

# ZAMBIA POPULATION-BASED HIV IMPACT ASSESSMENT **ZAMPHIA 2016**



**FIRST REPORT**  
DECEMBER 2017



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# CONTENTS

<b>Glossary of Terms .....</b>	<b>4</b>
<b>List of Abbreviations.....</b>	<b>5</b>
<b>List of Tables and Figures.....</b>	<b>6</b>
<b>Summary of Key Findings .....</b>	<b>7</b>
<b>Introduction.....</b>	<b>8</b>
1.1 Background .....	8
1.2 Overview of ZAMPHIA 2016 .....	8
1.3 Specific Objectives .....	8
<b>Design and Methods.....</b>	<b>10</b>
2.1 Sample Frame and Design .....	10
2.2 Eligibility Criteria, Recruitment, and Consent Procedures.....	11
2.3 Survey Implementation.....	12
2.4 Field-Based Biomarker Testing .....	13
2.5 Laboratory-Based Biomarker Testing.....	16
2.6 Data Processing and Analysis.....	18
<b>Results .....</b>	<b>20</b>
3.1 Response Rates .....	20
3.2 Characteristics of Households and Respondents .....	22
3.3 HIV Incidence, HIV Prevalence, and Immunosuppression .....	28
3.4 90-90-90 Indicators.....	40
3.5 Prevention of Mother-to-Child Transmission of HIV.....	57
3.6 Sexual Behavior .....	63
3.7 Additional Selected Indicators.....	70
<b>Conclusion .....</b>	<b>76</b>
<b>References.....</b>	<b>77</b>
<b>Appendix.....</b>	<b>78</b>

# GLOSSARY OF TERMS

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

**Acquired immunodeficiency syndrome (AIDS):** AIDS is a disease caused by infection with the human immunodeficiency virus. 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 drugs that inhibit the ability of HIV to multiply in the body, leading to improved health and survival among HIV-infected persons.

**CD4+ T cells:** CD4+ T cells 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+ T cells leaving the body vulnerable to a wide range of infections. The CD4+ T-cell 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 Population:** Individuals who spent the night at the household, the night prior to the survey

**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+ T cells in the body, leaving the infected 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 occurring during a given time period.

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

**HIV viral load:** The concentration of HIV in the blood, usually expressed as copies per milliliter.

**HIV viral load suppression:** An HIV viral load of less than 1,000 copies per milliliter.

# LIST OF ABBREVIATIONS

<b>AIDS</b>	<b>Acquired immunodeficiency syndrome</b>
<b>ANC</b>	<b>Antenatal care</b>
<b>ART</b>	<b>Antiretroviral therapy</b>
<b>ARV</b>	<b>Antiretroviral</b>
<b>CDC</b>	<b>U.S. Centers for Disease Control and Prevention</b>
<b>CI</b>	<b>Confidence interval</b>
<b>CSO</b>	<b>Central Statistics Office</b>
<b>DNA</b>	<b>Deoxyribonucleic acid</b>
<b>EID</b>	<b>Early infant diagnosis</b>
<b>HIV</b>	<b>Human immunodeficiency virus</b>
<b>HBTC</b>	<b>Home-based testing and counseling</b>
<b>MOH</b>	<b>Ministry of Health</b>
<b>NAC</b>	<b>National HIV/AIDS/STI/TB Council</b>
<b>ODn</b>	<b>Normalized optical density</b>
<b>LA<sub>g</sub></b>	<b>Limiting antigen</b>
<b>PEPFAR</b>	<b>U.S. President's Emergency Plan for AIDS Relief</b>
<b>PHIA</b>	<b>Population-Based HIV Impact Assessment</b>
<b>PLHIV</b>	<b>People living with HIV</b>
<b>PMTCT</b>	<b>Prevention of mother-to-child transmission of HIV</b>
<b>RNA</b>	<b>Ribonucleic acid</b>
<b>TDRC</b>	<b>Tropical Diseases Research Centre</b>
<b>UNAIDS</b>	<b>Joint United Nations Programme on HIV/AIDS</b>
<b>UNZA</b>	<b>University of Zambia</b>
<b>VLS</b>	<b>Viral load suppression</b>
<b>ZAMPHIA</b>	<b>Zambia Population-Based HIV Impact Assessment</b>
<b>ZNPHI</b>	<b>Zambian National Public Health Institute</b>



# LIST OF TABLES AND FIGURES

Table 2.1.A	Distribution of sampled enumeration areas and households, by province, ZAMPHIA 2016
Figure 2.4.A	Household-based HIV-testing algorithm
Figure 2.5.A	HIV recent-infection testing algorithm
Table 3.1.A	Results of the household interviews
Table 3.1.B	Results of the individual interviews and blood draws
Figure 3.2.A	Distribution of the de facto population by sex and age, ZAMPHIA 2016
Table 3.2.A	Household composition
Table 3.2.B	Age and sex distribution of the de facto household population
Table 3.2.C	Demographic characteristics of the respondent population
Table 3.2.D	Demographic characteristics of the adolescent respondent population
Figure 3.3.A	HIV prevalence among persons ages 0-59, by sex and age
Figure 3.3.B	HIV prevalence among adults ages 15-59, by province (map)
Figure 3.3.C	HIV prevalence among adults ages 15-59, by province (bar graph)
Figure 3.3.D	CD4 T-cell count distributions among HIV-positive adults ages 15-59, by ART status
Table 3.3.A	Annual HIV incidence
Table 3.3.B	HIV prevalence by demographic characteristics: Ages 15-49
Table 3.3.C	HIV prevalence by demographic characteristics: Ages 15-59
Table 3.3.D	HIV prevalence by age
Table 3.3.E	Median CD4 count and prevalence of immunosuppression
Figure 3.4.A	Self-reported HIV testing in the last 12 months, by sex and age
Figure 3.4.B	Viral load suppression among persons living with HIV ages 0-59, by sex and age
Figure 3.4.C	Viral load suppression among HIV-positive adults ages 15-59, by province (map)
Figure 3.4.D	Viral load suppression among HIV-positive adults ages 15-59, by province (bar graph)
Figure 3.4.E	Progress toward the 90-90-90 goals among PLHIV ages 15-59, by sex
Table 3.4.A	HIV testing: Males
Table 3.4.B	HIV testing: Females
Table 3.4.C	HIV treatment status: Males
Table 3.4.D	HIV treatment status: Females
Table 3.4.E	Viral load suppression prevalence by demographic characteristics
Table 3.4.F	Viral load suppression prevalence by age
Table 3.4.G	90-90-90: Conditional percentages
Table 3.5.A	Antenatal care
Table 3.5.B	Prevention of mother-to-child transmission: Known HIV status
Table 3.5.C	Prevention of mother-to-child transmission: HIV-positive pregnant women who received antiretroviral therapy
Table 3.5.D	Prevention of mother-to-child transmission: Infant virologic test
Table 3.5.E	Breastfeeding status by child's age and mother's HIV status
Table 3.6.A	HIV prevalence by sexual behavior
Table 3.6.B	Sex before the age of 15
Table 3.6.C	Condom use at last sex with a nonmarital, noncohabitating partner: Males
Table 3.6.D	Condom use at last sex with a nonmarital, noncohabitating partner: Females
Table 3.7.A	Syphilis prevalence
Table 3.7.B	Hepatitis B surface antigen prevalence by HIV status
Table 3.7.C	Viral load suppression and severe immunosuppression

## SUMMARY OF KEY FINDINGS

- Annual incidence of HIV among adults ages 15-59 in Zambia is 0.67%: 1.02% among females and 0.32% among males. This corresponds to approximately 47,000 new cases of HIV infection annually among adults ages 15-59 in Zambia.
- Prevalence of HIV infection among adults ages 15-59 in Zambia is 12.0%: 14.6% among females and 9.3% among males. This corresponds to approximately 960,000 people with HIV ages 15-59 in Zambia.
- Prevalence of HIV infection among children aged 0-14 years in Zambia is 1.1%.
- In Zambia, 66.0% of people living with HIV (PLHIV) ages 15-59 report knowing their HIV status: 68.3% of HIV-positive females and 62.2% of HIV-positive males.
- Among PLHIV ages 15-59 who knew their HIV status, 85.0% self-reported current use of antiretroviral therapy (ART): 84.4% of HIV-positive females and 86.2% of HIV-positive males.
- Prevalence of viral load suppression—defined as HIV RNA < 1,000 copies/milliliter—among HIV-positive adults ages 15-59 in Zambia is 59.1%: 60.3% among females and 57.1% among males.
- Among PLHIV ages 15-59 who self-report current use of ART, 89.3% are virally suppressed: 90.1% of HIV-positive females and 87.7% of HIV-positive males are virally suppressed.
- The median CD4 count among HIV-positive participants ages 15-59 is 421 cells per microliter ( $\mu$ L) and nearly two-thirds of them (64.3%) are immunosuppressed (CD4 count < 500 cells/ $\mu$ L).
- The median CD4 count is highest among HIV-positive participants ages 15-19 (492 cells/ $\mu$ L), while HIV-positive participants ages 55-59 have the lowest median CD4 count (384 cells/ $\mu$ L).
- Overall, lifetime syphilis prevalence among participants ages 15-59 is 6.8%. However, prevalence of ever-infected syphilis is lower among HIV-negative (5.5%) than among HIV-positive (16.6%) participants.
- Overall, the prevalence of active syphilis among participants ages 15-59 is 3.0%. However, prevalence of active syphilis is lower among HIV-negative (2.1%) than among HIV-positive (9.6%) participants.

# INTRODUCTION

## 1.1 Background

The Population-Based HIV Impact Assessment (PHIA) Project is a multicountry project funded by the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) whose objective is to conduct national HIV-focused surveys that describe the status of the HIV epidemic. The surveys will measure important national and regional HIV-related parameters, including progress toward the achievement of the 90-90-90 goals, and will guide policy and funding priorities.

## 1.2 Overview of ZAMPHIA 2016

The Zambia Population-Based HIV Impact Assessment (ZAMPHIA), a household-based national survey, was conducted between March and August 2016 to measure the status of Zambia's national HIV response. ZAMPHIA offered HIV counseling and testing with return of results and collected information about uptake of HIV care and treatment services.

This survey is the first in Zambia to measure national HIV incidence, viral load suppression (VLS), and pediatric HIV prevalence. The results provide information on national and subnational progress toward control of the HIV epidemic and Zambia's progress toward the Joint United Nations Programme on HIV/AIDS (UNAIDS) 90-90-90 treatment targets. ZAMPHIA was led by the government of the Republic of Zambia through the Ministry of Health (MOH) and conducted with funding from PEPFAR and with technical assistance through the U.S. Centers for Disease Control and Prevention (CDC). The survey was implemented by ICAP at Columbia University in collaboration with the statistical survey research corporation Westat and local partners, including the Central Statistical Office (CSO), Tropical Diseases Research Centre (TDRC), University of Zambia (UNZA), and the University Teaching Hospital (UTH).

Multiple HIV-related measures, such as CD4 T-cell count distribution, prevalence of detectable antiretrovirals (ARVs), and HIV drug resistance were also assessed to characterize the HIV epidemic in Zambia and provide greater clarity on the impact of the national HIV program. Some of these measures will not appear in this report but will be incorporated in the final ZAMPHIA report. In addition, the survey collected information on selected behaviors typically associated with HIV acquisition and transmission and on common HIV comorbidities and other health conditions.

## 1.3 Specific Objectives

The objective of the survey was to examine the distribution of HIV in Zambia, to assess the coverage and impact of HIV services at the population level, and to measure HIV-related risk behaviors using a nationally representative sample of adults and children.



### *Primary Objectives*

- To estimate the national rate of new HIV infections (incidence) among adults ages 15-59 years.
- To estimate the provincial level prevalence of HIV VLS, defined as HIV RNA < 1,000 copies/milliliter (mL), among HIV-positive adults ages 15-59 years.

### *Secondary Objectives*

- To estimate the national and provincial level prevalence of HIV infection for adults ages 15-59 years.
- To estimate the prevalence of HIV-related knowledge and risk behaviors for adults ages 15-59 years.
- To estimate syphilis antibody prevalence among adults ages 15-59 years.
- To estimate the prevalence of hepatitis B infection among adults and children ages 0-59 years.
- To estimate the national prevalence of HIV infection among children ages 0-14 years.
- To describe the uptake of HIV-related services, especially prevention of mother-to-child transmission of HIV (PMTCT) services.
- To determine the distribution of CD4 T-cell counts in HIV-positive persons ages 0-59 years.

# DESIGN AND METHODS

## 2.1 Sampling Frame and Design

ZAMPHIA 2016 was a nationally representative cross-sectional population-based survey of households across Zambia. The survey used a two-stage stratified cluster sample design, where the first stage selected 511 enumeration areas from the 2010 Census of Population and Housing in Zambia, using a probability proportional to size method. The second stage randomly selected a sample of households in each enumeration area (cluster) using an equal probability method, where the average number of households selected per cluster was 27 and the actual number of households selected per cluster ranged from 11 to 48. The sampling frame for the second stage was defined based on a household listing exercise conducted from August to September 2015, prior to the initiation of data collection.

The sample size of selected households was calculated to provide a representative national estimate of HIV incidence among adults ages 15-59 with a relative standard error less than or equal to 31.2%, as well as representative provincial estimates of VLS prevalence among HIV-positive adults ages 15-59 with 95% confidence intervals (CIs)  $\pm 11\%$ . One-half of households were randomly selected for inclusion of children ages 0-14, which was designed to provide a representative national estimate of pediatric HIV prevalence with a relative standard error  $\leq 14.6\%$ . The target sample size was 19,168 for adults ages 15-59, and 8,974 for children ages 0-14 years.

**Table 2.1.A Distribution of sampled enumeration areas and households, by province, ZAMPHIA 2016**

Region	Enumeration areas			Households		
	Urban	Rural	Total	Urban	Rural	Total
Central	10	32	42	255	842	1097
Copperbelt	60	14	74	1621	311	1932
Eastern	6	43	49	130	1147	1277
Luapula	6	26	32	159	676	835
Lusaka	69	16	85	1860	381	2241
Muchinga	8	42	50	258	1050	1308
Northern	8	35	43	233	941	1174
North-Western	9	40	49	297	1008	1305
Southern	15	40	55	414	1022	1436
Western	3	29	32	120	716	836
Total	194	317	511	5347	8094	13441

## 2.2 Eligibility Criteria, Recruitment, and Consent Procedures

Participants were eligible if they were literate in one of the survey languages, or could provide a literate witness and were willing and cognitively able to provide consent. The eligible survey population included:

- children ages 0-9 living in residential households, and child visitors who slept in the household the night before the survey whose parents or guardians were able to provide consent for their participation.
- young people ages 10-17 living in residential households, and young visitors who slept in the household the night before the survey, willing and able to provide assent and whose parents or guardians provided permission.
- women and men ages 18-59 living in residential households, and visitors who slept in the household the night before the survey, who were able to provide consent in one of the eight survey languages (English, Bemba, Nyanja, Lozi, Tonga, Lunda, Luvale, or Kaonde).

A designated head of household provided written consent for household members to participate in the survey on an electronic informed consent form administered using a tablet. Individual members were then rostered during a household interview. Persons ages 15-59 (note that parental permission and participant assent were obtained for 15- to 17-year-olds) and emancipated minors then provided written consent for an interview on the tablet. After completing the interview, they provided written consent for participation in the biomarker component of the survey, which included home-based testing and counseling (HBTC) for HIV, hepatitis B (for all participants), and syphilis (for persons ages 15-59) with return of HIV test results during the household visit. In addition, CD4 counts were measured for those who tested HIV positive. If an individual did not want to receive his or her HIV test result, it was considered a refusal and the survey was stopped. Adults were also asked for written consent for their blood samples to be stored in a repository for

future testing. 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.

Adolescents ages 10-14 were asked for assent to the interview and biomarker components after permission was granted by their parents or guardians. Parents or guardians provided consent directly for minors below the age of assent (0-9 years). Procedures with nonliterate 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 illiterate) was deemed ineligible.

## **2.3 Survey Implementation**

### ***Survey Staff***

Field work started on March 1, 2016, and was completed by August 31, 2016. A total of 47 field teams conducted the survey; however, at any given time, there was a maximum of 37 teams in the field. Each team was composed of one team leader, two interviewers, two nurse counselors, one midwife, and one laboratory technician. Survey personnel were selected based on local language proficiency and profession. While all survey personnel had the responsibility of obtaining consent and administering the interview, nurse counselors, midwives, and laboratory technicians also conducted phlebotomy and other duties as needed. In addition, nurse counselors and midwives provided adult and pediatric HIV counseling.

Over 40 laboratory staff processed samples and performed additional tests for HIV-1 viral load, infant virologic testing, and quality control. Teams were supervised by three or four provincial supervisors at a time, along with 40 rotating field monitors who performed spot-checks of teams in the field, providing technical support and assistance where needed. National and international monitors routinely provided direct observation of field work and quality assurance.

### ***Community Sensitization and Mobilization***

In coordination with the MOH, Ministry of Community Development and Social Work, CSO, National AIDS Council, Network of Zambian People Living with HIV, and Treatment Advocacy and Literacy Campaign, community mobilization was organized to maximize community support and participation rates at the national and subnational levels. The mobilization began with a high-level national launch meeting that included key national and regional leaders, mass media, and other stakeholders before the survey field work commenced. Community mobilization teams visited each enumeration area approximately two to three weeks prior to initiation of data collection and partnered with community health workers to meet key gatekeepers in the communities (chiefs, village headmen, local government officials, and religious and community leaders). Community mobilizers consulted with community leaders and provided them with information about the survey to share with their community members. Mobilizers also held community meetings, disseminated written informational materials such as brochures and posters, and held discussions with selected households and other community residents.

### *Questionnaire Data Collection*

Questionnaire and field laboratory data were collected on mobile tablet devices using an application programmed in Open Data Kit. The household interview collected information on household residents, assets, economic support, recent deaths, and orphans and vulnerable children. The adult interview was administered to participants ages 15-59 and included modules on demographic characteristics, sexual and reproductive health, marriage, male circumcision, sexual activity, HIV/AIDS knowledge and attitudes, the HIV continuum of care, tuberculosis and other health conditions, alcohol use, and gender norms. Participants who self-reported being HIV positive were asked questions about their HIV care experience. Parents also answered questions about their children's (ages 0-14) health and participation in HIV testing and care services. In each household, one woman between the age of 15 and 59 was also randomly selected to answer questions about her experiences with violence. Female participants were interviewed by female staff, and male participants by male staff, whenever possible. The English and translated versions of the questionnaires were reviewed and tested thoroughly for acceptability, feasibility, and flow of questions.

Adolescents ages 10-14 participated in an interview that included questions on demographic characteristics, HIV stigma, knowledge and risk perception, exposure to HIV prevention interventions, sexual behavior, social norms, HIV testing, alcohol and drugs, parental support, and violence.

### *Supervision*

Data-collection teams were regularly supervised by teams of national supervisors/monitors from the MOH, CSO, CDC, ICAP, TDRC, and UNZA. All institutions provided national supervisors/monitors, who rotated throughout the duration of the survey to perform intensive team monitoring, supervision, and laboratory and information technology support based on team metrics and performance. ICAP and CDC international staff conducted monitoring visits routinely to ensure protocol adherence throughout the duration of the survey.

Regional statisticians from the CSO, who were permanently based in their respective provinces and were trained supervisors, assisted with hands-on troubleshooting, replenishment of forms and supplies, and community mobilization and community entry procedures.

These supervision/monitoring teams visited the field teams across the country to deliver survey supplies, perform quality checks on data completeness, provide technology support, assess mobilization efforts, and help address challenges to data collection. Supervision reports were circulated to principal investigator institutions.

## **2.4 Field-Based Biomarker Testing**

### *Blood Collection*

Blood was collected by qualified survey staff from consenting participants: 14 mL of venous blood from persons ages 15-59 and 5 mL from persons ages 2-14; and 1 mL of capillary blood from children ages 0-2 via finger-stick for children ages 6-24 months and heel-stick for children under 6 months of age.



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 and frozen within 24 hours of blood collection and stored in Sarstedt 2.0 mL polypropylene tubes.

### *HIV Home-Based Testing and Counselling*

HIV HBTC was conducted in each household in accordance with national guidelines (Figure 2.4.A). HIV-seropositive participants were referred to HIV care and treatment services at a health facility of their choice. For children under the age of disclosure (children under 18 years old), results were provided to a parent or guardian.

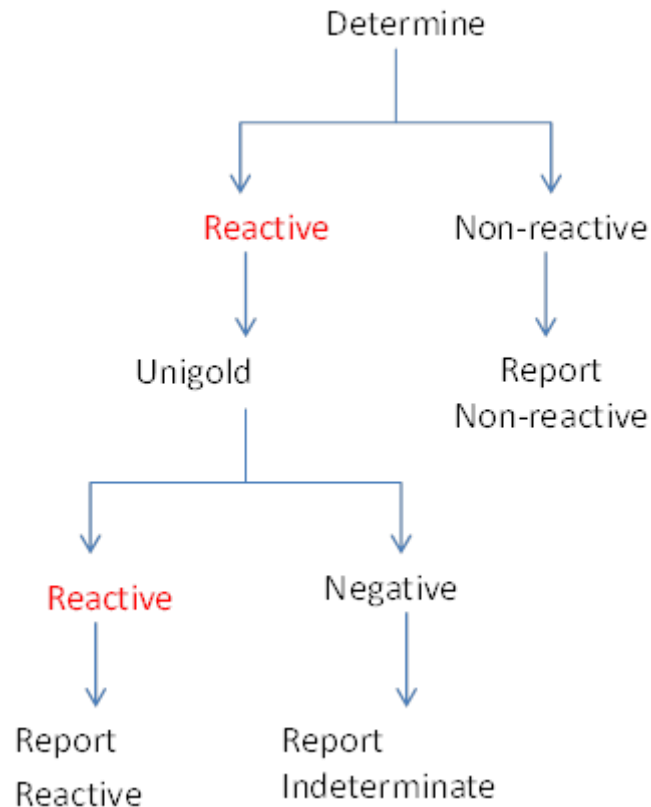
As per Figure 2.4.A, individuals with a nonreactive result on the screening test (Determine) were reported as HIV-negative. Individuals with a reactive screening test result underwent confirmatory testing using Uni-Gold. Those with a reactive result on both screening and confirmatory tests were classified as HIV positive. Individuals with a reactive screening test result followed by a nonreactive confirmatory test result were classified as indeterminate and counseled to attend a facility for a repeat test in 4 weeks, per national guidelines. For children less than 18 months of age, only the screening test (Determine) was performed in the household. If the test was reactive, HIV deoxyribonucleic acid (DNA) polymerase chain reaction testing (PCR), (HIV DNA PCR) for virologic testing of HIV infection was performed in the central laboratory as described below. The ability of rapid tests to detect HIV antibodies among people in the serological window of infection, HIV antibodies in HIV infected patients on ART, and maternal HIV antibodies among infants aged > 4 months born to HIV positive women, is an inherent limitation of the study. Participants in the first two categories are not expected to be a significant source of bias; further analysis will identify how many infants born to positive women were not identified by a rapid test.

All children ages 0-5 who tested HIV positive during HBTC were assessed for undernutrition using anthropometric measurements; 5% of HIV-negative children were also included for lab quality control testing.

### *CD4 T-Cell Count Measurement*

Participants who tested HIV positive during HBTC received a CD4 T-cell count measurement in the field by qualified survey staff using the Pima Analyzer and CD4 test (Alere). In addition, a random sample of 5% of HIV-negative participants also received CD4 T-cell count measurement.

**Figure 2.4.A Household-based HIV-testing algorithm**



### ***Hepatitis B Testing***

Testing for hepatitis B virus infection was conducted in each household for participants of all ages using a serological hepatitis B surface antigen rapid diagnostic test, Determine HBsAg (Alere), which is indicative of chronic active hepatitis B infection.

### ***Syphilis Testing***

Testing for syphilis infection was conducted in each household among participants ages 15-59 using the DPP Syphilis Screen and Confirm Assay (Chembio) for the simultaneous detection of antibodies against non-Treponemal and *Treponema pallidum* antigens, with confirmatory testing using the SD BIOLINE Syphilis 3.0 (Standard Diagnostics, Inc.). SD BIOLINE was used for confirmatory testing as it is approved by the Zambian Government.

## 2.5 Laboratory-Based Biomarker Testing

### *Satellite and Central Laboratories*

A total of 22 satellite laboratories for the survey were established in a combination of existing health facility laboratories and mobile laboratories. One central referral laboratory was chosen for more specialized tests. At each satellite laboratory, trained technicians performed processing of whole blood into plasma aliquots and dried blood spot samples for storage at -20°C, HIV confirmatory testing, and quality assurance testing. Confirmatory testing using the Geenius HIV 1/2 Supplemental Assay (Bio-Rad) was conducted on all samples that tested HIV-positive during HBTC. For quality assurance of the HIV rapid testing conducted in the field, the first 50 samples tested by each field tester, and subsequently all indeterminate samples, along with a random sample of 5% of specimens that tested HIV negative during HBTC, were retested in the laboratory using the national HIV rapid-testing algorithm. Central laboratory procedures included viral load testing, HIV DNA PCR for infant virologic testing and for confirmation of status of those who self-reported HIV positive but tested negative in HBTC, HIV recency testing, and long-term storage of samples at -80°C.

### *Testing of HBTC-Indeterminate Results*

Samples that yielded indeterminate results during HBTC were retested in the laboratory using the national HIV rapid-testing algorithm. Those with positive or indeterminate retesting results underwent confirmation with the Geenius HIV 1/2 Supplemental Assay (Bio-Rad).

### *Viral Load Testing*

HIV-1 viral load (HIV RNA copies per milliliter) of confirmed HIV-positive participants was measured using the COBAS TaqMan 48 Analyzer and the COBAS AmpliPrep/COBAS TaqMan HIV-1 Test, v2.0 (Roche Molecular Diagnostics). The COBAS AmpliPrep/COBAS TaqMan HIV-1 Test v2.0 (Roche Molecular Diagnostics) was used to measure viral load from dried blood spot specimens from children and adults with insufficient volume of plasma.

Viral load results were returned within approximately 6-8 weeks to the health facility chosen by each HIV-positive participant. Additionally, participants were provided with a referral form during HBTC for subsequent retrieval of their results. Survey staff also contacted each participant informing them that their viral load results were available at the chosen facility and further advising them to seek care and treatment.

### *Infant Virologic Testing*

For infants under 18 months of age who screened positive for HIV during HBTC, virologic testing was conducted via HIV DNA polymerase chain reaction, using the COBAS AmpliPrep/COBAS Taqman HIV-1 Qualitative Test, version 2.0. Results were returned to a health facility selected by the child's parent or guardian within approximately 6-8 weeks, and survey staff also contacted the parent or guardian to inform them that the child's results were available at the facility.

### *HIV Recency Testing*

A laboratory-based HIV recent-infection testing algorithm, which employed a combination of the HIV-1 Limiting Antigen (LAG)-Avidity enzyme immunoassay (Sedia Biosciences Corporation) and viral load, was used to distinguish recent (those infected roughly less than 6 months previously) from long-term

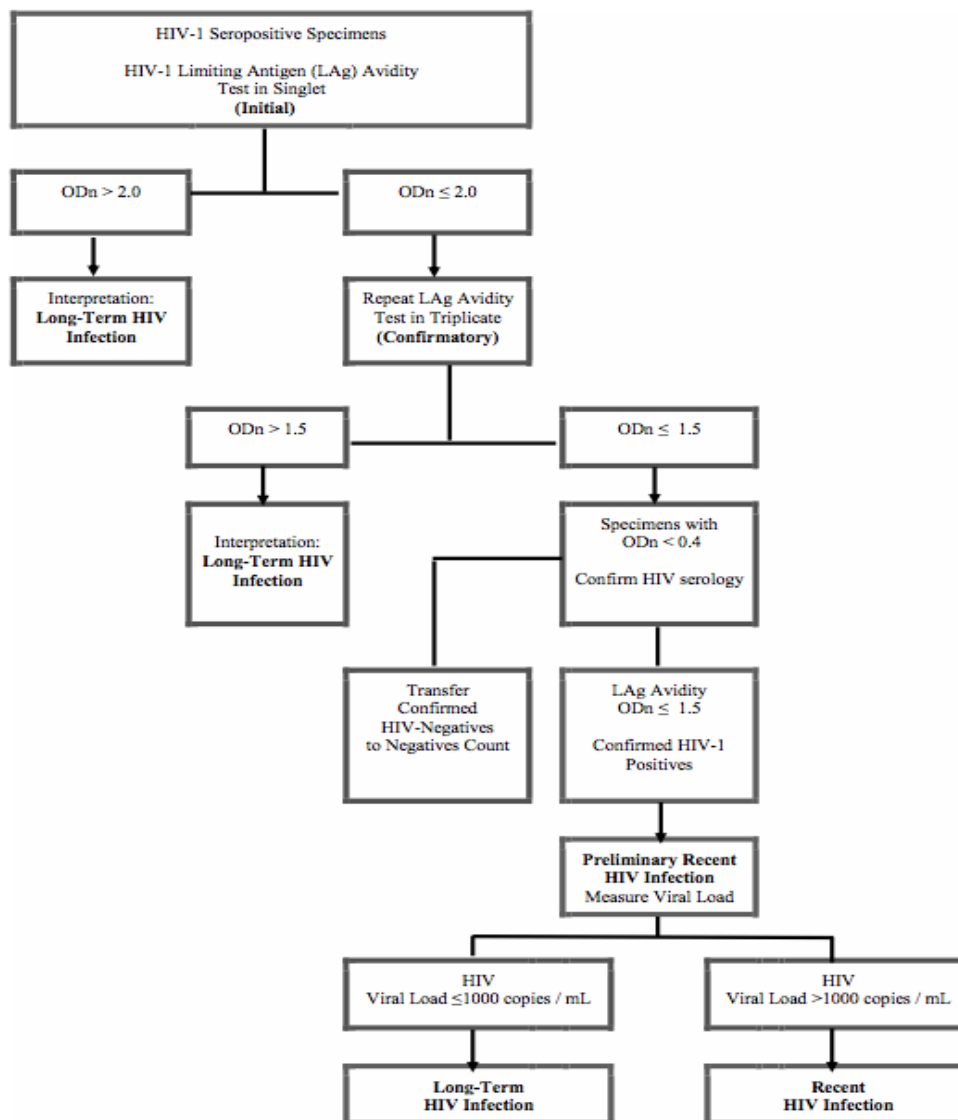
infection (those infected more than 6 months ago) in order to estimate incidence (Figure 2.5.A). The HIV recent-infection testing algorithm was applied to repository specimens from all confirmed HIV-positive participants 18 months and older.

LAG testing was performed twice, with an initial screening test followed by a confirmatory process: specimens with a normalized optical density (ODn)  $> 2.0$  during initial testing were classified as long-term infections, while those with  $\text{ODn} \leq 2.0$  underwent further testing of the specimen in triplicate. Specimens with median ODn  $> 1.5$  in confirmatory testing were classified as long-term infections. Specimens with median ODn  $< 0.4$  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-positive specimens and incorporated into the total number of negative specimens for incidence estimation.

Specimen with a median ODn of  $\leq 1.5$  were classified as potential HIV-recent samples and underwent viral load testing for further classification. Specimen with a viral load of  $< 1,000$  copies/mL were classified as long-term infections, while those with a viral load of  $\geq 1,000$  copies/mL were classified as recent infections.

The ZAMPHIA protocol for all procedures described was reviewed and approved by the TDRC Ethical Review Committee, the Institutional Review Board at Columbia University, and the CDC.

**Figure 2.5.A HIV recent-infection testing algorithm**



## 2.6 Data Processing and Analysis

Completed household and individual questionnaires and field laboratory data were submitted electronically to a cloud server and stored in a secure PostgreSQL database. Data were automatically removed from the tablet after secure transmission to the central server. A web-based automated reporting tool drew raw data from the survey server weekly to generate predefined reports, which summarized key statistics for survey monitoring and management, with reports generated for the survey team, the government of the Republic of Zambia through the MOH, ICAP at Columbia, University Teaching Hospital, CDC, CSO, TDRC, and UNZA.



Data cleaning was conducted using SAS 9.4. Laboratory data were cleaned and merged with the final questionnaire database using unique specimen barcodes and study identification numbers. Sampling weights were computed to adjust for probability of selection, nonresponse, and noncoverage. All results presented in the report are based on weighted estimates unless otherwise noted.

Descriptive analyses of response rates, 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-positive cases identified as recent infections with the HIV-1 LAg Avidity plus viral load algorithm, and obtained using the CDC Incidence Calculator, which uses the formula recommended by the World Health Organization Technical Working Group on HIV Incidence Assays and the Consortium for the Evaluation and Performance of HIV Incidence Assays, with time cutoff (T) = 1.0 year and residual proportion false recent = 0.00.

# RESULTS

## 3.1 Response Rates

Of the 13,441 households selected for this survey, 12,193 were occupied, and 89.4% of these completed a household interview. The urban and rural weighted household response rates were almost exactly the same at 89.5% and 89.2%, respectively (Table 3.1.A).

Of the 13,317 eligible women and 11,346 eligible men ages 15-59, 90.8% of women and 80.4% of men were interviewed. The response rate for biomarker testing among those who completed an individual interview was 88.5% for males and 90.3% for females. Of the 3,593 eligible children ages 10-14, 74.9% of males and 79.1% of females completed an interview, while similar percentages of males (90.9%) and females (90.6%) completed biomarker testing. Of 8,053 eligible children ages 0-9, about two-thirds (66.9% for males and 66.7% for females) had their blood drawn (Table 3.1.B).

**Table 3.1.A Results of the household interviews**

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

Result	Residence		Total
	Urban	Rural	
<b>Household interviews</b>			
Households selected	5,347	8,094	13,441
Households occupied	4,989	7,204	12,193
Households interviewed	4,494	6,463	10,957
Household response rate <sup>1</sup> (unweighted)	89.6	88.8	89.1
Household response rate <sup>1</sup> (weighted)	89.5	89.2	89.4

<sup>1</sup>Household response rate was calculated using the American Association for Public Opinion

Research Response Rate 4 method:

[https://www.aapor.org/AAPOR\\_Main/media/publications/Standard-Definitions2015\\_8theditionwithchanges\\_April2015\\_logo.pdf](https://www.aapor.org/AAPOR_Main/media/publications/Standard-Definitions2015_8theditionwithchanges_April2015_logo.pdf).

**Table 3.1.B Results of the individual interviews and blood draws**

Number of eligible individuals and response rates for individual interviews and blood draws (unweighted and weighted), by residence and sex, ZAMPHIA 2016

Result	Residence					
	Urban		Rural		Total	
	Males	Females	Males	Females	Males	Females
<b>Eligible individuals, ages 0-9</b>						
Number of eligible individuals	1,399	1,456	2,637	2,561	4,036	4,017
Blood draw response rate (unweighted)	68.0	68.4	67.8	67.7	67.8	68.0
Blood draw response rate (weighted)	67.6	68.6	66.5	65.6	66.9	66.7
<b>Eligible individuals, ages 10-14</b>						
Number of eligible individuals	659	700	1,170	1,064	1,829	1,764
Interview response rate (unweighted)	78.3	79.0	73.9	80.4	75.5	79.8
Interview response rate (weighted)	78.3	78.8	72.5	79.2	74.6	79.1
Blood draw response rate (unweighted)	91.9	92.2	91.2	90.4	91.5	91.1
Blood draw response rate (weighted)	92.0	92.0	90.2	89.7	90.9	90.6
<b>Eligible individuals, ages 15-24</b>						
Number of eligible individuals	1,885	2,470	2,452	2,735	4,337	5,205
Interview response rate (unweighted)	79.6	88.7	81.6	87.6	80.7	88.1
Interview response rate (weighted)	79.4	88.3	81.4	87.9	80.5	88.1
Blood draw response rate (unweighted)	90.4	91.9	89.9	89.8	90.1	90.8
Blood draw response rate (weighted)	90.5	92.0	89.6	89.4	90.0	90.6
<b>Eligible individuals, ages 15-49</b>						
Number of eligible individuals	4,705	5,660	5,653	6,532	10,358	12,192
Interview response rate (unweighted)	73.9	89.6	85.4	91.6	80.2	90.6
Interview response rate (weighted)	73.2	89.3	85.3	91.6	79.8	90.5
Blood draw response rate (unweighted)	87.6	91.4	89.3	89.9	88.6	90.6
Blood draw response rate (weighted)	87.5	91.4	89.0	89.4	88.3	90.3
<b>Eligible individuals, ages 15-59</b>						
Number of eligible individuals	5,093	6,125	6,253	7,192	11,346	13,317
Interview response rate (unweighted)	74.3	89.7	86.1	92.0	80.8	90.9
Interview response rate (weighted)	73.6	89.4	86.0	92.0	80.4	90.8
Blood draw response rate (unweighted)	87.6	91.5	89.6	89.9	88.8	90.6
Blood draw response rate (weighted)	87.5	91.5	89.4	89.4	88.5	90.3

Figures in parentheses are based on 25-49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

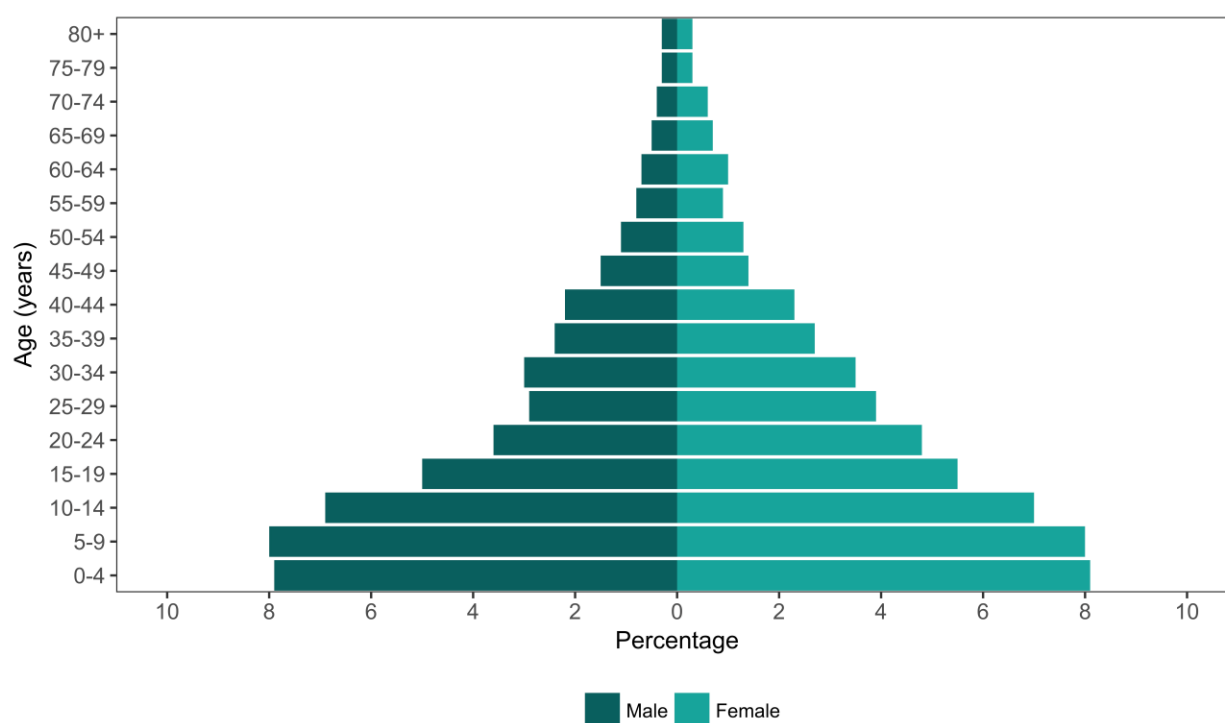
## 3.2 Characteristics of Households and Respondents

### Households

Overall, three-fourths of all households (74.5%) were headed by males. This was the case in both rural and urban areas (74.2% and 75.1%, respectively). Households had a median size of five members, and the median number of children under 18 years of age in a household was two (Table 3.2.A).

Overall, 56.3% of the de facto population was under the age of 19, which indicates that Zambia's population is young. Women of child-bearing age (15-49 years) comprise 24% of the population. Those age 50 years and older comprised 9.4% of the population (Figure 3.2.A; Table 3.2.B).

**Figure 3.2.A Distribution of the de facto population by sex and age, ZAMPHIA 2016**



### Respondents

A total of 21,280 persons ages 15-59 participated in the survey's individual interviews (9,171 males and 12,109 females). Slightly more than half of the total respondent population lived in rural areas of the country (54.3%) at the time of the survey. The largest participant population was located in Lusaka (20.1%) and the smallest in North-Western Province (5.2%). The distribution of adult respondents ranged from 3.4% in the 55-59 age group to 22.0% in the 15-19 age group. Secondary education was the highest level of schooling attended for 44.4% of adult respondents. Nearly half (49.4%) of the male population reported secondary education as their highest level of schooling attended, compared to 39.6% of the female population. The proportion of females with no education (7.1%) was double that of males (3.3%). Slightly more than half of the population (53.6%) reported being married or living with a partner, with more than a third of the

population (37.2%) reporting being single. In terms of religion, Protestants constitute the largest religious group (68.9%), followed by Catholics, with close to a fifth (19.4%) of the population associated with this denomination.

Over 60% of respondents ages 10-14 reside in rural areas (63.1% of males, 61.1% females). Both the Copperbelt (15.0%) and Lusaka (14.9%) Provinces have the largest share of the adolescent population, followed by the Eastern (13.1%) and Southern (11.7%) Provinces. The vast majority (95.5%) of the adolescent population was currently attending school (Table 3.2.D).

**Table 3.2.A Household composition**

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

Characteristic	Residence					
	Urban		Rural		Total	
	Percent	Number	Percent	Number	Percent	Number
<b>Household headship</b>						
Male	75.1	3,361	74.2	4,798	74.5	8,159
Female	24.9	1,133	25.8	1,665	25.5	2,798
<b>Total</b>	100.0	4,494	100.0	6,463	100.0	10,957

Characteristic	Residence					
	Urban		Rural		Total	
	Median	Q1, Q3	Median	Q1, Q3	Median	Q1, Q3
Size of households	5	(3, 6)	5	(3, 7)	5	(3, 6)
Number of children under 18 years of age	2	(1, 3)	3	(1, 4)	2	(1, 4)



**Table 3.2.B Age and sex distribution of the de facto household population**

Percent distribution of the de facto household population, by five-year age group and sex, ZAMPHIA 2016

Age	Males		Females		Total	
	Percent	Number	Percent	Number	Percent	Number
0–4	7.9	4,015	8.1	4,100	16.0	8,115
5–9	8.0	4,093	8.0	4,045	16.0	8,138
10–14	6.9	3,566	7.0	3,556	13.9	7,122
15–19	5.0	2,543	5.5	2,799	10.4	5,342
20–24	3.6	1,847	4.8	2,447	8.5	4,294
25–29	2.9	1,494	3.9	1,969	6.8	3,463
30–34	3.0	1,497	3.5	1,749	6.5	3,246
35–39	2.4	1,232	2.7	1,388	5.2	2,620
40–44	2.2	1,099	2.3	1,162	4.4	2,261
45–49	1.5	768	1.4	745	3.0	1,513
50–54	1.1	575	1.3	677	2.4	1,252
55–59	0.8	420	0.9	455	1.7	875
60–64	0.7	356	1.0	479	1.7	835
65–69	0.5	277	0.7	360	1.3	637
70–74	0.4	210	0.6	278	1.0	488
75–79	0.3	145	0.3	164	0.6	309
≥80	0.3	169	0.3	180	0.7	349
<b>Total</b>	47.7	24,306	52.3	26,553	100.0	50,859

<b>Table 3.2.C Demographic characteristics of the respondent population</b>						
Percent distribution of the population ages 15-59, by sex and selected demographic characteristics, ZAMPHIA 2016						
Characteristic	Males		Females		Total	
	Percent	Number	Percent	Number	Percent	Number
<b>Residence</b>						
Urban	45.3	3,785	46.1	5,494	45.7	9,279
Rural	54.7	5,386	53.9	6,615	54.3	12,001
<b>Province</b>						
Central	9.6	789	9.5	1,001	9.5	1,790
Copperbelt	16.7	1,565	16.4	2,063	16.6	3,628
Eastern	10.8	881	11.2	1,147	11.0	2,028
Luapula	6.4	476	6.9	663	6.6	1,139
Lusaka	20.2	1,440	20.0	2,207	20.1	3,647
Muchinga	5.7	846	5.6	1,073	5.6	1,919
Northern	8.5	771	8.5	959	8.5	1,730
North-Western	5.2	867	5.2	1,115	5.2	1,982
Southern	11.8	1,085	11.1	1,288	11.4	2,373
Western	5.2	451	5.7	593	5.4	1,044
<b>Marital status</b>						
Never married	44.7	3,779	30.0	3,293	37.2	7,072
Married or living together	50.7	4,874	56.4	7,010	53.6	11,884
Divorced or separated	4.0	378	9.1	1,132	6.6	1,510
Widowed	0.6	64	4.5	585	2.6	649
<b>Education</b>						
No education	3.3	287	7.1	842	5.2	1,129
Primary	37.0	3,525	46.3	5,689	41.7	9,214
Secondary	49.4	4,462	39.6	4,755	44.4	9,217
More than secondary	10.4	887	7.0	813	8.7	1,700
<b>Religion</b>						
Catholic	20.4	1,812	18.4	2,187	19.4	3,999
Protestant	69.7	6,435	68.2	8,313	68.9	14,748
Muslim	0.6	50	(0.4)	44	0.5	94
Other	7.3	676	12.5	1,494	9.9	2,170
None	2.0	186	0.5	58	1.3	244

<b>Age</b>						
15–19	22.3	2,006	21.7	2,331	22.0	4,337
20–24	19.1	1,496	19.0	2,256	19.1	3,752
25–29	14.0	1,209	15.4	1,804	14.7	3,013
30–34	11.9	1,157	13.2	1,614	12.5	2,771
35–39	10.2	956	9.9	1,299	10.0	2,255
40–44	8.5	851	7.7	1,071	8.1	1,922
45–49	6.1	630	5.4	677	5.7	1,307
50–54	4.5	491	4.3	630	4.4	1,121
55–59	3.3	375	3.5	427	3.4	802
Total 15–49	92.2	8,305	92.2	11,052	92.2	19,357
<b>Total 15–59</b>	100.0	9,171	100.0	12,109	100.0	21,280

Education categories refer to the highest level of education attended, whether or not that level was completed.  
Figures in parentheses are based on 25–49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

**Table 3.2.D Demographic characteristics of the adolescent respondent population**

Percent distribution of the population ages 10-14, by sex and selected demographic characteristics, ZAMPHIA 2016

Characteristic	Males		Females		Total	
	Percent	Number	Percent	Number	Percent	Number
<b>Residence</b>						
Urban	36.9	516	38.9	553	37.9	1,069
Rural	63.1	865	61.1	855	62.1	1,720
<b>Province</b>						
Central	9.7	117	10.4	140	10.0	257
Copperbelt	14.3	208	15.6	233	15.0	441
Eastern	14.2	162	11.9	131	13.1	293
Luapula	7.2	76	7.9	87	7.6	163
Lusaka	14.3	184	15.5	196	14.9	380
Muchinga	7.1	153	6.3	134	6.7	287
Northern	10.5	116	9.1	112	9.8	228
North-Western	5.6	136	5.8	147	5.7	283
Southern	12.0	167	11.4	157	11.7	324
Western	5.0	62	5.9	71	5.5	133
<b>Education</b>						
Currently attending school	95.4	1,274	95.5	1,313	95.5	2,587
Not currently attending school	4.6	55	4.5	61	4.5	116
<b>Total 10-14</b>	100.0	1,381	100.0	1,408	100.0	2,789

### 3.3 HIV Incidence, HIV Prevalence, and Immunosuppression

#### Key Findings

**Annual incidence** of HIV among adults ages 15-59 in Zambia is 0.67%: 1.02% among females and 0.32% among males. This corresponds to approximately 47,000 new cases of HIV annually among adults ages 15-59 in Zambia.

**Prevalence of HIV** among adults ages 15-59 in Zambia is 12.0%: 14.6% among females and 9.3% among males. This corresponds to approximately 960,000 people living with HIV ages 15-59 in Zambia.

**Median CD4** count among HIV-positive participants ages 15-59 was 421 cells/ $\mu$ L, and nearly two-thirds of participants (64.3%) were immunosuppressed (<500 CD4 cells/ $\mu$ L).

#### *HIV Incidence*

The survey was designed to estimate national-level HIV incidence for the overall population ages 15-59. Consequently, point estimates disaggregated by age and sex should be interpreted with caution, and special attention should be given to CIs presented in Table 3.3.A. Annual HIV incidence among persons ages 15-59 in Zambia was 0.67% (0.32% among males and 1.02% among females). This corresponds to 67 new infections per 10,000 persons in a year, which corresponds to approximately 47,000 new cases of HIV infection per year in Zambia (Table 3.3.A).

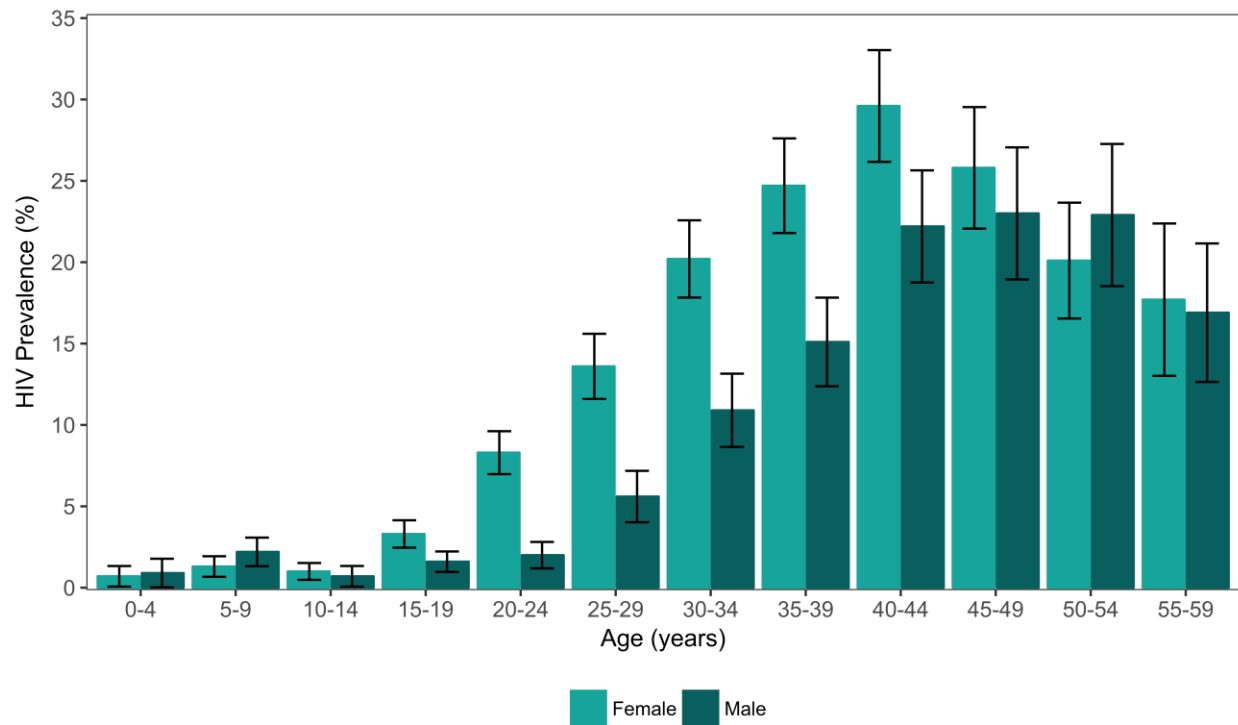
#### *HIV Prevalence*

The prevalence of HIV among adults ages 15-59 in Zambia was 12.0%. This corresponds to an estimated 960,000 persons ages 15-59 living with HIV in Zambia. As in the 15- to 49-year-old population, the prevalence was higher among females (14.6%) than among males (9.3%), as well as among those residing in urban areas (15.3%) compared to those living in rural areas (9.2%). In both urban and rural areas, the prevalence is higher among females than among males. However, the difference in prevalence between females and males is more pronounced in urban areas. In the Eastern and Muchinga Provinces, the prevalence of HIV among females (10.7% and 7.9%, respectively) was twice as high as compared to the prevalence in males (5.2% and 3.4%, respectively). Almost half of all widowed participants (48.5%) were HIV positive (Table 3.3.C).

HIV prevalence peaked between ages 40-44 for females (29.6%) and between ages 45-49 for males (23.0%). HIV prevalence is statistically significantly higher among females than among males in all age groups between 15-44 years. However, the disparity in HIV prevalence by sex is most pronounced among young adults: HIV prevalence among 20- to 24-year-olds is four times higher among females (8.3%) than among males (2.0%); and among 25- to 29-year-olds, prevalence among women is more than twice that of men (13.6% for females versus 5.6% for males). HIV prevalence among children aged 0-14 is estimated to be 1.1% (Table 3.3.D, Figure 3.3.A).

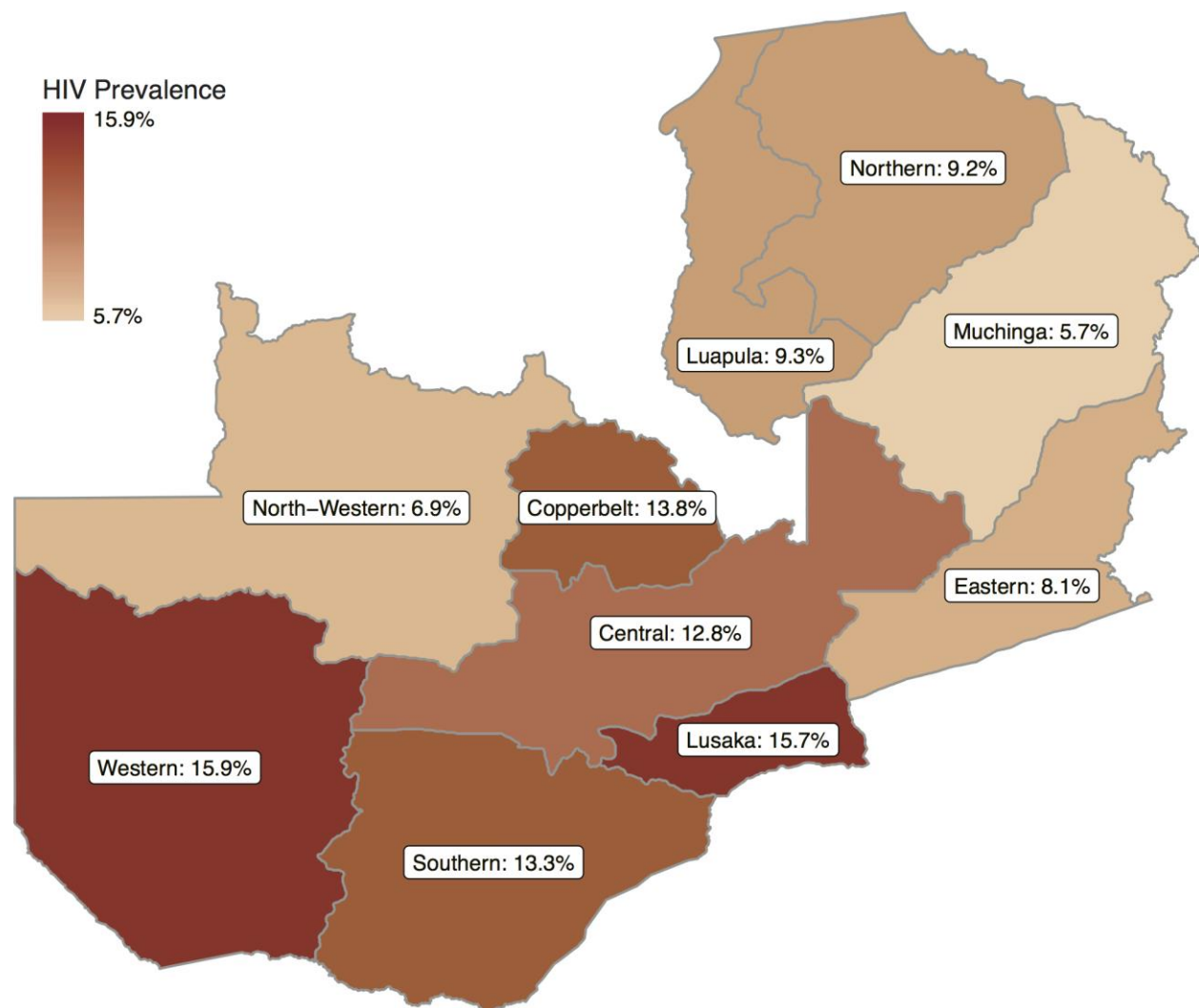


**Figure 3.3.A HIV prevalence among persons ages 0-59, by sex and age**

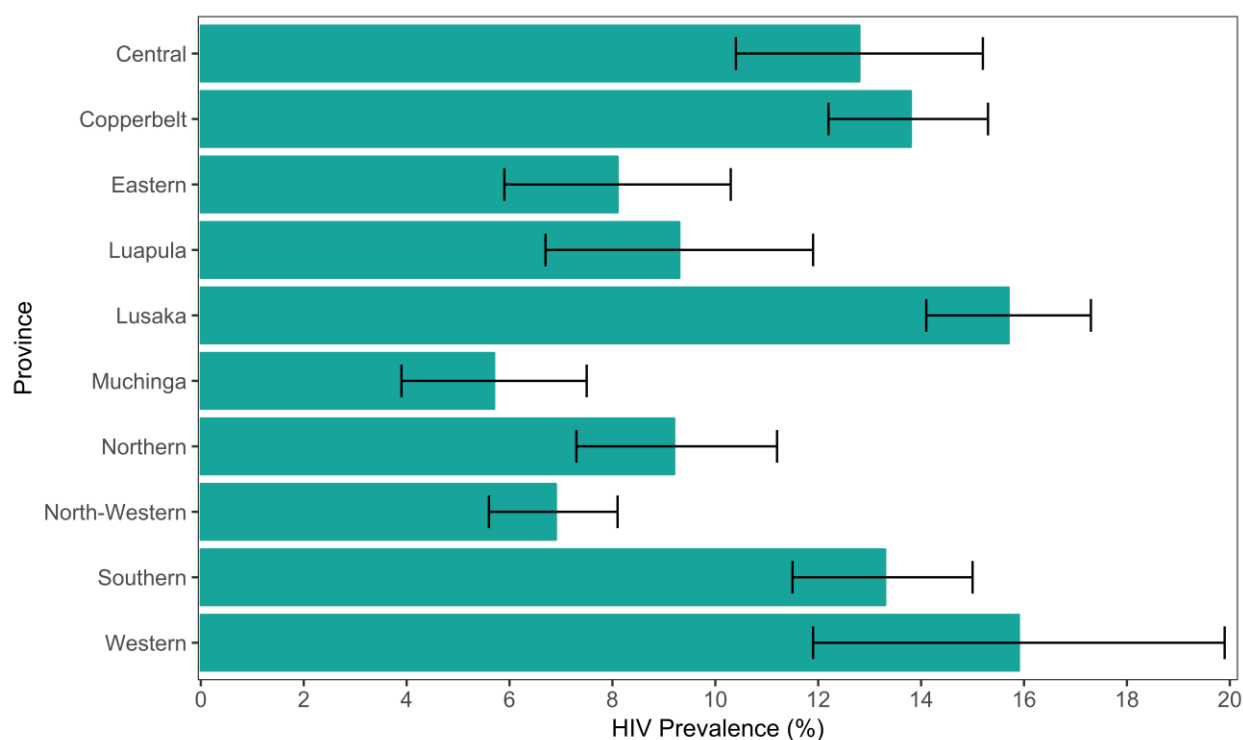


The distribution of HIV infections in the population ages 15-59 varied geographically across Zambia, with the lowest prevalence found in Muchinga Province at 5.7%, and the highest prevalence found in Western Province at 15.9%, followed very closely by Lusaka Province, at 15.7% (Figures 3.3.B and 3.3.C).

**Figure 3.3.B HIV prevalence among adults ages 15-59, by province**



**Figure 3.3.C HIV prevalence among adults ages 15-59, by province**

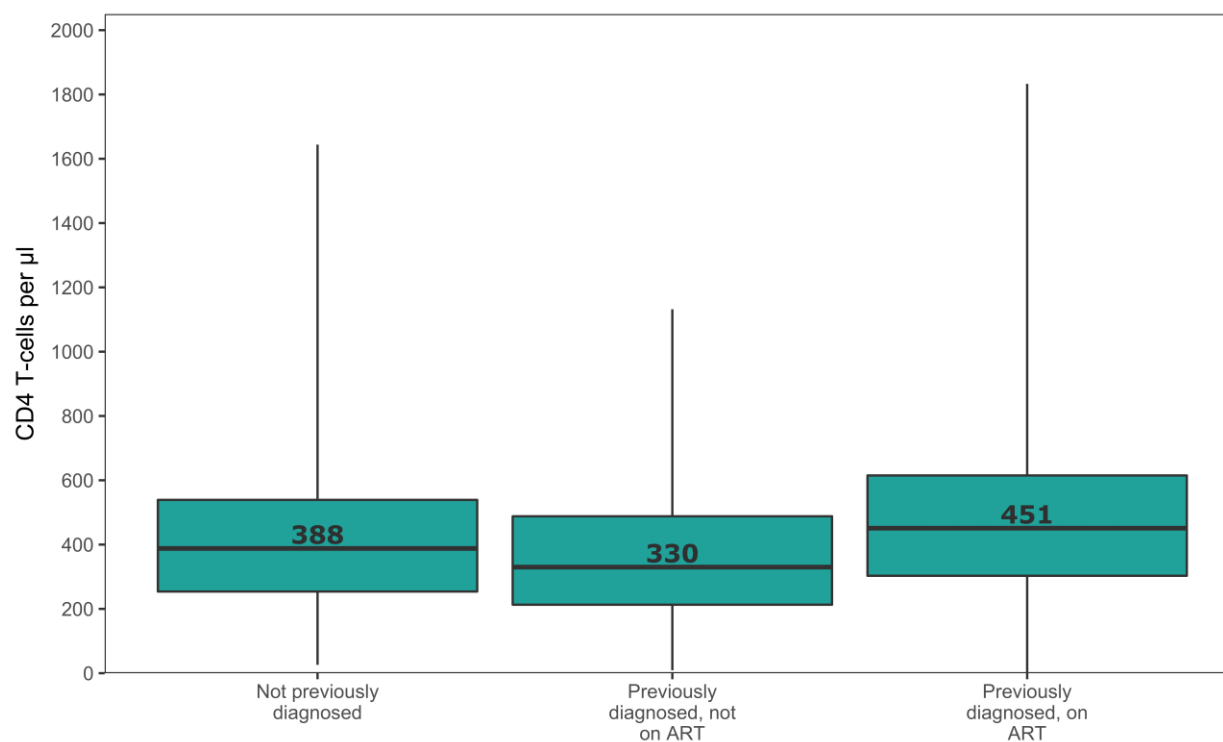


### *CD4 T-Cell Counts and Immunosuppression*

The median CD4 count among all HIV-positive participants ages 15-59 was 421 cells/ $\mu$ L. Nearly two-thirds (64.3%) of those within this age group were immunosuppressed (defined as CD4 < 500 cells/ $\mu$ L). Prevalence of immunosuppression was lower in HIV-positive females (58.9%) than in males (73.2%) ages 15-59. Among those HIV-positive participants who reported not being aware of their status (that is, not being previously diagnosed with HIV), the median CD4 count was 388 cells/ $\mu$ L. The median CD4 count was 451 cells/ $\mu$ L among those who reported being previously diagnosed and on ART, compared to 330 cells/ $\mu$ L among those who reported that they had been previously diagnosed but were not on ART. Among those on ART, the median CD4 count was 396 cells/ $\mu$ L among men and 487 cells/ $\mu$ L among women (Table 3.3.E; Figure 3.3.D).

The proportion of immunosuppression among HIV-positive persons who reported having been previously diagnosed and on ART was 59.2%, compared to 76.0% among those who reported having been previously diagnosed but not on ART and 69.8% among those reporting not being previously diagnosed. Among those ages 15-59 who were previously diagnosed and on ART, approximately half (53.0%) of the females were immunosuppressed compared to 70.1% of the males. By age, the proportion of immunosuppression ranged from 53.2% among 15- to 19-year-olds to 73.2% among 55- to 59-year-olds. Geographically, the median CD4 count in HIV-positive persons ranged from 369 cells/ $\mu$ L for those residing in North-Western Province to 457 cells/ $\mu$ L among those residing in Luapula (Table 3.3.E).

**Figure 3.3.D CD4 T-cell count distribution among HIV-positive adults ages 15-59, by ART status**



**Table 3.3.A Annual HIV incidence**

Annual incidence of HIV among persons ages 15-59, by sex and age, ZAMPHIA 2016

Age	Males		Females		Total	
	Percentage annual incidence	95% CI	Percentage annual incidence	95% CI	Percentage annual incidence	95% CI
15-24	0.08	(0.00, 0.25)	1.07	(0.52, 1.62)	0.57	(0.27, 0.87)
25-34	0.25	(0.00, 0.63)	1.16	(0.46, 1.86)	0.72	(0.30, 1.13)
35-49	0.87	(0.13, 1.60)	1.06	(0.30, 1.82)	0.96	(0.43, 1.49)
15-49	0.31	(0.09, 0.54)	1.10	(0.71, 1.48)	0.70	(0.47, 0.93)
15-59	0.32	(0.10, 0.54)	1.02	(0.66, 1.37)	0.67	(0.45, 0.88)

**Table 3.3.B HIV prevalence by demographic characteristics: Ages 15-49**

Prevalence of HIV among persons ages 15-49, by sex and selected demographic characteristics, ZAMPHIA 2016

Characteristic	Males		Females		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
<b>Residence</b>						
Urban	10.4	3,047	18.2	4,636	14.4	7,683
Rural	6.6	4,311	10.8	5,374	8.7	9,685
<b>Province</b>						
Central	8.5	630	16.2	812	12.4	1,442
Copperbelt	8.9	1,245	17.3	1,715	13.2	2,960
Eastern	4.5	736	10.1	965	7.4	1,701
Luapula	6.8	386	10.9	521	8.9	907
Lusaka	10.7	1,134	17.9	1,869	14.4	3,003
Muchinga	2.8	686	7.8	892	5.3	1,578
Northern	7.7	593	10.9	745	9.4	1,338
North-Western	4.6	679	8.2	935	6.4	1,614
Southern	10.7	911	14.4	1,071	12.5	1,982
Western	12.2	358	18.1	485	15.4	843
<b>Marital status</b>						
Never married	2.7	3,345	7.3	2,959	4.6	6,304
Married or living together	12.6	3,620	13.6	5,742	13.2	9,362
Divorced or separated	22.9	293	29.5	895	27.6	1,188
Widowed	(39.0)	40	57.4	336	54.9	376
<b>Education</b>						
No education	6.7	220	11.7	606	10.0	826
Primary	7.7	2,742	14.0	4,546	11.2	7,288
Secondary	8.7	3,737	14.8	4,181	11.5	7,918
More than secondary	9.0	651	15.5	674	11.7	1,325

**Religion**

Catholic	7.8	1,456	14.1	1,751	10.8	3,207
Protestant	8.1	5,153	14.2	6,938	11.2	12,091
Muslim	(12.5)	38	(14.9)	34	13.5	72
Other	9.4	565	14.5	1,232	12.6	1,797
None	15.1	139	(21.4)	47	16.4	186

**Pregnancy status**

Currently pregnant			9.2	789		
Not currently pregnant			14.8	9,067		

<b>Total 15–49</b>	8.3	7,358	14.3	10,010	11.4	17,368
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Figures in parentheses are based on 25–49 unweighted cases.

**Table 3.3.C HIV prevalence by demographic characteristics: Ages 15-59**

Prevalence of HIV among persons ages 15-59, by sex and selected demographic characteristics, ZAMPHIA 2016

Characteristic	Males		Females		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
<b>Residence</b>						
Urban	11.6	3,315	18.7	5,025	15.3	8,340
Rural	7.4	4,827	11.1	5,948	9.2	10,775
<b>Province</b>						
Central	9.1	702	16.5	889	12.8	1,591
Copperbelt	10.0	1,386	17.5	1,898	13.8	3,284
Eastern	5.2	819	10.7	1,070	8.1	1,889
Luapula	7.3	426	11.1	590	9.3	1,016
Lusaka	12.4	1,242	18.8	2,003	15.7	3,245
Muchinga	3.4	758	7.9	971	5.7	1,729
Northern	7.9	659	10.5	820	9.2	1,479
North-Western	4.8	765	8.8	1,012	6.9	1,777
Southern	11.6	990	15.0	1,186	13.3	2,176
Western	13.7	395	17.8	534	15.9	929
<b>Marital status</b>						
Never married	2.8	3,368	7.5	2,987	4.7	6,355
Married or living together	13.4	4,319	13.4	6,333	13.4	10,652
Divorced or separated	23.9	332	29.4	1,038	27.8	1,370
Widowed	46.6	60	48.8	536	48.5	596
<b>Education</b>						
No education	7.3	246	12.4	715	10.8	961
Primary	8.4	3,142	14.3	5,184	11.8	8,326
Secondary	9.6	4,012	15.2	4,354	12.2	8,366
More than secondary	11.3	733	15.7	716	13.1	1,449

**Religion**

Catholic	8.7	1,614	14.9	1,968	11.7	3,582
Protestant	9.1	5,714	14.6	7,565	11.9	13,279
Muslim	(12.1)	40	(16.1)	38	13.7	78
Other	10.1	609	14.5	1,341	12.9	1,950
None	16.6	157	19.2	53	17.2	210

**Pregnancy status**

Currently pregnant			9.2	789		
Not currently pregnant			15.1	10,022		

<b>Total 15–59</b>	9.3	8,142	14.6	10,973	12.0	19,115
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Figures in parentheses are based on 25-49 unweighted cases.



**Table 3.3.D HIV prevalence by age**

Prevalence of HIV among persons ages 0-59, by sex and age, ZAMPHIA 2016

Age	Males		Females		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
0–17 months	1.0	310	0.7	372	0.8	682
18–59 months	0.9	966	0.7	945	0.8	1,911
5–9	2.2	1,462	1.3	1,414	1.8	2,876
10–14	0.7	1,263	1.0	1,283	0.9	2,546
Total 0–4	0.9	1,276	0.7	1,317	0.8	2,593
Total 0–14	1.3	4,001	1.0	4,014	1.1	8,015
15–19	1.6	1,811	3.3	2,120	2.5	3,931
20–24	2.0	1,344	8.3	2,045	5.2	3,389
25–29	5.6	1,053	13.6	1,619	9.8	2,672
30–34	10.9	1,003	20.2	1,458	15.9	2,461
35–39	15.1	836	24.7	1,160	19.9	1,996
40–44	22.2	751	29.6	989	25.8	1,740
45–49	23.0	560	25.8	619	24.4	1,179
50–54	22.9	444	20.1	584	21.5	1,028
55–59	16.9	340	17.7	379	17.3	719
Total 15–24	1.8	3,155	5.7	4,165	3.8	7,320
Total 15–49	8.3	7,358	14.3	10,010	11.4	17,368
<b>Total 15–59</b>	<b>9.3</b>	<b>8,142</b>	<b>14.6</b>	<b>10,973</b>	<b>12.0</b>	<b>19,115</b>

**Table 3.3.E Median CD4 count and prevalence of immunosuppression**

Among HIV-positive persons ages 15-59, median (Q1, Q3) CD4 count and percentage with immunosuppression (<500 cells/ $\mu$ L), by sex, self-reported diagnosis, and ART status, and selected demographic characteristics, ZAMPHIA 2016

Characteristic	Males			Females			Total		
	Median (Q1, Q3)	Percentage < 500 cells/ $\mu$ L	Number	Median (Q1, Q3)	Percentage < 500 cells/ $\mu$ L	Number	Median (Q1, Q3)	Percentage < 500 cells/ $\mu$ L	Number
<b>Self-reported diagnosis and treatment status</b>									
Not previously diagnosed	360 (223, 501)	74.8	274	414 (276, 569)	66.2	499	388 (254, 539)	69.8	773
Previously diagnosed, not on ART	248 (142, 412)	88.1	68	365 (257, 525)	70.2	168	330 (213, 488)	76.0	236
Previously diagnosed, on ART	396 (259, 528)	70.1	409	487 (345, 667)	53.0	990	451 (303, 615)	59.2	1,399
Missing	*	*	15	*	*	23	462 (295, 613)	(57.3)	38
<b>Residence</b>									
Urban	368 (227, 509)	72.7	403	450 (303, 614)	59.8	1,004	423 (277, 574)	64.5	1,407
Rural	364 (240, 511)	73.8	363	449 (302, 645)	57.8	676	418 (273, 581)	64.0	1,039
<b>Province</b>									
Central	326 (246, 450)	83.8	69	432 (274, 616)	60.7	159	377 (267, 545)	68.8	228
Copperbelt	382 (242, 540)	68.3	153	444 (315, 616)	59.4	353	418 (279, 580)	62.6	506
Eastern	445 (247, 554)	(63.4)	45	440 (308, 615)	60.4	129	441 (286, 593)	61.3	174
Luapula	318 (207, 559)	(69.0)	32	475 (332, 716)	56.0	69	457 (277, 631)	60.8	101
Lusaka	381 (228, 511)	71.3	167	465 (318, 628)	57.3	414	435 (279, 578)	62.7	581
Muchinga	308 (189, 453)	(82.4)	27	470 (327, 596)	55.4	80	437 (277, 575)	63.4	107
Northern	427 (206, 536)	66.7	54	376 (280, 611)	60.5	91	399 (263, 583)	63.0	145
North-Western	335 (202, 472)	(82.4)	38	387 (265, 567)	68.4	97	369 (238, 523)	73.1	135
Southern	355 (238, 488)	76.8	123	479 (324, 633)	54.1	186	413 (274, 560)	64.3	309
Western	338 (169, 442)	81.8	58	416 (274, 671)	65.2	102	378 (235, 537)	71.8	160
<b>Marital status</b>									
Never married	425 (285, 576)	65.7	85	438 (298, 616)	60.9	236	431 (293, 612)	62.5	321
Married or living together	362 (227, 508)	73.1	574	471 (324, 642)	55.3	861	427 (277, 573)	63.6	1,435
Divorced or separated	342 (220, 474)	79.2	77	420 (282, 562)	65.6	315	402 (269, 544)	69.0	392
Widowed	259 (170, 467)	(82.5)	28	424 (270, 657)	60.8	262	413 (253, 635)	63.4	290

**Education**

No education	*	*	20	417 (299, 561)	67.4	88	417 (279, 539)	69.5	108
Primary	364 (230, 526)	70.8	263	452 (301, 646)	57.6	768	432 (280, 607)	61.7	1,031
Secondary	370 (240, 508)	73.5	390	452 (301, 616)	59.4	699	417 (274, 562)	65.4	1,089
More than secondary	344 (221, 486)	78.5	92	471 (343, 619)	58.0	125	410 (254, 552)	68.4	217

**Religion**

Catholic	362 (212, 507)	74.6	141	440 (315, 615)	58.8	310	412 (271, 572)	64.9	451
Protestant	363 (233, 505)	74.4	529	455 (306, 629)	58.1	1,153	426 (279, 583)	64.2	1,682
Muslim	*	*	5	*	*	7	*	*	12
Other	345 (226, 507)	71.6	63	417 (277, 599)	64.0	200	397 (265, 547)	66.2	263
None	483 (331, 547)	(51.9)	27	*	*	10	443 (295, 547)	(58.2)	37

**Age**

15–19	*	*	23	475 (345, 629)	56.4	65	492 (345, 655)	53.2	88
20–24	381 (270, 459)	(79.6)	27	475 (320, 665)	54.1	169	449 (314, 620)	58.8	196
25–29	383 (247, 543)	64.9	57	475 (307, 662)	54.2	223	456 (289, 630)	57.1	280
30–34	330 (205, 466)	78.2	106	444 (296, 612)	58.2	301	401 (249, 559)	64.5	407
35–39	357 (217, 488)	75.8	116	439 (302, 574)	62.7	286	412 (276, 536)	67.5	402
40–44	382 (210, 531)	67.7	162	457 (284, 622)	58.0	292	425 (249, 574)	62.3	454
45–49	351 (227, 471)	78.8	125	428 (291, 624)	64.4	159	400 (269, 548)	71.5	284
50–54	326 (259, 489)	76.2	97	427 (307, 606)	59.2	117	394 (280, 560)	68.2	214
55–59	352 (225, 474)	77.3	53	400 (269, 596)	69.6	68	384 (250, 555)	73.2	121
Total 15–49	372 (228, 512)	72.5	616	453 (303, 629)	58.4	1,495	429 (276, 578)	63.4	2,111
<b>Total 15–59</b>	365 (231, 510)	73.2	766	450 (303, 623)	58.9	1,680	421 (275, 576)	64.3	2,446

Figures in parentheses are based on 25–49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

### 3.4 90-90-90 Indicators

In order to bring the HIV epidemic under control, UNAIDS has set an ambitious target referred to as “90-90-90.” By 2020, 90% of all PLHIV will know their HIV status; 90% of all people with diagnosed HIV infection will receive sustained ART; and 90% of all people receiving ART will achieve viral suppression (UNAIDS 2014).

#### *Self-Reported HIV Testing*

HIV testing is currently one of the key strategies to control the epidemic, since it identifies PLHIV and enables them to link to care. To increase national coverage of testing, the government of the Republic of Zambia has instituted guidelines for index case testing, provider initiated testing and counselling, peer approach for key populations, self-testing, and implementation of a unique identifier for HIV testing and services, among other strategies.

Almost two-thirds of men (65%) ages 15-59 reported ever having been tested for HIV and having received their results, while approximately a third of them (34.7%) reported testing and receiving their results in the year preceding the survey. More than three-fourths (79.3%) of males ages 25-29 have ever been tested and received their results, compared to only 27.2% of males ages 15-19. Among HIV-positive men, 85.9% had ever been tested and received their results, while 40% reported having been tested and received their results in the 12 months preceding the survey. Among HIV-negative men, 62.6% had ever been tested and received their results, and a third (33.4%) reported testing during the 12 months preceding the survey (Table 3.4.A).

Over 80% of widowed and married men ages 15-59 had ever been tested and received their results for HIV (81.0% and 80.9%, respectively). Among those who were married or living with a partner, 42.4% had been tested and received their results in the year preceding the survey, while one quarter (25.6%) of those who were never married had been tested and received their results in the year preceding the survey (Table 3.4.A).

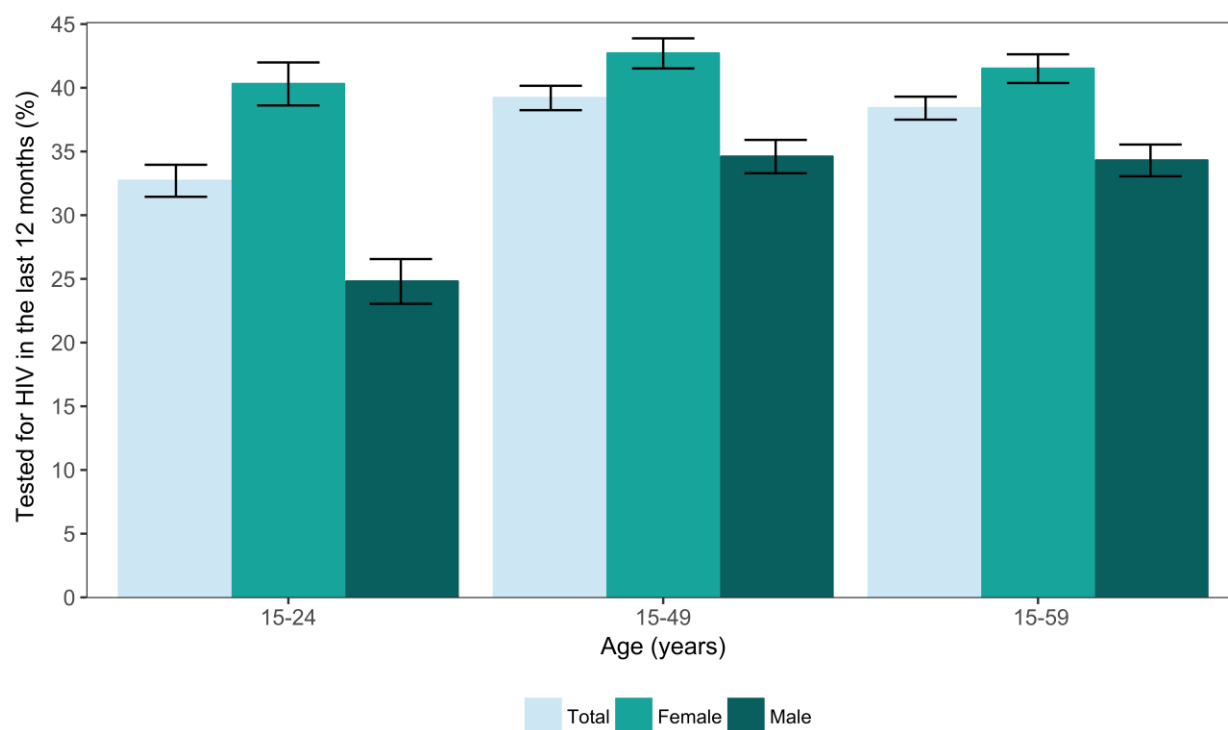
Coverage of testing was 84.5% among males with more than secondary education, compared to 57.0% and 62.0% among those with primary education or no education, respectively. A similar pattern, but with half the frequencies of testing, was observed across education levels for coverage of testing in the preceding 12 months (Table 3.4.A).

Among females ages 15-59, 92.9% of those who were HIV positive had ever been tested for HIV and received their results, while among HIV-negative females, 76.8% had ever been tested and received their results. Among females who tested HIV positive, a quarter (25.2%) had received HIV testing and their results in the year preceding the survey, compared to almost twice as many (43.9%) HIV-negative females (Table 3.4.B).

Among females ages 15-59 who were married or living with a partner, 90.3% had ever been tested and received their results, as compared to 56.2% of females who had never been married. There were more females who had ever been tested for HIV and received their results among those living in urban areas (81.4%) than among those living in rural areas (77.4%); and among those who had more than secondary education (93.4%) than among those with lower education attainment. The percentage of those ever tested ranged from 45.4% among 15- to 19-year-old women to 94.5% for those ages 25-29 (Table 3.4.B).

In the 12 months preceding the survey, 34.7% of all males and 42.0% of females ages 15-59 were tested for HIV. The coverage of testing in the year preceding the survey peaked for ages 30-34 among males, at 46.1%, and for ages 20-24, at 53.4%, among females. Among females ages 15-19 and 50-59, recent testing coverage was only about half of that among females ages 25-29. Among males 15-19, the coverage of recent testing was a third of that among 25- to 29-year-olds (Table 3.4.A and 3.4.B; Figure 3.4.A).

**Figure 3.4.A Self-reported HIV testing in the last 12 months, by sex and age**



### *Self-Reported HIV Treatment Status*

Among HIV-positive males ages 15-59, about one-third (37.8%) were unaware of their HIV-positive status, while over half (53.6%) reported they are receiving ART. Two-thirds (67.1%) of HIV-positive males ages 25-29 reported being unaware of their HIV status, followed by 57.2% of 20- to 24-year-olds and 54.8% of 30- to 34-year-olds. Only one-fifth of those HIV-positive males between ages 50-59 reported not being aware of their HIV status. Among never-married HIV-positive males, more than half (60.8%) were unaware of their HIV-positive status, while around one-third (35.9%) were on ART. By comparison, 33.2% of HIV-positive married men were unaware of their status, while 57.1% were on ART. Among HIV-positive men who had more than a secondary education, 23.7% were unaware of their HIV status, as compared to 40.2% of primary-school educated men. Lack of knowledge of HIV status among HIV-positive men ages 15-59 varied geographically, from 26.6% unaware in Eastern Province to 57.1% unaware in Luapula. Coverage of ART (according to self-report) also varied geographically and peaked in Eastern at 68.0%, as compared to 30.3% in Northern Province (Table 3.4.C).

Overall, the percentage of HIV-positive females ages 15-59 who were unaware of their HIV status was 31.7%. Over half (57.7%) of HIV-positive females in this age group reported being on ART, and 10.7% reported being aware of their status but not receiving ART. Over two-thirds of 15- to 19-year-old females (70.1%) and over half of the 20- to 24-year-olds (55.2%) were unaware of their HIV-positive status prior to the survey (Table 3.4.D).

Among never-married HIV-positive women, almost half (49.3%) were unaware of their status, as compared to a quarter (26.6%) of HIV-positive women who were married or living with a partner. By comparison, 63.0% of married HIV-positive women reported being on ART, while 40.4% of never-married HIV-positive women reported being on ART. Among HIV-positive women who had more than a secondary education, 27.2% indicated that they were unaware of their status, while 58.9% reported being on ART. Among those HIV-positive women who had no education, 21.3% were unaware of their status, and 61.8% reported being on ART. As among HIV-positive men, lack of awareness of HIV status among HIV-positive females varied geographically, from 23.8% unaware in Southern Province to 42.8% in Luapula. Coverage of ART (according to self-report) also ranged geographically and peaked in Southern Province, at 69.0%, as compared to 39.6% in Northern Province (Table 3.4.D).

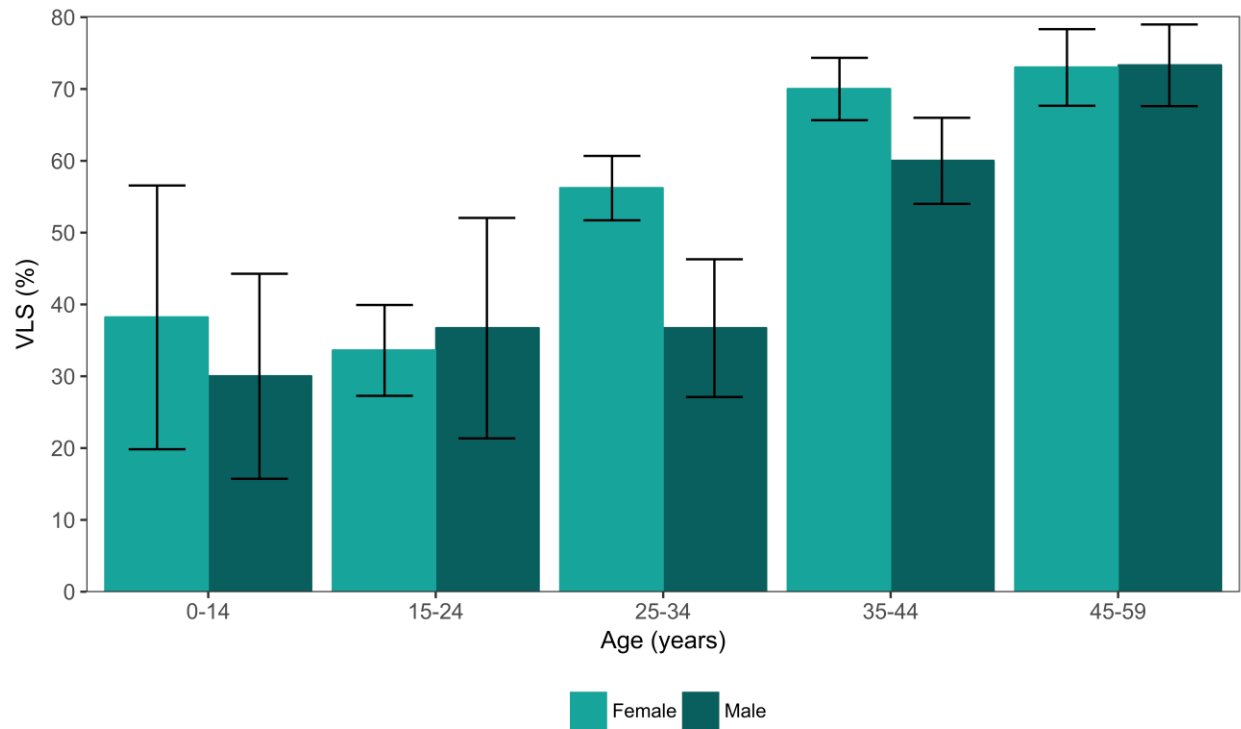
### *Viral Load Suppression*

Among PLHIV ages 15-59 in Zambia, the prevalence of VLS (defined as HIV RNA < 1,000 copies/mL) was 59.1%. Of PLHIV who reported current use of ART, 89.3% were virally suppressed (87.7% of males and 90.1% of females). Among those who reported being previously diagnosed but not on ART, the prevalence of VLS was low: 5.3% for males, and 14.3% for females. Males with more than secondary education had the highest prevalence of VLS (71.9%), as well as men who were married or living with a partner (60.5%). Among HIV-positive females, VLS was observed in 68.4% for those who were widowed and 66.2% among those married or living with a partner (Table 3.4.E).

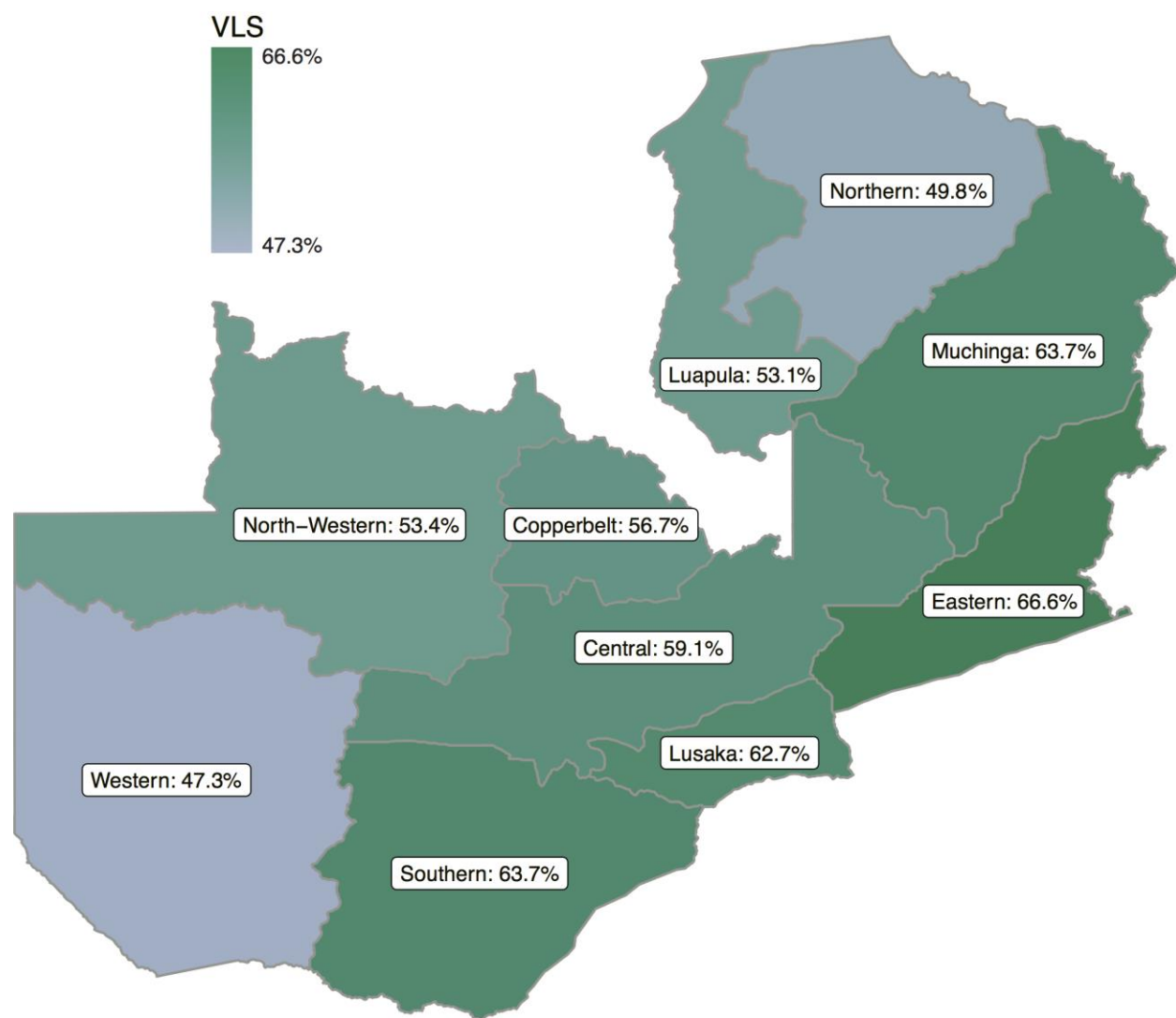
In general, the prevalence of VLS increased with increasing age, from 30.7% among HIV-positive 15- to 19-year-olds to 79.0% among 55- to 59-year-olds. This trajectory was observed across both sexes, and it corresponds closely with the increase with age in the coverage of diagnosis and ART described above. Only a third (33.6) of 0- to 14-year-olds were virally suppressed (Table 3.5.F; Figure 3.4.B).

Among HIV-positive adults ages 15-59, the prevalence of VLS among PLHIV varies geographically across Zambia, ranging from 47.3% in Western Province to 66.6% in Eastern Province. The prevalence of VLS was above 60% in Muchinga, Lusaka, Southern, and Eastern Provinces. Comparatively, in the remaining six provinces, prevalence of VLS was less than 60% (Table 3.4.E; Figure 3.4.C and 3.4.D).

**Figure 3.4.B Viral load suppression among persons living with HIV ages 0-59, by sex and age**

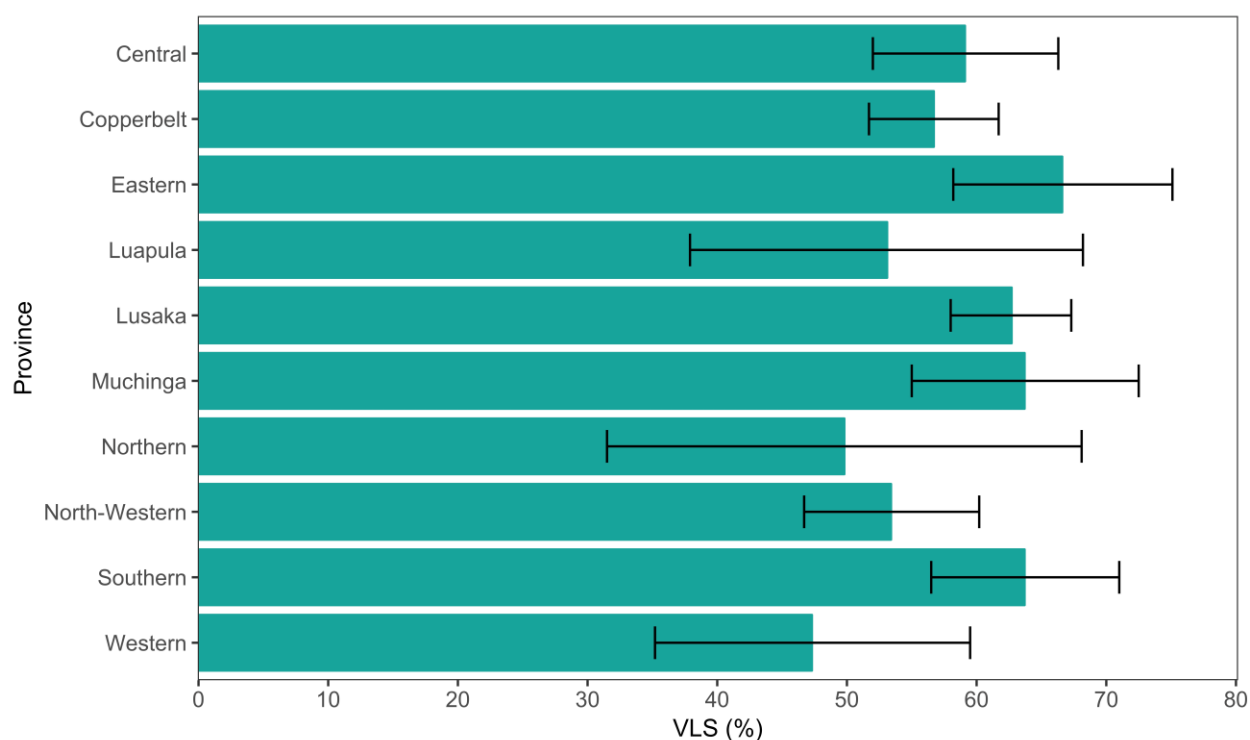


**Figure 3.4.C Viral load suppression among HIV-positive adults ages 15-59, by province**





**Figure 3.4.D Viral load suppression among HIV-positive adults ages 15-59, by province**



### Overall 90-90-90

#### Key Findings

**Diagnosed:** In Zambia, 66.0% of PLHIV ages 15-59 report knowing their HIV status: 68.3% of HIV-positive females and 62.2% of HIV-positive males.

**On Treatment:** Among PLHIV ages 15-59 who know their HIV status, 85.0% self-report current use of ART: 84.4% of HIV-positive females and 86.2% of HIV-positive males.

**Virally Suppressed:** Among PLHIV ages 15-59 who self-report current use of ART, 89.3% are virally suppressed: 90.1% of HIV-positive females and 87.7% of HIV-positive males.

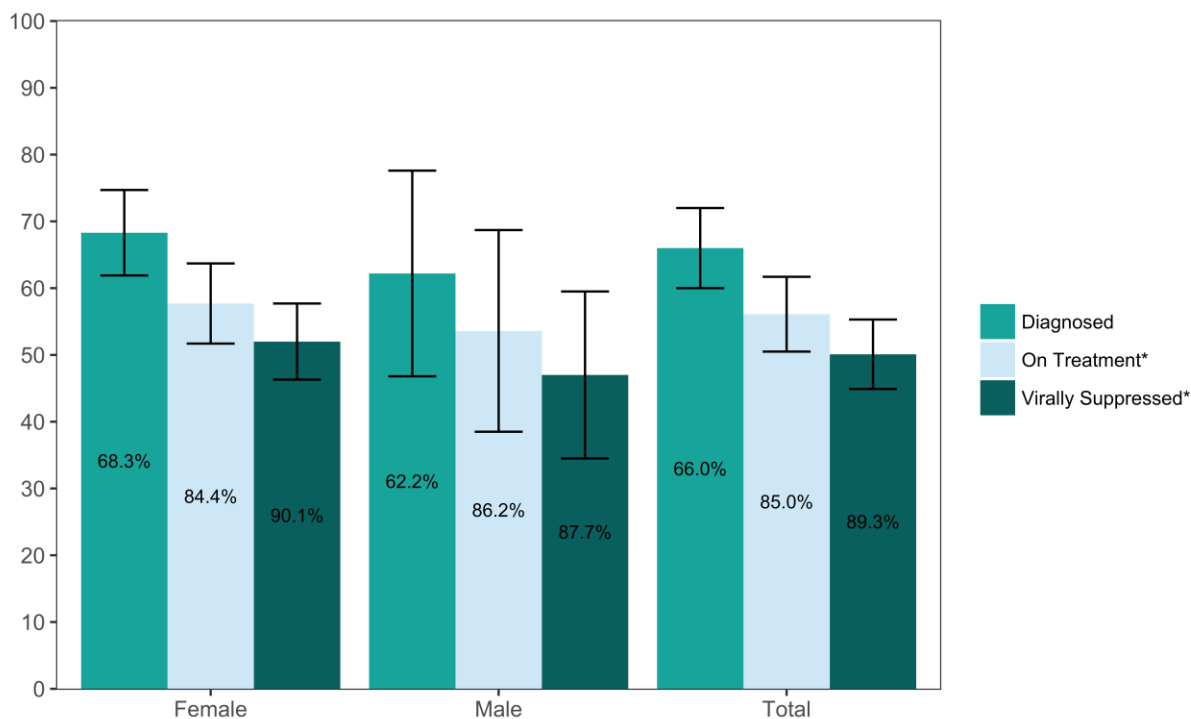
Nearly two-thirds (66.0%) of HIV-positive persons ages 15-59 reported being aware of their HIV status: 68.3% of HIV-positive females and 62.2% of HIV-positive males know their HIV status. Among persons who were aware of their HIV status, 85.0% self-reported being on ART, and of those who self-reported ART, 89.3% are virally suppressed. Among males who were aware of their HIV status, 86.2% self-reported being on ART, and of those, 87.7% are virally suppressed. Among females who were aware of their HIV status, 84.4% self-reported being on ART, and of those, 90.1% were virally suppressed (Table 3.4.G, Figure 3.4.E).

Among HIV-positive males ages 35-49, 69.6% reported knowledge of their HIV status, with 86.3% of them reporting being on ART; among those, 87.6% were virally suppressed. In contrast, only 40.6% of HIV-

positive 25- to 34-year-old men reported being aware of their status; of those, 72.1% reported being on ART, and among them, 90.7% were virally suppressed (Table 3.4.G).

Among HIV-positive women ages 15-24, 40.1% self-reported knowledge of their HIV status. Of these, 77.9% reported being on ART, and 78.1% of those who self-reported ART were virally suppressed. The percentage of HIV-positive women aware of their status ranged from 40.1% among those ages 15-24 to 76.7% among those ages 35-49 (Table 3.4.G).

**Figure 3.4.E: Progress toward the 90-90-90 goals among PLHIV ages 15-59, by sex**



\*Inset numbers are conditional percentages. See Key Findings box above.

**Table 3.4.A HIV testing: Males**

Percentage of males ages 15-59 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, ZAMPHIA 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	Number
<b>Result of PHIA survey HIV test</b>			
HIV positive	85.9	40.0	767
HIV negative	62.6	33.4	7,287
Not tested	66.7	40.3	1,019
<b>Residence</b>			
Urban	70.0	37.1	3,741
Rural	61.0	32.8	5,332
<b>Province</b>			
Central	59.6	32.3	784
Copperbelt	64.7	33.4	1,537
Eastern	67.8	33.0	873
Luapula	57.9	27.6	472
Lusaka	69.7	37.7	1,430
Muchinga	61.7	30.3	841
Northern	58.5	33.0	765
North-Western	60.8	31.4	852
Southern	68.9	40.0	1,075
Western	71.2	44.0	444
<b>Marital status</b>			
Never married	46.4	25.6	3,748
Married or living together	80.9	42.4	4,817
Divorced or separated	73.4	41.3	376
Widowed	81.0	37.6	63
<b>Education</b>			
No education	62.0	32.5	280
Primary	57.0	29.3	3,487
Secondary	67.2	37.2	4,417
More than secondary	84.5	43.3	881
<b>Religion</b>			
Catholic	64.6	33.1	1,789
Protestant	65.3	35.5	6,372
Muslim	77.5	44.8	50
Other	65.8	34.4	668
None	56.0	24.8	184

<b>Age</b>			
15–19	27.2	14.9	1,988
20–24	65.6	36.3	1,482
25–29	79.3	45.2	1,193
30–34	83.3	46.1	1,145
35–39	82.4	42.8	943
40–44	79.3	39.9	842
45–49	77.0	39.5	625
50–54	72.5	32.4	487
55–59	68.7	30.5	368
Total 15–24	44.9	24.8	3,470
Total 15–49	64.5	35.0	8,218
<b>Total 15–59</b>	65.0	34.7	9,073

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**Table 3.4.B HIV testing: Females**

Percentage of females ages 15-59 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, ZAMPHIA 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 <sup>1</sup>	Number
<b>Result of PHIA survey HIV test</b>			
HIV positive	92.9	25.2	1,674
HIV negative	76.8	43.9	9,230
Not tested	79.2	50.1	1,121
<b>Residence</b>			
Urban	81.4	43.6	5,463
Rural	77.4	40.6	6,562
<b>Province</b>			
Central	80.0	40.3	993
Copperbelt	77.9	39.4	2,051
Eastern	82.9	44.0	1,145
Luapula	71.0	36.9	659
Lusaka	83.4	45.8	2,198
Muchinga	76.3	37.6	1,066
Northern	69.6	36.5	942
North-Western	78.0	43.2	1,106
Southern	81.8	45.1	1,280
Western	83.2	46.3	585
<b>Marital status</b>			
Never married	56.2	33.5	3,281
Married or living together	90.3	47.6	6,962
Divorced or separated	86.5	42.3	1,123
Widowed	84.7	29.7	581
<b>Education</b>			
No education	74.4	37.4	838
Primary	79.4	39.9	5,644
Secondary	77.4	43.6	4,729
More than secondary	93.4	50.9	809
<b>Religion</b>			
Catholic	78.1	40.7	2,170
Protestant	79.5	42.4	8,262
Muslim	83.3	(43.2)	44
Other	79.9	42.0	1,485
None	72.2	34.1	56

<b>Age</b>			
15–19	45.4	28.8	2,316
20–24	88.3	53.4	2,246
25–29	94.5	52.6	1,794
30–34	94.2	48.3	1,602
35–39	91.9	44.6	1,288
40–44	88.6	37.8	1,062
45–49	81.9	30.9	673
50–54	68.3	28.2	624
55–59	69.7	26.3	420
Total 15–24	65.4	40.3	4,562
Total 15–49	80.1	43.2	10,981
<b>Total 15–59</b>	79.2	42.0	12,025

Figures in parentheses are based on 25–49 unweighted cases.

**Table 3.4.C HIV treatment status: Males**

Percent distribution of HIV-positive males ages 15-59 by self-reported HIV treatment status, by selected demographic characteristics, ZAMPHIA 2016

Characteristic	Unaware of HIV status	Aware of HIV status		Total	Number
		Not on ART	On ART <sup>1</sup>		
<b>Residence</b>					
Urban	32.8	7.8	59.4	100.0	400
Rural	44.3	9.6	46.1	100.0	364
<b>Province</b>					
Central	43.9	9.4	46.8	100.0	70
Copperbelt	34.1	11.6	54.3	100.0	152
Eastern	(26.6)	(5.4)	(68.0)	100.0	47
Luapula	(57.1)	(4.7)	(38.1)	100.0	34
Lusaka	31.9	3.2	64.9	100.0	167
Muchinga	(33.8)	(8.1)	(58.1)	100.0	28
Northern	(54.2)	(15.5)	(30.3)	100.0	49
North-Western	(51.2)	(4.6)	(44.1)	100.0	39
Southern	34.8	13.8	51.4	100.0	122
Western	45.6	10.5	43.9	100.0	56
<b>Marital status</b>					
Never married	60.8	3.3	35.9	100.0	88
Married or living together	33.2	9.7	57.1	100.0	571
Divorced or separated	46.2	7.3	46.5	100.0	75
Widowed	(25.3)	(10.4)	(64.3)	100.0	28
<b>Education</b>					
No education	*	*	*	*	20
Primary	40.2	9.4	50.4	100.0	262
Secondary	39.7	8.3	52.0	100.0	391
More than secondary	23.7	6.5	69.9	100.0	90
<b>Religion</b>					
Catholic	42.3	9.2	48.5	100.0	142
Protestant	37.3	9.3	53.5	100.0	528
Muslim	*	*	*	*	5
Other	35.3	4.5	60.3	100.0	62
No religion	(38.8)	(0.0)	(61.2)	100.0	26
<b>Age</b>					
15-19	*	*	*	*	24
20-24	(57.2)	(5.5)	(37.3)	100.0	29
25-29	67.1	7.9	25.0	100.0	57
30-34	54.8	13.4	31.8	100.0	108
35-39	39.2	12.3	48.5	100.0	117
40-44	28.3	9.0	62.7	100.0	160
45-49	23.5	7.1	69.4	100.0	122
50-54	20.8	3.2	76.1	100.0	96
55-59	20.8	4.4	74.8	100.0	51
Total 15-49	41.2	9.6	49.1	100.0	617
<b>Total 15-59</b>	37.8	8.6	53.6	100.0	764

Figures in parentheses are based on 25-49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

**Table 3.4.D HIV treatment status: Females**

Percent distribution of HIV-positive females ages 15-59 by self-reported HIV treatment status, by selected demographic characteristics, ZAMPHIA 2016

Characteristic	Unaware of HIV status	Aware of HIV status		Total	Number
		Not on ART	On ART <sup>1</sup>		
<b>Residence</b>					
Urban	28.9	10.7	60.4	100.0	997
Rural	35.7	10.6	53.6	100.0	668
<b>Province</b>					
Central	31.9	7.9	60.2	100.0	159
Copperbelt	31.2	11.1	57.7	100.0	352
Eastern	24.3	13.4	62.3	100.0	129
Luapula	42.8	6.5	50.7	100.0	71
Lusaka	29.2	11.9	58.9	100.0	412
Muchinga	37.9	5.2	56.9	100.0	80
Northern	40.7	19.7	39.6	100.0	79
North-Western	42.5	8.0	49.4	100.0	96
Southern	23.8	7.2	69.0	100.0	183
Western	40.8	11.2	48.0	100.0	104
<b>Marital status</b>					
Never married	49.3	10.3	40.4	100.0	235
Married or living together	26.6	10.5	63.0	100.0	849
Divorced or separated	37.8	10.4	51.8	100.0	315
Widowed	22.9	12.4	64.7	100.0	261
<b>Education</b>					
No education	21.3	16.8	61.8	100.0	88
Primary	33.1	10.0	57.0	100.0	766
Secondary	32.3	10.1	57.7	100.0	690
More than secondary	27.2	13.8	58.9	100.0	121
<b>Religion</b>					
Catholic	28.9	10.0	61.1	100.0	307
Protestant	32.0	10.7	57.3	100.0	1,144
Muslim	*	*	*	*	7
Other	35.9	10.5	53.7	100.0	197
None	*	*	*	*	10
<b>Age</b>					
15–19	70.1	3.4	26.5	100.0	67
20–24	55.2	11.4	33.3	100.0	167
25–29	33.4	12.1	54.5	100.0	222
30–34	28.5	17.3	54.2	100.0	299
35–39	23.3	12.2	64.5	100.0	280
40–44	20.3	8.2	71.5	100.0	290
45–49	28.1	5.5	66.3	100.0	157
50–54	24.9	7.9	67.2	100.0	116
55–59	24.7	2.8	72.5	100.0	67
Total 15–49	32.4	11.2	56.3	100.0	1,482
<b>Total 15–59</b>	31.7	10.7	57.7	100.0	1,665

An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.



**Table 3.4.E Viral load suppression prevalence by demographic characteristics**

Among HIV-positive persons ages 15-59, percentage with VLS (<1,000 copies/ml), by sex, self-reported diagnosis and ART status, and selected demographic characteristics, ZAMPHIA 2016

Characteristic	Males		Females		Total	
	Percentage VLS	Number	Percentage VLS	Number	Percentage VLS	Number
<b>Self-reported diagnosis and treatment status</b>						
Not previously diagnosed	23.2	279	19.8	491	21.2	770
Previously diagnosed, not on ART	5.3	63	14.3	164	11.5	227
Previously diagnosed, on ART	87.7	411	90.1	993	89.3	1,404
Missing	*	4	*	4	*	8
<b>Residence</b>						
Urban	60.5	399	62.4	994	61.7	1,393
Rural	52.6	358	57.2	658	55.4	1,016
<b>Province</b>						
Central	56.1	70	60.8	159	59.1	229
Copperbelt	49.7	152	60.6	352	56.7	504
Eastern	(68.6)	47	65.8	129	66.6	176
Luapula	(45.5)	34	57.6	71	53.1	105
Lusaka	67.5	167	59.6	412	62.7	579
Muchinga	(65.1)	28	63.2	80	63.7	108
Northern	(48.8)	41	50.5	68	49.8	109
North-Western	(49.8)	39	55.3	97	53.4	136
Southern	56.0	122	70.2	181	63.7	303
Western	45.6	57	48.4	103	47.3	160
<b>Marital status</b>						
Never married	40.5	88	40.2	234	40.3	322
Married or living together	60.5	564	66.2	840	63.6	1,404
Divorced or separated	54.2	75	54.2	316	54.2	391
Widowed	(57.6)	28	68.4	257	67.1	285
<b>Education</b>						
No education	*	20	56.3	86	55.2	106
Primary	52.5	256	60.3	757	57.9	1,013
Secondary	57.0	391	60.7	687	59.1	1,078
More than secondary	71.9	89	61.3	122	66.7	211

<b>Religion</b>						
Catholic	55.2	140	59.8	305	58.1	445
Protestant	57.1	523	61.1	1,137	59.6	1,660
Muslim	*	5	*	7	*	12
None	(64.6)	26	*	10	(62.9)	36
Other	58.0	62	56.6	193	57.0	255
<b>Total 15–59</b>	57.1	757	60.3	1,652	59.1	2,409

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Figures in parentheses are based on 25–49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

**Table 3.4.F Viral load suppression prevalence by age**

Among HIV-positive persons ages 0-59, percentage with VLS (<1,000 copies/ml), by sex and age, ZAMPHIA 2016

Age	Males		Females		Total	
	Percentage VLS <sup>1</sup>	Number	Percentage VLS <sup>1</sup>	Number	Percentage VLS <sup>1</sup>	Number
0-4	*	13	*	6	*	19
5-9	(22.4)	30	*	21	22.5	51
10-14	*	9	*	11	*	20
15-19	*	25	25.1	67	30.7	92
20-24	(31.1)	28	37.5	166	36.3	194
25-29	36.8	53	57.2	220	52.0	273
30-34	36.6	107	55.4	294	49.3	401
35-39	51.9	115	69.6	279	63.0	394
40-44	66.5	160	70.4	289	68.7	449
45-49	66.0	122	72.5	155	69.3	277
50-54	78.3	95	71.6	114	75.1	209
55-59	82.3	52	76.1	68	79.0	120
Total 15-24	36.7	53	33.6	233	34.3	286
Total 15-49	52.5	610	58.8	1,470	56.5	2,080
<b>Total 15-59</b>	<b>57.1</b>	<b>757</b>	<b>60.3</b>	<b>1,652</b>	<b>59.1</b>	<b>2,409</b>

Figures in parentheses are based on 25-49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

<b>Table 3.4.G 90-90-90: Conditional percentages</b>						
90-90-90 targets among people living with HIV ages 15-59, by sex and age, ZAMPHIA 2016						
Age	Diagnosed					
	Males		Females		Total	
	Percentage who self-report HIV positive	Number	Percentage who self-report HIV positive	Number	Percentage who self-report HIV positive	Number
15–24	40.6	53	40.1	234	40.2	287
25–34	40.6	165	69.3	521	60.7	686
35–49	69.6	399	76.7	727	73.7	1,126
15–49	58.8	617	67.6	1,482	64.4	2,099
<b>15–59</b>	62.2	764	68.3	1,665	66.0	2,429

Age	On Treatment					
	Among males who self-report HIV positive		Among females who self-report HIV positive		Total	
	Percentage who self-report ART	Number	Percentage who self-report ART	Number	Percentage who self-report ART	Number
15–24	*	20	77.9	98	80.0	118
25–34	72.1	68	78.4	362	77.1	430
35–49	86.3	277	88.0	564	87.3	841
15–49	83.6	365	83.4	1,024	83.5	1,389
<b>15–59</b>	86.2	480	84.4	1,162	85.0	1,642

Age	Virally Suppressed					
	Among males who self-report ART		Among females who self-report ART		Total	
	Percentage virally suppressed	Number	Percentage virally suppressed	Number	Percentage virally suppressed	Number
15–24	*	17	78.1	76	71.3	93
25–34	(90.7)	47	88.6	288	89.0	335
35–49	87.6	238	91.2	502	89.7	740
15–49	85.6	302	89.0	866	87.9	1,168
<b>15–59</b>	87.7	411	90.1	993	89.3	1,404

Figures in parentheses are based on 25-49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

### 3.5 Prevention of Mother-to-Child Transmission of HIV

#### Key Findings

**Antenatal care:** In Zambia, 99.0% of women ages 15-49 who delivered in the three years preceding the survey attended at least one antenatal visit for their most recent birth.

**Prevention of mother-to-child transmission:** Among women ages 15-49 who delivered in the 12 months preceding the survey, 93.1% knew their HIV status; while 98.9% of HIV-positive women who gave birth in the 12 months preceding the survey received ARVs.

Almost all (99.0%) women ages 15-49 who delivered in the three years preceding the survey attended at least one antenatal care (ANC) visit for their most recent birth. Attendance to at least one ANC visit is almost universal, regardless of urban/rural residence, province, marital status, education, and age (Table 3.5.A).

Among women ages 15-49 who delivered within the 12 months preceding the survey, 93.1% reported that they knew their HIV status: 98.6% in urban areas and 89.9% in rural areas. In urban areas, 8.5% already knew that they were HIV positive and 2.5% tested positive during ANC. In contrast, in rural areas, 2.6% already knew that they were HIV positive and 1.8% tested positive during ANC. There was a geographical variation in the proportion of women who knew their HIV status, ranging from 83.5% in Luapula to 97.9% in Central and Lusaka Provinces among women aged 15-49 who delivered within the 12 months preceding the survey (Table 3.5.B).

Among HIV-positive women ages 15-49 who delivered in the 12 months preceding the survey, 98.9% received ARVs: 55.8% were already taking ARVs at the time of their first ANC visit, while 43.1% were newly initiated on ARVs during pregnancy or labor and delivery. ARV use varied between rural and urban areas among HIV-positive women ages 15-49 who delivered in the 12 months preceding the survey; 64.3% of women in urban areas were already taking ARVs at their first ANC visit, as compared to 43.2% of women in rural areas. Further, 54.0% of women in rural areas were newly initiated on ART during pregnancy or labor and delivery as compared to 35.7% of women in urban areas (Table 3.5.C).

Among last-born infants delivered by HIV-positive women ages 15-49 during the 36 months preceding the survey, 58.4% of them were tested for HIV within 2 months of birth, while 25.6% were tested between 2 to 12 months of birth (Table 3.5.D).

More than half (59.0%) of women ages 15-49 who gave birth during the three years preceding the survey were breastfeeding their last-born child at the time of the survey. Almost half (44.9%) of HIV-positive women were breastfeeding at the time of the survey, compared to 60.2% of HIV-negative women. Among HIV-positive women, 5.5% had never breastfed their last-born child, as compared to 0.6% of HIV-negative women (Table 3.5.E).

**Table 3.5.A Antenatal care**

Among women ages 15-49 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, ZAMPHIA 2016

Characteristic	Percentage who attended at least one ANC visit	Number
<b>Residence</b>		
Urban	99.5	1,540
Rural	98.8	2,624
<b>Province</b>		
Central	98.9	350
Copperbelt	99.1	641
Eastern	99.3	401
Luapula	98.3	262
Lusaka	99.4	589
Muchinga	97.2	462
Northern	99.7	368
North-Western	99.8	389
Southern	99.6	458
Western	98.0	244
<b>Marital status</b>		
Never married	98.9	512
Married or living together	99.1	3,260
Divorced or separated	98.4	314
Widowed	98.5	69
<b>Education</b>		
No education	97.8	296
Primary	98.7	2,153
Secondary	99.6	1,505
More than secondary	100.0	209
<b>Religion</b>		
Catholic	99.5	704
Protestant	98.9	2,931
Muslim	*	11
Other	99.0	496
None	*	19
<b>Age</b>		
15–19	99.2	439
20–24	99.3	1,152
25–29	99.1	976
30–34	98.6	808
35–39	98.9	508
40–44	98.9	234
45–49	(100.0)	47
<b>Total 15–49</b>	99.0	4,164

Figures in parentheses are based on 25-49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

**Table 3.5.B Prevention of mother-to-child transmission: Known HIV status**

Among women ages 15-49 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, ZAMPHIA 2016

Characteristic	Tested for HIV and received result <sup>1</sup>		Percentage who already knew they were HIV positive	Total percentage with known HIV status <sup>2</sup>	Number of women who delivered within the past 12 months
	Percentage who tested HIV positive	Percentage who tested HIV negative			
<b>Residence</b>					
Urban	2.5	87.6	8.5	98.6	560
Rural	1.8	85.5	2.6	89.9	998
<b>Province</b>					
Central	1.3	90.5	6.2	97.9	138
Copperbelt	2.7	86.4	8.0	97.1	232
Eastern	2.0	93.5	2.3	97.7	165
Luapula	0.8	81.1	1.5	83.5	107
Lusaka	3.0	87.3	7.6	97.9	210
Muchinga	0.8	81.5	1.7	84.0	161
Northern	0.6	82.4	3.7	86.7	157
North-Western	1.2	84.3	2.1	87.6	135
Southern	4.3	86.9	5.4	96.5	175
Western	2.6	81.4	2.9	86.9	78
<b>Marital status</b>					
Never married	1.8	86.9	2.3	91.0	210
Married or living together	2.1	87.1	4.3	93.5	1,233
Divorced or separated	1.5	80.0	9.9	91.4	90
Widowed	*	*	*	*	20
<b>Education</b>					
No education	2.0	80.4	4.9	87.2	98
Primary	1.5	86.0	3.2	90.7	793
Secondary	3.2	87.6	5.7	96.5	580
More than secondary	0.0	88.2	11.8	100.0	86
<b>Religion</b>					
Catholic	3.0	80.6	6.0	89.5	266
Protestant	1.9	86.7	4.7	93.4	1,108
Muslim	*	*	*	*	1
Other	2.0	91.7	2.9	96.6	177
None	*	*	*	*	5

**Age**

15–19	0.5	83.9	0.4	84.8	216
20–24	1.6	89.0	3.3	94.0	475
25–29	2.9	86.3	4.9	94.2	325
30–34	3.7	85.9	6.2	95.7	286
35–39	1.0	83.3	11.4	95.7	173
40–44	3.9	82.8	8.0	94.8	73
45–49	*	*	*	*	10
<b>Total 15–49</b>	2.1	86.3	4.7	93.1	1,558

An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.



**Table 3.5.C Prevention of mother-to-child transmission: HIV-positive pregnant women who received antiretroviral therapy**

Among HIV-positive women ages 15-49 who gave birth within the past 12 months, percentage who received ARVs during pregnancy to reduce the risk of mother-to-child-transmission, by residence, ZAMPHIA 2016

Characteristic	Percentage who were already taking ARVs at the time of their first ANC visit	Percentage who were newly initiated on ARVs during pregnancy or labor and delivery	Total percentage who received ARVs	Number of HIV-positive women who delivered within the past 12 months
<b>Residence</b>				
Urban	64.3	35.7	100.0	66
Rural	(43.2)	(54.0)	(97.3)	41
<b>Total 15-49</b>	55.8	43.1	98.9	107

Figures in parentheses are based on 25-49 unweighted cases.

**Prevention of mother-to-child transmission: Infant virologic testing**

Among HIV-positive women ages 15-49 who delivered within the past 36 months, percentage whose last-born infant had an HIV test done within 2 months of birth and within 12 months of birth, by result of HIV test, ZAMPHIA 2016

Characteristic	Percentage of infants who had an HIV test done within 2 months of birth	Percentage of infants who had an HIV test done between 2 to 12 months of birth	Number of last-born infants of HIV-positive women who delivered within the past 36 months
Infant HIV status reported by the mother			
HIV positive	*	*	9
HIV negative	66.2	32.4	183
Don't know/other	(78.7)	(19.4)	49
<b>Total</b>	58.4	25.6	284

Figures in parentheses are based on 25-49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 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 3.5.E Breastfeeding status by child's age and mother's HIV status**

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

Characteristic	Never breastfed	Ever breastfed, but not currently breastfeeding	Currently breastfeeding	Total	Number
<b>Child's age (months)</b>					
0-1	0.0	0.0	97.2	100.0	190
2-3	0.6	0.0	99.1	100.0	258
4-5	0.4	0.9	98.0	100.0	233
6-8	0.0	2.8	96.2	100.0	419
9-11	1.7	4.1	92.3	100.0	390
12-17	1.1	13.5	84.0	100.0	758
18-23	1.5	61.7	35.7	100.0	702
24-36	1.4	90.4	6.9	100.0	1,149
<b>Result of mother's PHIA survey HIV test</b>					
HIV positive	5.5	46.2	44.9	100.0	420
HIV negative	0.6	38.2	60.2	100.0	3,341
Not tested	0.5	33.5	64.6	100.0	404
<b>Total</b>	1.1	38.6	59.0	100.0	4,165

### 3.6 Sexual Behavior

Prevalence of HIV was 31.9% among females ages 15-59 who reported having had two or more sexual partners in the 12 months preceding the survey, compared to 12.5% among their male counterparts. HIV prevalence among males who did not have a sexual partner during the 12 months preceding the survey was lower (8.9%) than that of females reporting the same sexual behavior (22.6%), while HIV prevalence was estimated at 10.4% among males and 14.2% among females who had one partner (Table 3.6.A).

Among participants who had their sexual debut before 16 years of age, the proportion of those who were HIV positive was 12.1%. Of those participants who used condoms at last sexual intercourse in the 12 months preceding the survey, 15.0% of males and 28.2% of females were HIV positive, as compared to 9.7% of men and 12.4% of women who reported they did not use a condom at last sexual intercourse (Table 3.6.A).

Among persons ages 15-24, more males (17.1%) than females (9.5%) reported having sexual intercourse before age 15. Sexual debut before age 15 among 15- to 24-year-olds was higher in rural (17.3%) than urban areas (8.6%). The highest prevalence of early sexual debut was observed in North Western Province (29.4%), and the lowest in Copperbelt Province (7.4%). The percentage who reported early sexual debut was highest among those with only primary education, at 17.9%, as compared to 4.1% of persons ages 15-24 who have had more than a secondary education (Table 3.6.B).

Among males ages 15-59 who reported having had sexual intercourse in the 12 months preceding the survey, 42.8% reported having a nonmarital, noncohabitating partner during that time. Of these men, 40.4% used a condom during their last sexual intercourse with a nonmarital, noncohabitating partner. For this risk group, condom use in urban areas was 45.4%, compared to 35.7% in rural areas. Condom use the last time males had sex with a nonmarital, noncohabiting partner during the 12 months preceding the survey varied geographically, from 29.8% in Western Province to 50.2% in Copperbelt Province. More than half (59.7%) of those who had more than secondary education reported condom use the last time they had sex with a nonmarital, noncohabiting partner in the past year, as compared to 32.1% of those with no education (Table 3.6.C).

Among females ages 15-59 who reported having had sexual intercourse in the 12 months preceding the survey, 25.8% reported having a nonmarital, noncohabitating partner during that time. Of these women, 33.5% reported using a condom during their last sexual intercourse with such a partner. Similar to men, the percentage of condom use at last sex with nonmarital, noncohabiting partners among females in this group was higher in urban (39.4%) than in rural areas (27.2%). Condom use among this group of females ranged from 15.0% among those with no education to 54.5% among those with more than secondary education (Table 3.6.D).

**Table 3.6.A HIV prevalence by sexual behavior**

Prevalence of HIV among persons ages 15-59, by sex and sexual behavior characteristics, ZAMPHIA 2016

Characteristic	Males		Females		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
<b>Age at first sexual intercourse</b>						
<16	9.1	2,179	15.6	2,463	12.1	4,642
16–17	10.0	1,231	15.1	2,525	13.1	3,756
18–19	10.7	1,332	16.9	2,272	14.2	3,604
≥ 20	12.4	1,787	18.5	1,936	15.1	3,723
<b>Number of sexual partners and concurrent sexual partners in the past 12 months</b>						
0	8.9	1,409	22.6	1,806	15.6	3,215
1	10.4	3,925	14.2	7,091	12.6	11,016
2 or more	12.5	1,121	31.9	266	15.6	1,387
<b>Condom use at last sexual intercourse in the past 12 months</b>						
Used condom	15.0	1,072	28.2	1,125	20.8	2,197
Did not use condom	9.7	3,967	12.4	6,216	11.2	10,183
No sexual intercourse in the past 12 months	8.9	1,409	22.6	1,806	15.6	3,215
<b>Paid for sexual intercourse in the past 12 months</b>						
Yes	15.0	365	32.2	74	17.4	439
Used condom	15.0	178	(51.1)	32	19.7	210
Did not use condom	14.5	184	(17.2)	41	14.9	225
No	10.3	4,544	14.7	7,200	12.7	11,744
Total 15–49	8.3	7,358	14.3	10,010	11.4	17,368
<b>Total 15–59</b>	9.3	8,142	14.6	10,973	12.0	19,115

<sup>1</sup>Includes persons who paid or received money for sexual intercourse.

Figures in parentheses are based on 25-49 unweighted cases.

**Table 3.6.B Sex before the age of 15**

Percentage of males and females ages 15–24 who have had sexual intercourse before the age of 15, by sex and selected demographic characteristics, ZAMPHIA 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
<b>Residence</b>						
Urban	11.7	1,469	5.8	2,150	8.6	3,619
Rural	21.7	1,938	12.9	2,313	17.3	4,251
<b>Province</b>						
Central	16.3	297	8.0	360	12.3	657
Copperbelt	10.9	578	4.1	799	7.4	1,377
Eastern	22.5	306	13.2	378	17.8	684
Luapula	26.2	177	10.9	248	18.1	425
Lusaka	11.5	575	5.2	857	8.3	1,432
Muchinga	14.2	309	8.3	353	11.4	662
Northern	10.9	287	10.4	357	10.6	644
North-Western	38.1	339	20.5	416	29.4	755
Southern	16.5	398	12.0	501	14.2	899
Western	34.1	141	20.7	194	26.8	335
<b>Marital status</b>						
Never married	17.1	2,973	7.3	2,705	13.0	5,678
Married or living together	17.6	347	12.9	1,503	14.0	1,850
Divorced or separated	(11.2)	40	14.9	191	14.1	231
Widowed	*	0	*	9	*	9
<b>Education</b>						
No education	10.5	52	11.5	149	11.2	201
Primary	21.8	1,165	14.4	1,578	17.9	2,743
Secondary	15.5	2,058	6.9	2,556	11.3	4,614
More than secondary	7.4	130	0.5	179	4.1	309
<b>Religion</b>						
Catholic	16.1	690	8.7	814	12.6	1,504
Protestant	17.5	2,396	9.8	3,076	13.6	5,472
Muslim	*	11	*	14	*	25
Other	16.5	248	9.0	545	11.7	793
None	20.4	60	*	10	18.0	70
<b>Age</b>						
15–19	19.7	1,962	10.6	2,285	15.2	4,247
20–24	14.0	1,445	8.2	2,178	11.0	3,623
<b>Total 15–24</b>	17.1	3,407	9.5	4,463	13.3	7,870

Figures in parentheses are based on 25–49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

**Table 3.6.C Condom use at last sex with a nonmarital, noncohabitating partner: Males**

Among males ages 15-59 who reported having sex in the past 12 months, percentage who reported having a nonmarital, noncohabitating partner in the past 12 months; among those who reported having sex with a nonmarital, noncohabitating partner in the past 12 months, percentage who reported using a condom the last time they had sex with a nonmarital, noncohabitating partner; by selected demographic characteristics, ZAMPHIA 2016

Characteristic	Among males who reported having sex in the past 12 months		Among males who reported having sex with a nonmarital, noncohabitating partner in the past 12 months	
	Percentage who reported having sex with a nonmarital, noncohabitating partner in the past 12 months	Number	Percentage who reported using a condom the last time they had sex with a nonmarital, noncohabitating partner	Number
<b>Residence</b>				
Urban	48.3	2,163	45.4	994
Rural	38.7	3,457	35.7	1,228
<b>Province</b>				
Central	36.9	469	35.8	162
Copperbelt	40.3	903	50.2	342
Eastern	36.0	550	46.4	189
Luapula	36.8	289	37.3	104
Lusaka	54.8	800	43.1	415
Muchinga	29.6	502	41.8	130
Northern	33.0	513	35.8	157
North-Western	48.3	558	31.0	251
Southern	45.2	722	37.1	306
Western	55.9	314	29.8	166
<b>Marital status</b>				
Never married	98.5	1,424	41.8	1,393
Married or living together	15.9	3,929	37.4	586
Divorced or separated	90.6	210	35.9	190
Widowed	(91.9)	32	(47.8)	30
<b>Education</b>				
No education	35.1	176	32.1	57
Primary	34.0	2,202	26.7	684
Secondary	49.8	2,592	43.7	1,207
More than secondary	45.0	648	59.7	273

**Religion**

Catholic	45.1	1,108	44.7	465
Protestant	41.5	3,991	39.7	1,526
Muslim	(47.6)	29	*	13
Other	47.5	381	39.3	173
None	46.1	109	(27.1)	44

**Age**

15–19	96.7	510	34.2	489
20–24	75.0	903	43.5	654
25–29	45.8	872	44.9	389
30–34	29.1	860	41.4	243
35–39	22.2	721	37.8	154
40–44	20.4	661	35.8	131
45–49	20.3	476	38.2	94
50–54	13.7	348	(40.0)	42
55–59	9.7	269	(28.6)	26

<b>Total 15–49</b>	45.9	5,003	40.5	2,154
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<b>Total 15–59</b>	42.8	5,620	40.4	2,222
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Figures in parentheses are based on 25–49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

**Table 3.6.D Condom use at last sex with a nonmarital, noncohabitating partner: Females**

Among females ages 15-59 who reported having sex in the past 12 months, percentage who reported having a nonmarital, noncohabitating partner in the past 12 months; among those who reported having sex with a nonmarital, noncohabitating partner in the past 12 months, percentage who reported using a condom the last time they had sex with a nonmarital, noncohabitating partner; by selected demographic characteristics, ZAMPHIA 2016

Characteristic	Among females who reported having sex in the past 12 months		Among females who reported having sex with a nonmarital, noncohabitating partner in the past 12 months	
	Percentage who reported having sex with a nonmarital, noncohabitating partner in the past 12 months	Number	Percentage who reported using a condom the last time they had sex with a nonmarital, noncohabitating partner	Number
<b>Residence</b>				
Urban	30.2	3,476	39.4	1,016
Rural	22.3	4,569	27.2	945
<b>Province</b>				
Central	22.6	691	33.3	148
Copperbelt	27.2	1,313	38.4	333
Eastern	21.4	800	30.6	162
Luapula	22.1	434	19.5	91
Lusaka	29.8	1,357	41.3	402
Muchinga	14.8	747	30.9	100
Northern	18.2	621	24.9	109
North-Western	32.1	751	25.0	227
Southern	25.8	923	36.9	224
Western	43.7	408	27.0	165
<b>Marital status</b>				
Never married	95.9	1,160	39.4	1,106
Married or living together	3.1	6,141	19.0	184
Divorced or separated	90.9	545	25.4	493
Widowed	88.9	174	30.9	153
<b>Education</b>				
No education	16.9	533	15.0	82
Primary	19.0	4,038	21.9	711
Secondary	34.8	2,895	39.4	964
More than secondary	35.7	575	54.5	202



**Religion**

Catholic	24.4	1,427	35.7	335
Protestant	26.4	5,626	32.6	1,401
Muslim	(18.6)	26	*	5
Other	24.0	926	34.2	208
None	(29.4)	34	*	9

**Age**

15–19	63.2	791	37.1	495
20–24	33.4	1,661	36.5	538
25–29	21.5	1,446	38.8	303
30–34	16.1	1,322	23.5	209
35–39	15.7	1,020	28.5	156
40–44	18.9	772	26.1	139
45–49	14.8	433	23.3	61
50–54	11.4	375	(13.3)	41
55–59	9.3	225	*	19

<b>Total 15–49</b>	26.9	7,445	34.0	1,901
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<b>Total 15–59</b>	25.8	8,045	33.5	1,961
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Figures in parentheses are based on 25-49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

## 3.7 Additional Selected Indicators

### *Syphilis Prevalence*

Overall, the prevalence of having ever been infected with syphilis among 15- to 59-year-olds was 6.8% (7.2% among females and 6.3% among males). The prevalence of ever having been infected with syphilis was lower among HIV-negative (5.5%) than among HIV-positive (16.6%) participants. The overall prevalence of active syphilis infection was 3.0% (3.4% among females and 2.7% among males). The prevalence of active infection was lower among HIV-negative (2.1%) than HIV-positive (9.6%) participants.

The prevalence of having ever been infected with syphilis ranged from a low of 2.9% in Eastern Province to a high of 10.9% in Western Province. Prevalence of active infection was lowest in Eastern Province (1.2%) and highest in Western Province (5.2%). Prevalence of active syphilis in the never married was 1.6%, compared to 6.8% among those widowed. As expected, the prevalence of having ever been infected with syphilis increased with age: from 2.7% among 15- to 19-year-olds to more than 11% among 40- to 59-year-olds (Table 3.7.A).

### *Prevalence of Chronic Active Hepatitis B*

The prevalence of chronic active Hepatitis B infection was four times higher among those ages 15-59 (5.6%) as compared to those ages 0-14 (1.3%). The overall prevalence in the population of those ages 0-59 was 3.5%.

Prevalence among HIV-negative participants ages 15-59 was 5.4% (6.9% among males, 3.9% among females). Prevalence among HIV-positive participants in the same age group was 7.1% (nearly double among males, at 10.2%, when compared with females, at 5.2%). Among those ages 0-14, the prevalence of chronic active Hepatitis B infection was nearly five times higher in those who were HIV positive (5.9%) than in those HIV negative (1.2%; Table 3.7.B).

### *Viral Load Suppression and Severe Immunosuppression*

VLS among persons ages 15-59 was slightly higher among persons who reported being on ART for 12 months or more (90.4%) compared to persons on self-reported ART for less than 12 months (85.0%). Severe immunosuppression (defined as CD4 count < 200 cells/ $\mu$ L) was more frequent among persons who reported having received ART for less than 12 months (16.9%) than among those on ART for 12 months or more (10.2%).

In rural areas, VLS among persons on ART for 12 months or more was 92.5%, compared to 82.3% of those on self-reported ART for less than 12 months, while the frequency of severe immunosuppression was higher among persons on ART for less than 12 months (21.8%) as compared to persons on ART for 12 months or more (8.7%). Among those reporting being on ART for less than 12 months, VLS was more frequent (86.7%), and severe immunosuppression less frequent (13.8%), among those residing in urban areas than among those in rural areas. For those on ART for 12 months or more, those residing in urban areas had slightly lower prevalence of VLS (89.2%) and higher frequency of severe immunosuppression (11.0%) compared to the same group residing in rural areas.

Among those on ART for 12 months or more, VLS prevalence was similar in males and females (90.8% and 90.2%, respectively), but the prevalence of severe immunosuppression was almost double among males when compared with females (14.4% versus 7.9%). Among those on ART for less than 12 months, VLS prevalence was lower in males than in females (78.0% and 89.5%, respectively), and the prevalence of severe immunosuppression was almost three times higher among males when compared with females (27.3% versus 10.1%; Table 3.7.C).

**Table 3.7.A Syphilis prevalence**

Prevalence of syphilis (ever infected and active infection) among persons ages 15-59, by sex, result of PHIA survey HIV test, and selected demographic characteristics, ZAMPHIA 2016

Characteristic	Males			Females			Total		
	Percentage ever infected	Percentage active infection	Number	Percentage ever infected	Percentage active infection	Number	Percentage ever infected	Percentage active infection	Number
<b>Result of PHIA survey HIV test</b>									
HIV positive	18.2	11.3	779	15.6	8.5	1,688	16.6	9.6	2,467
HIV negative	5.1	1.8	7,363	5.8	2.5	9,285	5.5	2.1	16,648
<b>Residence</b>									
Urban	6.8	2.9	3,315	7.7	3.6	5,025	7.2	3.2	8,340
Rural	6.0	2.5	4,827	6.9	3.2	5,948	6.4	2.8	10,775
<b>Province</b>									
Central	8.6	3.8	702	8.1	3.8	889	8.3	3.8	1,591
Copperbelt	8.2	2.7	1,386	9.6	3.6	1,898	8.9	3.2	3,284
Eastern	1.9	0.7	819	3.9	1.7	1,070	2.9	1.2	1,889
Luapula	7.3	3.4	426	8.6	5.1	590	8.0	4.3	1,016
Lusaka	5.2	2.5	1,242	7.0	3.9	2,003	6.1	3.2	3,245
Muchinga	5.8	2.3	758	4.7	2.7	971	5.2	2.5	1,729
Northern	7.5	3.0	659	7.0	2.9	820	7.3	3.0	1,479
North-Western	4.2	1.3	765	6.6	2.0	1,012	5.4	1.7	1,777
Southern	5.1	2.3	990	6.6	3.2	1,186	5.9	2.8	2,176
Western	12.6	6.3	395	9.4	4.1	534	10.9	5.2	929
<b>Marital status</b>									
Never married	3.5	1.4	3,368	3.8	2.0	2,987	3.6	1.6	6,355
Married or living together	8.1	3.3	4,319	7.7	3.5	6,333	7.9	3.4	10,652
Divorced or separated	14.6	7.2	332	12.6	6.1	1,038	13.2	6.4	1,370
Widowed	20.2	12.1	60	14.3	6.0	536	15.0	6.8	596

**Education**

No education	5.4	0.7	246	8.0	4.1	715	7.2	3.1	961
Primary	7.0	3.1	3,142	8.9	4.1	5,184	8.1	3.7	8,326
Secondary	6.4	2.6	4,012	5.8	2.8	4,354	6.1	2.7	8,366
More than secondary	4.2	1.7	733	3.7	0.8	716	4.0	1.3	1,449

**Religion**

Catholic	6.4	2.7	1,614	7.5	3.3	1,968	6.9	3.0	3,582
Protestant	6.3	2.6	5,714	7.4	3.4	7,565	6.8	3.0	13,279
Muslim	2.3	(0.0)	40	13.9	(6.1)	38	6.9	2.5	78
Other	6.0	2.7	609	5.5	2.7	1,341	5.7	2.7	1,950
None	10.6	4.2	157	16.0	7.9	53	11.8	5.0	210

**Age**

15–19	2.1	0.6	1,811	3.3	1.6	2,120	2.7	1.1	3,931
20–24	3.9	1.8	1,344	5.5	2.9	2,045	4.7	2.4	3,389
25–29	5.8	3.0	1,053	7.7	4.0	1,619	6.8	3.5	2,672
30–34	8.2	3.9	1,003	7.2	3.3	1,458	7.7	3.5	2,461
35–39	7.1	3.4	836	9.5	4.0	1,160	8.3	3.7	1,996
40–44	11.9	5.3	751	11.9	5.8	989	11.9	5.5	1,740
45–49	11.9	5.3	560	11.7	5.0	619	11.8	5.2	1,179
50–54	9.8	2.4	444	12.1	3.6	584	11.0	3.0	1,028
55–59	12.4	2.6	340	10.2	4.2	379	11.3	3.4	719
Total 15–49	6.0	2.7	7,358	6.9	3.3	10,010	6.4	3.0	17,368
<b>Total 15–59</b>	6.3	2.7	8,142	7.2	3.4	10,973	6.8	3.0	19,115

Figures in parentheses are based on 25–49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

**Table 3.7.B Hepatitis B surface antigen prevalence by HIV status**

Prevalence of hepatitis B surface antigen among persons ages 0-59, by sex, HIV status, and age, ZAMPHIA 2016

Characteristic	Males		Females		Total	
	Percentage HBV positive	Number	Percentage HBV positive	Number	Percentage HBV positive	Number
<b>HIV positive</b>						
0-14	3.4	53	(9.2)	42	5.9	95
15-59	10.2	779	5.2	1,688	7.1	2,467
0-59	9.4	832	5.4	1,730	7.0	2,562
<b>HIV negative</b>						
0-14	1.3	3,948	1.1	3,972	1.2	7,920
15-59	6.9	7,363	3.9	9,285	5.4	16,648
0-59	4.1	11,311	2.5	13,257	3.3	24,568
<b>Total</b>						
0-14	1.4	4,001	1.2	4,014	1.3	8,015
15-59	7.2	8,142	4.1	10,973	5.6	19,115
0-59	4.4	12,143	2.7	14,987	3.5	27,130

Figures in parentheses are based on 25-49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

**Table 3.7.C Viral load suppression and severe immunosuppression**

Among HIV-positive persons ages 15-59 years, percentage with VLS (<1,000 copies/ml) and percentage with severe immunosuppression (CD4 count < 200 cells/ $\mu$ L) by ART status, by selected demographic characteristics, ZAMPHIA 2016

Characteristic	On ART ≥12 months		On ART <12 months		Not on ART		Total	On ART ≥12 months		On ART <12 months		Not on ART		Total
	Percentage VLS	Number	Percentage VLS	Number	Percentage VLS	Number		Percentage severe immuno-suppression	Number	Percentage severe immuno-suppression	Number	Percentage severe immuno-suppression	Number	
Sex														
Male	90.8	314	78.0	82	20.1	342	738	14.4	319	27.3	85	23.4	342	746
Female	90.2	804	89.5	166	18.4	655	1,625	7.9	817	10.1	169	13.7	667	1,653
Residence														
Urban	89.2	680	86.7	150	20.2	532	1,362	11.0	689	13.8	152	16.4	535	1,376
Rural	92.5	438	82.3	98	17.7	465	1,001	8.7	447	21.8	102	18.7	474	1,023
Age														
15–24	74.2	58	(61.6)	26	16.2	192	276	16.5	60	*	25	6.2	189	274
25–59	91.5	1060	87.8	222	19.8	805	2,087	9.8	1076	17.9	229	20.3	820	2,125
Total 15–59	90.4	1118	85.0	248	19.1	997	2,363	10.2	1136	16.9	254	17.5	1009	2,399

Figures in parentheses are based on 25-49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

# CONCLUSION

- Zambia has committed to have 90% of all PLHIV diagnosed, 90% of all people diagnosed receiving ART, and 90% of all people receiving ART virally suppressed by 2020. ZAMPHIA has estimated that among all HIV-positive persons ages 15-59, 66.0% knew they were HIV positive, which is still below the intended 2020 target.
- Zambia's HIV interventions have made considerable progress toward the last two UNAIDS' targets of 90-90-90: among adults who are aware of their HIV-positive status, 85% self-reported receiving ART, and 89.3% of adults receiving treatment were virally suppressed. However, viral load suppression continues to be a concern among younger populations.
- The declining national HIV incidence depicts large strides toward epidemic control; however, incidence among women remains high.
- Health care during pregnancy and delivery, and soon after delivery, is important for the survival and well-being of the mother and her child. ZAMPHIA 2016 obtained information on the extent to which women in Zambia attend at least one ANC visit for their most recent pregnancy and found that almost 100% of women 15-49 years of age do so. These findings are important to policy makers and program implementers in designing appropriate strategies and interventions to improve maternal and child health.
- With the goal of an AIDS-free generation by 2030, continued expansion of HIV testing and treatment, especially for men and young women, will play a central role.
- Beyond this report, further analysis will shed light on HIV behaviors, services, and treatment outcomes.



## REFERENCES

Joint United Nations Programme on HIV/AIDS (UNAIDS). An ambitious treatment target to help end the AIDS epidemic. UNAIDS / JC26 (English original, October 2014).

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# APPENDIX

Weighted counts for numbers of HIV-negative individuals (N), numbers of HIV-positive individuals (P), numbers tested on the LAg assay (Q), and numbers of recent HIV incidence (R) are provided for use in incidence calculations or UNAIDS Spectrum models. Incidence estimates were calculated using the following parameters: mean duration of recent infection = 130 days (95% CI: 118-142 days); proportion false recent = 0.00; time cutoff (T) = 1 year.

**Table APPENDIX.A Annual HIV incidence auxiliary data: N, P, Q, R**

Age	Males				Females				Total			
	Number HIV negative (N)	Number HIV positive (P)	Number tested on LAg assay (Q)	Number HIV recent (R)	Number HIV negative (N)	Number HIV positive (P)	Number tested on LAg assay (Q)	Number HIV recent (R)	Number HIV negative (N)	Number HIV positive (P)	Number tested on LAg assay (Q)	Number HIV recent (R)
15-24	3096.75	57.25	57.25	0.86	3929.57	236.43	236.43	15.09	7044.14	275.86	275.86	14.41
25-34	1890.73	165.27	165.27	1.68	2566.02	510.98	508.98	10.64	4485.48	647.52	645.74	11.44
35-49	1727.68	418.32	416.24	5.34	2032.10	734.90	731.12	7.68	3784.85	1128.15	1122.43	12.92
15-49	6743.71	612.29	610.37	7.52	8582.90	1427.10	1421.68	33.64	15394.54	1971.46	1964.43	38.49
15-59	7386.18	752.82	749.86	8.43	9368.61	1605.39	1599.90	34.02	16820.33	2292.67	2284.38	39.94

