbello@yahoo.co.uk

If you have any questions about your rights as a participant in this survey, you can contact:

Dr. Damson Katyola
Address: Ministry of Health, National Science Research Council, P.O Box 30337, Lilongwe, Malawi
Phone: +2651726422/418
Email: dkathyola@gmail.com

Do you want to ask me anything about:

- Taking your blood for HIV testing?
- Testing in the laboratory?
- Storage of blood for future research testing?

Assent statement

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

1. Do you agree to give blood for HIV testing and related testing? 'YES' means that you agree to give blood for HIV testing and related testing. 'NO' means that you will NOT give blood for HIV testing and related testing.
   _____Yes _____No

(if "Yes" proceed to the next question)

2. Do you agree to have your leftover blood stored for future research.? 'YES' means that you agree to have these blood samples stored for future research. 'NO' means that these blood samples will NOT be stored for future research.
   _____Yes _____No

Participant signature or mark_____ Date:___/___/___

Printed name of participant_____

Participant ID number _____

Printed name of parent/guardian_____

[For illiterate child]

Signature of witness_____ Date:___/___/___

Printed name of witness_____

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

Printed name of person obtaining assent_____

Survey staff ID number _____

Consent for Blood draw for Emancipated minors, ages 15-17 years

Nurse counselor/Interviewer reads:
What language do you prefer to use for this discussion?

____English

____Chichewa

____Tumbuka

Hello. My name is_____. I will give you information about testing options in this research study/survey.

As a part of this survey, we are giving those that take part an opportunity to learn about their HIV status. We are also asking people if we can use their blood later in the laboratory for future testing.

Blood draw and HIV testing procedures
If you agree to the HIV testing and blood draw, a trained nurse will take a small amount or about 14 mL of blood from your arm. If it's not possible to take blood from your arm, then we will try to take a few drops of blood from your finger. We will give you the results today and provide counseling today.The testing and counseling session will take about 40 minutes.

If you test positive for HIV, we will measure the amount of CD4 cells in your blood. CD4 cells are the part of your immune system that fights HIV infection and other diseases. We will give you the result today and a referral form and information so that you can consult with a doctor or nurse to learn more about the test result and your health. We will also test the CD4 level of some people without HIV.

If you test positive for HIV, we will also send your blood to a laboratory to measure your viral load. Viral load is the amount of HIV in your blood. If you provide us with the name of a health facility, we can send your viral load result there in about six to eight weeks from now. You will be able to talk to a doctor or nurse at a treatment facility about your viral load.

We will also do additional tests related to HIV. If we have test results that might help guide your care or treatment, we will contact you to tell you how you and your doctor or nurse may get these results.

Storage of Specimens
We would also like your permission to store your leftover blood for future research tests. These tests may be about HIV or other health issues important for the health of Malawians, such as nutrition or immunization. This will help the Ministry of Health improve the health of Malawians. This sample will be stored for an indefinite amount of time but your name will be on it 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. Your leftover blood will not be sold or used for commercial reasons. If you do not agree to long-term storage of your blood samples, we will destroy your blood samples after survey-related testing has been completed.

Right to refuse and to withdraw
You do not have to give blood and you are free to change your mind even after you have started the blood draw. You may agree to let us test your blood for HIV and CD4 counts and other lab testing and not agree to have your blood stored for future research tests. If you don't want to give blood, please tell us. If you decide to not take part, it will not affect your healthcare in any way.

Risks
The risks in drawing blood are very small. They include brief pain from the needle stick, bruising, lightheadedness, bleeding, and rarely, infection where the needle enters the skin. The nurse who will take your blood has received training on how to draw blood. If you have any discomfort, bleeding or swelling at the site, please let us know. You may learn that you are infected with HIV. If you find out that you are HIV-positive, we will tell you where you may go for care and treatment. Care and treatment provided by the Ministry of Health is free. However, learning that you have HIV may cause you to feel worried. We will talk to you about how to feel less worried. We will do everything we can to keep your information private. However, we cannot promise complete confidentiality.

Benefits
The main benefit for you to be in the survey is the chance to learn more about your health today. Some people who participate will test HIV-positive. If you test HIV-positive, the benefit is that you will learn your HIV status and where to go for life-saving treatment. If you already know that you are HIV-positive and you are on HIV treatment, the CD4 and viral load tests can help your doctor or nurse judge how well your treatment is working. If you test HIV-negative, you will learn about what you can do to stay HIV-negative. Your taking part in this research could help us learn more about HIV in Malawi. It can also help us learn about how HIV prevention and treatment programs are working. Your taking part is important.

Confidentiality
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. Your name and signed consent forms will be kept separate from your blood sample and results. Besides you, no one else will know your test results except the people working on the survey.

People from some organizations will be able to look at your research records. They do this in order to check that this survey is being carried out the right way. These organizations are:

- Staff members from the Institutional Review Boards or Ethics Committees overseeing the conduct of this survey to ensure that we are protecting your rights as a participant. These include the National Health Sciences Research Committee in Malawi (NHSRC) and the Institutional Review Boards at the Centers for Disease Control and Prevention (CDC; Atlanta, USA), Columbia University Medical Center and Westat (a statistical survey research organization)
- The U.S. Office of Human Research Protections that may examine the study records to ensure we are protecting your rights as a participant in this survey
- Study staff and study monitors

The information we collect during the survey will not be released outside of the survey groups listed above unless there is an issue of safety. Your permission to allow us to use and share your information with the groups above will expire three years after the end of the survey. You can leave

the study at any time for any reason. If you want to leave the study, have any questions about the survey, or feel that you have been harmed by taking part, you should contact the Principal Investigator Dr. George Bello who can be reached at

Address: Ministry of Health, PO Box 30377, Lilongwe,
Malawi Phone: +265888892212
Email: gafbello@yahoo.co.uk

If you decide to leave the study, no more information will be collected from you. However, we will not be able to take back the information that has already been collected and shared.

Costs for being in the survey
There is no cost to you for being in the survey. You should also know that you would not be paid to be in the survey.

If you have any questions about your rights as a participant in this survey, you can contact: Dr. Damson Katyola
Address: Ministry of Health, National Science Research Council, P.O Box 30337, Lilongwe,
Malawi Phone: +2651726422/418
Email: dkathyola@gmail.com

Do you want to ask me anything about:

- Taking your blood for HIV testing?
- Testing in the laboratory?
- Storage of blood for future research testing?

Consent statement

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

1. Do you agree to give blood for HIV testing and related testing? 'YES' means that you agree to give blood for HIV testing and related testing. 'NO' means that you will NOT give blood for HIV testing and related testing.
   _____Yes _____No

(if "Yes" proceed to the next question)

2. Do you agree to have your leftover blood stored for future research? 'YES' means that you agree to have these blood samples stored for future research. 'NO' means that these blood samples will NOT be stored for future research.
   _____Yes _____No

Participant signature or mark_____ Date:___/___/___

Printed name of participant_____

Participant ID number _____

[For illiterate participants]

Signature of witness_____ Date:___/___/___

Printed name of witness_____

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

Printed name of person obtaining consent_____

Survey staff ID number _____