

# Ethiopia Population-based HIV Impact Assessment

## EPHIA 2017-2018



FINAL REPORT  
AUGUST 2020



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# Ethiopia Population-based HIV Impact Assessment (EPHIA) 2017-2018

## EPHIA 2017-2018 COLLABORATING INSTITUTIONS

Ethiopian Public Health Institute (EPHI) in collaboration with the Federal HIV/AIDS Prevention and Control Office (FHAPCO)  
The United States President's Emergency Plan for AIDS Relief (PEPFAR)  
The United States Centers for Disease Control and Prevention (CDC)  
Central Statistics Agency, Ethiopia  
Ethiopian Public Health Association (EPHA)  
Westat  
ICAP at Columbia University

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## DESIGN AGENCY

Phoenix Design Aid A/S

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EPHIA Project: <http://www.eph.gov.et>  
The PHIA Project: <http://phia.icap.columbia.edu>

## CONTACT INFORMATION

Ethiopian Public Health Institute  
P.O. Box-1242  
Addis Ababa  
Ethiopia

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## GLOSSARY OF TERMS

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

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

**Adolescents:** This report defines young adolescents as children aged 10-14 years, and older adolescents as individuals aged 15-19 years. (Note: Older adolescents are included among young people [ages 15-24 years] and are also treated as part of the overall adult population for reporting purposes.)

**Adults:** Unless otherwise noted, for the purposes of this report, adults are defined as the population aged 15-64 years.

**Antiretroviral (ARV):** A type of medication used in the treatment of HIV.

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

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

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

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

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

**Head of Household:** The person who is recognized within the household as being the head and is aged 18 years and older or is considered an emancipated minor (less than the age of 18 years who is married or is free from any legally competent representative as defined by law in Ethiopia).

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

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

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

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

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

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

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

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

**Prevention of Mother-To-Child-Transmission (PMTCT) of HIV:** Activities to prevent an HIV-positive woman passing HIV to her baby during pregnancy, labor, delivery, or while breastfeeding. The World Health Organization (WHO) recommends effective PMTCT to include a four-fold approach: (1) primary prevention of HIV infection among women of childbearing age; (2) preventing unintended pregnancies among women living with HIV; (3) preventing HIV transmission from women living with HIV to their infants; and (4) providing appropriate treatment, care, and support to mothers living with HIV, their children, and families.

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

**Syphilis:** Syphilis is a curable STI caused by a bacterium, *Treponema pallidum*. Syphilis can be transmitted to the fetus during pregnancy or to the infant during delivery.

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

**Urban (Large and Small):** Urban areas include all geographic areas classified as urban by the Ethiopia's 2007 National Population and Housing Census. According to the census, urban referred to all capitals of regions, zones, and woredas (an administrative unit similar to a district), and it also included localities with urban kebeles (kebeles are similar to wards) where inhabitants are primarily engaged in non-agricultural activities. A large urban area was defined as having a population of more than 50,000 residents, while a small urban area was defined as having a population of 50,000 or less.

**Young Adults:** Unless otherwise noted, this report defines young adults as individuals aged 20-24 years.

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

## LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome	PEPFAR	U.S. President's Emergency Plan for AIDS Relief
ANC	Antenatal Care	PFR	Percentage False Recent
ART	Antiretroviral Therapy	PHIA	Population-based HIV Impact Assessment
ARV	Antiretroviral	PMTCT	Prevention of Mother-to-Child Transmission
CDC	U.S. Centers for Disease Control and Prevention	POC	Point of Care
CD4	CD4+ T-cell	QA	Quality Assurance
CI	Confidence Interval	QC	Quality Control
DBS	Dried Blood Spot	RR	Response Rate
EA	Enumeration Area	RRC	Results Returning Coordinator
EID	Early Infant Diagnosis	SMS	Short Message Service
EPHA	Ethiopian Public Health Association	STI	Sexually Transmitted Infection
EPHI	Ethiopian Public Health Institute	TB	Tuberculosis
EIA	Enzyme Immunoassay	TWG	Technical Working Group
EPHIA	Ethiopia Population-based HIV Impact Assessment	UNAIDS	Joint United Nations Programme on HIV and AIDS
FMOH	Federal Ministry of Health	VL	Viral Load
HBTC	Home-Based Testing and Counseling	VLS	Viral Load Suppression
HBV	Hepatitis B Virus	VMMC	Voluntary Medical Male Circumcision
HIV	Human Immunodeficiency Virus	WHO	World Health Organization
HPV	Human Papillomavirus		
ID	Identification Number		
IPV	Intimate Partner Violence		
IQR	Interquartile Range		
LA <sub>g</sub>	Limiting Antigen		
mL	Milliliter		
μL	Microliter		
MDRI	Mean Duration of Recent Infection		
MTCT	Mother-to-Child Transmission		
NNRTIs	Non-Nucleoside Reverse Transcriptase Inhibitors		
NRTI	Nucleoside Reverse Transcriptase Inhibitors		
OD <sub>n</sub>	(normalized) Optical Density		
PCR	Polymerase Chain Reaction		



## FOREWORD

Despite historic progress responding to the epidemic, HIV has remained an issue of public health concern in Ethiopia—particularly in urban areas of the country. According to the 2016 Ethiopia Demographic and Health Survey, the estimated national HIV prevalence rate among adults (15-49 years) was 0.9%, but the prevalence varied by sex, age, geography, and socio-economic status. Most notably, HIV prevalence was found to be markedly higher in urban areas (2.9%) than in rural areas (0.4%).<sup>1</sup> Despite our persistent efforts to halt the epidemic, HIV transmission appeared to continue in the country, particularly among the urban population.

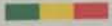
Consequently, our country implemented a public health approach to service delivery, which, in recent years, has included the rapid expansion in the number of facilities providing antiretroviral (ARV) therapy (ART). We have embraced the Joint United Nations Programme on HIV and AIDS (UNAIDS) 90-90-90 targets, which, in addition to improving health outcomes among people living with HIV, should lead to an increase in viral load suppression (VLS) among the HIV-positive population. It was anticipated that our service delivery public health approach would, in turn, reduce HIV incidence in Ethiopia and move the country closer to control of the HIV epidemic. Nevertheless, we needed evidence to measure our progress and to provide high-quality data on VLS, HIV prevalence, risk behaviors, and morbidity—particularly in urban areas of the country—to support our program management decisions and policy formulation.

It is therefore, with great pleasure, that we present the results from the Ethiopia Population-based HIV Impact Assessment (EPHIA), a household-based national survey in urban Ethiopia, conducted between October 2017 and April 2018. EPHIA offered home-based testing and counseling (HBTC) with return of results and collected information about uptake of HIV care and treatment services. This survey was the first in Ethiopia to measure HIV incidence, VLS prevalence, pediatric HIV prevalence, CD4 count distribution, presence of ARV drugs in blood, and transmitted HIV drug resistance among the urban population.

EPHIA was led by the government of Ethiopia through the Ethiopian Public Health Institute (EPHI) with technical assistance from the United States Centers for Disease Control and Prevention (CDC). The survey was implemented by ICAP at Columbia University in collaboration with local partners, including Federal HIV/AIDS Prevention and Control Office (FHAPCO), the Central Statistical Agency, and the Ethiopian Public Health Association (EPHA).

While HIV incidence is low, we need to bring it to zero. The evidence provided by EPHIA suggests some of the key areas where our efforts should be focused: There is a major gap in diagnosis among young people and adult men. There is even a failure to consistently test for HIV in tuberculosis (TB) diagnosis or treatment clinics, where it is the national policy to test anyone not already aware of their HIV-positive status. We also need to develop interventions to support adherence and improve rates of VLS among young people. In addition, two-thirds of sexually active adults continue to practice unprotected sex with non-marital, non-cohabitating partners—and the uptake of medical male circumcision remains too low in some regions of the country.

<sup>1</sup>Central Statistical Agency (CSA) [Ethiopia] and ICF. 2018. Ethiopia Demographic and Health Survey 2016: HIV Report. Addis Ababa, Ethiopia, and Rockville, Maryland, USA: CSA and ICF; 2018.



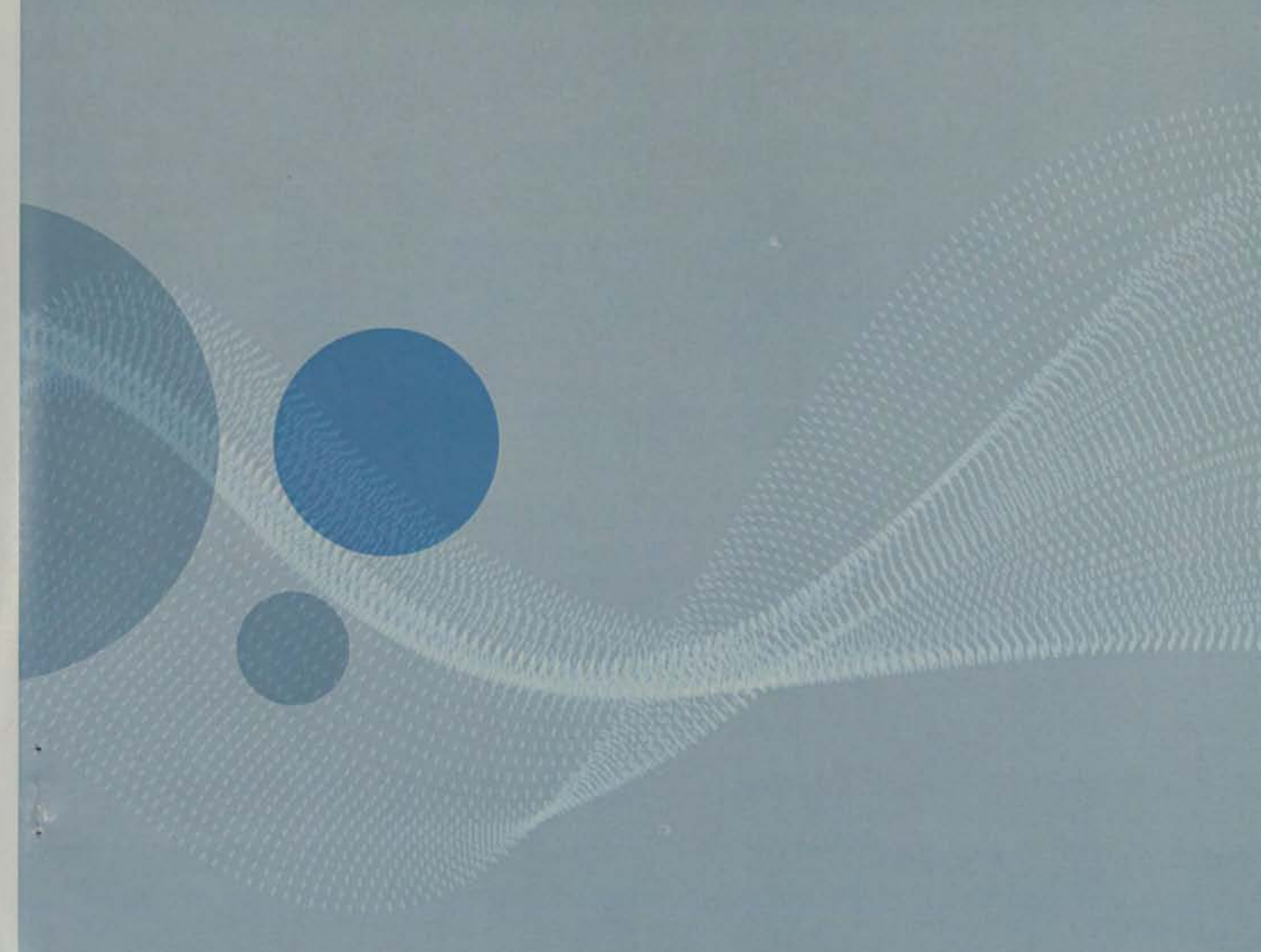
## FOREWORD *(Continued)*

Finally, we need to scale up interventions to improve the health and well-being of people living with HIV—including fostering an environment where they feel it is safe to disclose their HIV-positive status.

It is our hope that the biologic and behavioral data from EPHIA will be used by program planners to tailor interventions to these underserved populations—and improve the effectiveness of our service delivery models.

We would like to acknowledge the efforts of the national and international organizations in the planning and implementation of the survey and in writing this report. Most of all, we would like to thank our dedicated field staff and all the participants who shared their time and data for the benefit of our nation.

**Ebba Abate (Dr.)**  
Director General  
Ethiopian Public Health Institute

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# EXECUTIVE SUMMARY

## ANNUAL HIV INCIDENCE AND HIV PREVALENCE

- In urban Ethiopia, based upon the ARV-adjusted recent infection algorithm, the annual HIV incidence was 0.05% (corresponding to approximately 6,000 new cases) among adults in 2017-2018.
- In urban Ethiopia, HIV prevalence was 3.0% among adults in 2017-2018, which corresponds to approximately 384,000 persons living with HIV. HIV prevalence was the highest (14.7%) among widowed adults and the lowest (1.0%) among those who had never married. HIV prevalence among women was significantly higher than among men at ages 25-29, 30-34, and 35-39 years. HIV prevalence was 0.9% in older adolescents (those aged 15-19 years) (1.0% in boys, 0.7% in girls) and 0.6% in young adults (those aged 20-24 years) (0.3% in young men, 0.9% in young women). This corresponds to approximately 32,000 HIV-positive young people (older adolescents and young adults aged 15-24 years) in urban Ethiopia. Prevalence of HIV infection among children in urban Ethiopia was 0.3%, corresponding to approximately 19,000 HIV-positive children in urban Ethiopia. The burden of adult HIV infection varies across regions in urban areas. HIV prevalence among adults ranged from 0.8% in Somali to 5.7% in Gambella.
- In urban Ethiopia, 5.1% of the households had at least one HIV-positive member (4.6% in small [population ≤50,000 individuals] and 5.5% in large [population >50,000 individuals] urban areas).
- In urban Ethiopia, 4.2% of the households are headed by an HIV-positive person (5.8% of the female-headed and 2.3% of the male-headed households).

## HIV TESTING

- In Ethiopia, 69.8% of the urban adult population had ever tested for HIV and received their results (73.0% of women and 66.5% of men), based upon self-report.
- In Ethiopia, 23.4% of the overall urban adult population reported that they were tested for HIV and received their results in the 12 months preceding the survey (26.7% of women and 20.0% of men).
- Among only the adults who tested HIV positive in EPHIA, 90.6% reported ever testing for HIV and receiving their results (84.8% among men and 93.2% among women), while 19.0% were tested and received their results in 12 months preceding the survey.
- Only 28.9% of older adolescent boys reported ever testing for HIV and having received their results.

## VIRAL LOAD SUPPRESSION

- Among HIV-positive adults aged 15-49 years in urban Ethiopia, the proportion of adults achieving VLS (defined as HIV RNA less than 1,000 copies/mL) was 68.2%, while the proportion of adults aged 15-64 years with VLS was 70.1% (66.8% among men and 71.7% among women). The proportion of HIV-positive adults achieving VLS ranged from 48.2% in young people (defined as those aged 15-24 years in this survey) to 80.2% in those aged 45-54 years.

## 90-90-90 TARGETS

### Adults aged 15-64 years

- Based on self-report adjusted with ARV detection data, it is estimated that in urban Ethiopia:
  - **Diagnosed:**<sup>†</sup> 79.0% of HIV-positive adults (83.3% of women and 70.0% of men) were aware of their HIV-positive status.
  - **On treatment:** 97.1% of those aware of their HIV-positive status were receiving ART (96.4% of women and 98.9% of men).
  - **Viral load suppression:** 87.6% of those on treatment had suppressed viral loads (86.1% of women and 91.1% of men).

### Young people aged 15-24 years

- Based on self-report adjusted with ARV detection data, it is estimated that in urban Ethiopia:
  - **Diagnosed:**<sup>†</sup> 63.0% of HIV-positive young people were aware of their HIV-positive status.
  - **On treatment:** 100% of those who were aware of their HIV-positive status were receiving ART.
  - **Viral load suppression:** 74.3% of those on treatment had suppressed viral loads. (Note: Estimates for young people on treatment and with viral suppression are based on a small denominator [25-49] and should be interpreted with caution.)
- Among adults living with HIV aged 15-64 years in urban Ethiopia, 35.8% (45.6% of men and 31.1% of women) had immunosuppression with CD4+ T-cell count (CD4 count) less than 350 cells per microliter ( $\mu\text{L}$ ).
- Among adults who tested HIV positive in EPHIA, 22.0% had severe immunosuppression—a CD4 count less than 200 cells/ $\mu\text{L}$  (16.9% of men and 26.5% of women).
- Among women of child-bearing age (ages 15-49 years) who gave birth during the 12 months preceding the survey, 91.6% reported knowing their HIV status while they were pregnant.

## SEXUAL BEHAVIOR AND DEBUT

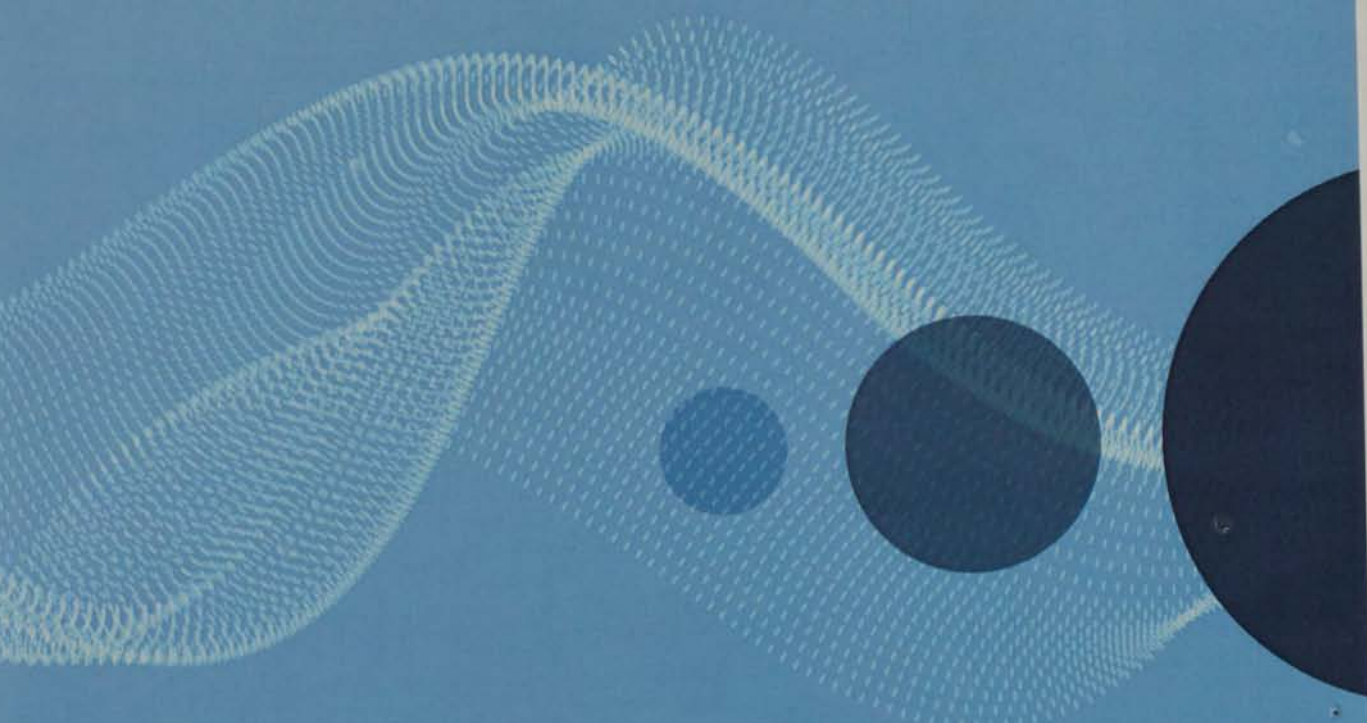
- Among adults who reported sexual debut before the age of 15 years, the estimated HIV prevalence was 6.8% (7.6% for women and 2.6% for men).
- Among young people living in urban Ethiopia, 2.7% reported having sex before the age of 15 years (2.2% among older adolescent boys and young men and 3.3% among older adolescent girls and young women). Among older adolescent girls aged 15-19 years, 2.1% reported sex before the age of 15 years, compared to 4.5% of those young women aged 20-24 years.
- Among sexually active young people, 36.6% (57.2% of older adolescent boys and young men, and 23.0% of older adolescent girls and young women) reported having sex with a non-marital, non-cohabitating partner in the 12 months before the survey. Older Ethiopians living in urban areas were less likely to report having sex with a non-marital, non-cohabitating partner in the 12 months before the survey (for example, this was reported by 4.5% [4.4% of men and 4.6% of women] of those aged 50-64 years).

<sup>†</sup>Due to inadequate number of observations in the sample, the cascade is not reported by gender.

- Among sexually active adults, 15.9% (18.5% of men and 13.0% of women) reported having sex with a non-marital or non-cohabitating partner in the 12 months preceding the survey—and among these, only 37.6% reported using a condom during their last sexual intercourse with such a non-marital or non-cohabitating partner.

## COINFECTIONS

- Based on self-report, 57.0% of adults in urban Ethiopia who had ever visited a clinic for TB diagnosis or treatment were tested for HIV during a TB-related clinic visit; however, 39.6% did not test for HIV during the visit and did not know their HIV status.
- Among adults living with HIV in urban Ethiopia who had ever visited a clinic for TB diagnosis and treatment, 63.3% were diagnosed with TB, and of these, 100% were treated for TB.
- Overall, the prevalence of ever having had syphilis was 13.4% among HIV-positive adults (17.4% among men and 11.5% among women). The overall prevalence of active syphilis among people living with HIV was 2.6% (5.0% among men and 1.4% among women).
- The prevalence of hepatitis B was 4.8% among adults who tested HIV positive (7.4% among men and 3.6% among women).
- Among women living with HIV aged 30-49 years in urban Ethiopia, the probability of having been screened for cervical cancer was 18.5% in large urban areas compared to 12.9% in small urban areas.



# 1. INTRODUCTION

## 1.1 BACKGROUND

Ethiopia is the second-most populous country in sub-Saharan Africa and has a significant burden of HIV. In the 2011 Ethiopia Demographic Health Survey, the estimated national HIV prevalence rate among adults (15-49 years) was 1.5%, but prevalence varied by sex, age, geography, and socio-economic status. Despite persistent efforts to halt the epidemic, HIV remains one of the health challenges in Ethiopia, and HIV transmission continues in the country, particularly among the urban population.

Consequently, Ethiopia has implemented a public health approach to service delivery, which includes a rapid expansion in the number of facilities providing antiretroviral (ARV) therapy (ART) in recent years. The country has endorsed the Joint United Nations Programme on HIV/AIDS (UNAIDS) 90-90-90 targets, which, in addition to improving health outcomes among people living with HIV, should lead to an increase in viral load (VL) suppression (VLS) among the HIV-positive population. It is anticipated that this will, in turn, reduce HIV incidence in Ethiopia and move the country closer to control of the HIV epidemic. However, further evidence was necessary to measure the country's progress; to provide high-quality data on HIV prevalence, viral suppression, risk behaviors, and morbidity, particularly in urban areas of the country; and to support future decision making and policy formation.

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

The Ethiopia Population-based HIV Impact Assessment (EPHIA) was led by the government of Ethiopia through the Ethiopian Public Health Institute (EPHI) with technical assistance from the United States Centers for Disease Control and Prevention (CDC). The survey was implemented by ICAP at Columbia University in collaboration with local partners, including Federal HIV/AIDS Prevention and Control Office (FHAPCO), the Central Statistical Agency, and the Ethiopian Public Health Association (EPHA).

## 1.2 OVERVIEW OF EPHIA 2017-2018

EPHIA, a household-based survey in Ethiopia's urban areas, was conducted between October 2017 and April 2018 to measure the status of Ethiopia's national HIV response. EPHIA offered home-based testing and counseling (HBTC) with return of results and collected information about uptake of HIV care and treatment services. This survey is the first in Ethiopia to measure HIV incidence, VLS prevalence, pediatric HIV prevalence, CD4 count distribution, presence of ARV drugs in blood, and transmitted HIV drug resistance. The survey also collected information on selected behaviors associated with HIV acquisition and transmission, and on common HIV comorbidities and other health conditions in urban Ethiopia.

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

With its focus on measuring key biological endpoints in a representative sample of the population in Ethiopia's urban areas, EPHIA provides direct estimates of HIV-infection risk and burden, the effectiveness and population-level impact of HIV-related prevention, care, and treatment interventions implemented in the country, and Ethiopia's progress toward the achievement of the UNAIDS 90-90-90 targets in the areas of the country most heavily affected by the HIV epidemic.

### 1.3 AIM

The goal of the survey was to examine the distribution of HIV disease, measure HIV-related risk behaviors, and assess the coverage and impact of HIV services on the population level using a representative sample of adults (defined as those aged 15-64 years) and children (defined as the population aged 0-14 years) in urban Ethiopia.

#### *Primary Objectives*

- To estimate the proportion of people living with HIV/AIDS with VLS in a household-based survey among adults 15-49 years of age in urban Ethiopia at the national and sub-national (i.e., regional) level.

#### *Secondary Objectives*

- To estimate national and sub-national (i.e., regional) HIV prevalence among adults (defined as those aged 15-64 years) in urban Ethiopia.
- To estimate HIV prevalence in urban children.
- To estimate HIV incidence among adults in urban Ethiopia.
- To estimate the proportion of people living with HIV with VLS among adults aged 50-64 years in urban Ethiopia.
- To describe the prevalence of HIV-related risk behaviors, knowledge, and attitudes in a household-based, representative urban sample of young adolescents aged 12-14 years and adults.
- To examine the correlation of demographic characteristics and HIV prevalence among adults and children.
- To determine the distribution of CD4 counts among HIV-positive adults and children.
- To estimate coverage of HIV-related services including HBTC, knowledge of HIV status, coverage of care and treatment services among adults and children.
- To estimate the prevalence of detectable ARVs in HIV-positive children and adults.
- To estimate the level of transmitted drug resistance in adults and children with evidence of recent HIV infection.
- To estimate the prevalence of syphilis among HIV-positive adults.
- To estimate the prevalence of hepatitis B coinfection among HIV-positive adults.

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## 2. SURVEY DESIGN, METHODS, AND RESPONSE RATES

EPHIA was a nationally representative, cross-sectional, population-based survey of households across urban Ethiopia. Its target population corresponded to urban adults (those aged 15-64 years) and children (those aged 0-14 years). The survey population excluded institutionalized children and adults.

## 2.1 SAMPLE FRAME AND DESIGN

EPHIA used a two-stage, stratified cluster sample design. The sampling frame was comprised of all urban households in the country based on the 2007 Population and Housing Census, which included 17,339 enumeration areas (EAs) containing 3,025,379 households and 11,862,821 persons at the time of the 2007 census, with an average number of households and persons per EA of 175 and 684, respectively (CSA, 2007). The first stage selected 393 EAs (clusters) using a probability proportional to size method. The 393 EAs stratified by nine regional states and two city administrations: Tigray, Afar, Amhara, Oromia, Somali, Benishangul Gumuz, SNNPR, Gambella, Harari, Addis Ababa, and Dire Dawa. During the second stage, a sample of households was randomly selected within each EA, or cluster, using an equal probability method, where the average number of households selected per cluster was 30 and the actual number of households selected per cluster ranged from 15 to 60, for a total number of 11,810 households (Table 2.1.A).

The sample size was calculated to provide a representative national estimate of VLS rate with 95% confidence interval (CI) of  $\pm 5\%$  and regional VLS rate with a 95% CI of  $\pm 20\%$  or less for adults aged 15-49 years residing in urban areas. One-half of the households were randomly selected for inclusion of children which was designed to provide a representative national estimate of pediatric HIV prevalence with a relative standard error less than or equal to 28%. The target sample size was 18,139 for adults aged 15-49 years, 1,777 for adults aged 50-64 years, and 4,930 for children.

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

Distribution of sampled enumeration areas and households, by region, EPHIA 2017-18						
Region	Enumeration Areas			Households		
	Small Urban Area ( $\leq 50,000$ )	Large Urban Area ( $> 50,000$ )	Total	Small Urban Area ( $\leq 50,000$ )	Large Urban Area ( $> 50,000$ )	Total
Tigray	11	15	26	322	457	779
Afar	17	0	17	513	0	513
Amhara	47	24	71	1,379	735	2,114
Oromia	63	29	92	1,932	827	2,759
Somali	9	8	17	253	260	513
Benishangul Gumuz	13	4	17	389	124	513
SNNPR	27	24	51	904	609	1,513
Gambella	8	9	17	255	258	513
Harari	0	16	16	0	498	498
Addis Ababa	0	52	52	0	1,582	1,582
Dire Dawa	0	17	17	0	513	513
<b>Total</b>	195	198	393	5,947	5,863	11,810

Unweighted figures

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

## 2.2 ELIGIBILITY CRITERIA, RECRUITMENT, AND CONSENT PROCEDURES

In EPHIA, the eligible survey population included individuals aged 0-64 years. The consent criteria are determined in each country, and it should be noted that the age categories are different than the adult, adolescent, and children population ages used for sampling and reporting purposes in this report. The consent criteria included:

- Women and men, ages 18-64 years, living in the selected households, and visitors of the same ages who slept in the household the night before the survey, who were willing and able to provide written consent.
- Adolescents aged 12-17 years living in the selected households, and visitors in the same age bracket who slept in the household the night before the survey, who were willing and able to provide written assent, and whose parents or guardians were willing and able to provide written permission for their participation.
- Children aged 0-11 years living in the selected households, and visitors of the same ages who slept in the household the night before the survey, whose parents or guardians were willing and able to provide written consent for their participation.

An electronic informed consent form was administered using a tablet (Appendix G). At each stage of the consent process, consent was indicated by signing or making a mark on the consent form on the tablet and on a printed copy, which was retained by the participant. A designated head of household provided written consent for household members to participate in the survey, after which individual members were rostered during a household interview. Adults and emancipated minors\* (ages 13-17) then provided written consent on the tablet for an interview and for participation in the biomarker component of the survey, including HBTC, with return of HIV-testing results and CD4 counts during the household visit. Receipt of test results was a requirement for participation in the biomarker component. If an individual did not want to receive his or her HIV test result, this was considered a refusal and the survey was concluded. Adults were also asked for written consent to store their blood samples in a repository to perform additional tests in the future.

Adolescents aged 12-17 years were asked for assent to the interview and biomarker components after permission was granted by their parents or guardians. Parents provided consent for biomarker testing for children below the age of assent (ages 0-11 years). In both cases, if a parent or guardian did not want to receive his or her child's HIV test results, this was considered a refusal and the survey was concluded.

Procedures with illiterate participants or participants with a sight disability involved the use of an impartial witness, chosen by the potential participant, who also signed or made a mark on the consent form on the tablet and the printed copy. If no witness could be identified, the potential participant or household (if the head of household was sight disabled or illiterate) was deemed ineligible.

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

\*An emancipated minor is an adolescent aged 13-17 years who is married or is free from any legally competent representative as defined by law in Ethiopia.

## 2.3 SURVEY IMPLEMENTATION

### *Training of Field and Laboratory Staff*

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

The training curriculum included:

- Scientific objectives of the survey
- Survey design and methods
- Completion of survey forms
- Data collection
- Staff responsibilities
- Recruitment of participants
- Informed consent procedures, including human subjects' protection, privacy, and confidentiality
- Blood collection for children and adults, including venipuncture and finger/heel stick
- HBTC
- CD4 count measurement using point-of-care (POC) Pima™ Analyzer
- Referral of participants to health and social services
- Management and transportation of blood specimens
- Biosafety
- Communication skills
- Protocol deviations, adverse events, and reporting of events

Laboratory staff were trained in specimen management, including sample processing, labeling, and quality assurance (QA).

Central laboratory staff were trained in VL measurement, early infant diagnosis, HIV confirmatory testing, and testing for recent HIV infection using the limiting antigen (LAg) avidity enzyme immunoassay (EIA).

### *Survey Staff*

Fieldwork started at the beginning of October 2017 and was completed in April 2018. Fieldwork was conducted by 31 locally hired field teams composed of a team leader, six nurse interviewers and two drivers, who were locally hired. Field teams included both male and female staff members who spoke the languages used in the areas to which they were deployed. A total of about 328 field staff (six field coordinators, 31 team leaders, 211 nurse interviewers [93 testers and 118 interviewers], six community-mobilization coordinators, and 74 drivers) participated in data collection. The field teams were supervised by 31 team leaders, six field coordinators and managed by central staff, who guided and oversaw data collection activities, performed quality checks, and provided technical support (Appendix D).

In addition, the laboratory staff was organized at different levels (central laboratory staff, regional field supervisors, onsite laboratory supervisors, satellite lab technicians, and satellite lab logisticians). Overall, 31 satellite laboratory technicians and five central lab technicians processed samples and performed additional procedures for HIV-1 VL, infant virological HIV testing, and quality control (QC) and QA. National and international monitors periodically conducted direct observation of data collection activities in the field and in the laboratories to provide technical support and ensure quality.

### *Community Sensitization and Mobilization*

Community mobilization was conducted prior to data collection to maximize community support and participation in the survey. The mobilization began before fieldwork commenced with a national launch meeting that included key national and

regional leaders, media, and other stakeholders. Community mobilization teams visited each EA prior to initiation of data collection and partnered with community mobilizers to meet key gatekeepers in the communities (chiefs, local government officials, religious and community leaders). The mobilization teams held community sensitization meetings, disseminated written informational materials such as brochures and posters, and held discussions with selected households and other community residents.

#### *Supervision*

Data-collection teams were continuously overseen by field-based supervisors as well as periodically monitored by national and international teams with representation from collaborating institutions. Monitoring teams visited field and laboratory sites at least monthly and provided direct supervision as well as verification of results by household revisits. Daily monitoring forms for household and individual outcome tracking were also reviewed by monitors for completeness. Field-based supervisors also supported teams by organizing supplies and transport of blood samples, coordinating community-mobilization efforts, providing technical troubleshooting, and checking the quality of household procedures and data collected.

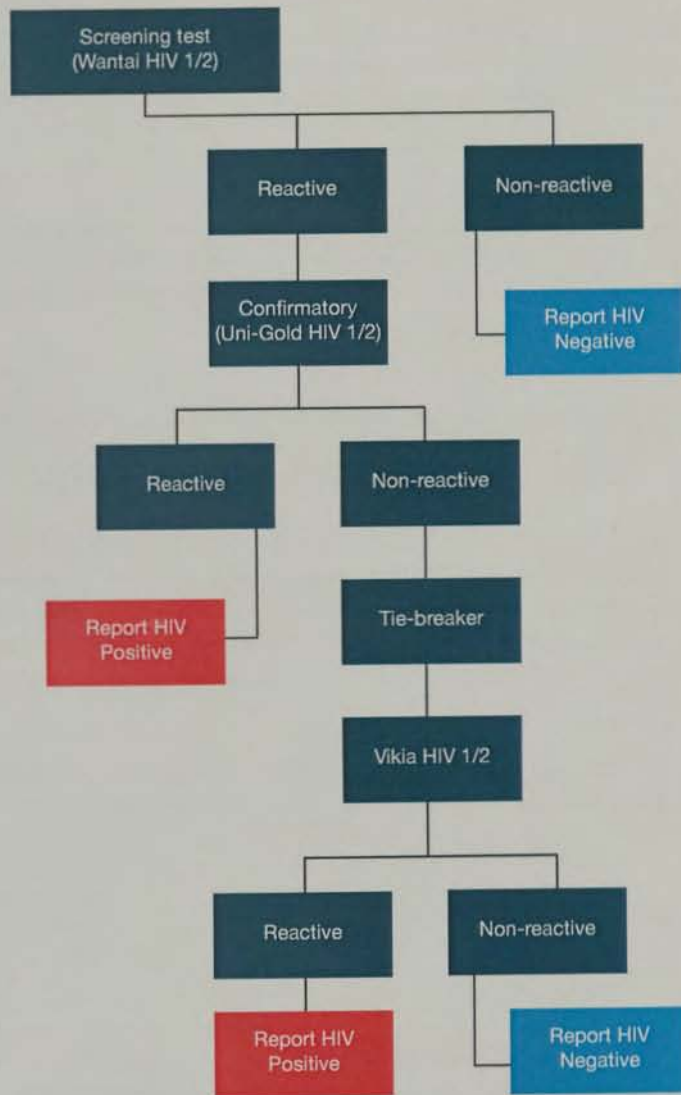
The national and international monitoring teams observed and assessed the quality of survey procedures, including adherence to protocol and standard operating procedures, and identified and responded to challenges with data collection. Regular debriefing sessions were held between field-based supervisors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

#### *Electronic monitoring system*

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

#### *Questionnaire Data Collection*

Questionnaire and field laboratory data were collected on mobile tablet devices using an application programmed in Open Data Kit (ODK), an open-source mobile data collection application. The household interview collected information on household residents, assets, economic support, recent deaths, and orphans and vulnerable children (see Appendix E). The adult interview was administered to participants aged 15 years and older and included modules on demographic characteristics, sexual and reproductive health, marriage, male circumcision, sexual activity, HIV/AIDS knowledge and attitudes, the HIV testing and treatment history, TB and other diseases, alcohol use, and gender norms (see Appendix F). Participants who self-reported their HIV-positive status were asked questions about their HIV care experience. Parents also answered questions about their children's (ages 0-14 years) health and participation in HBTC services as a part of the adult interview. The adolescent questionnaire, for children aged 12-14 years, contained a subset of questions from the adult questionnaire, including demographic characteristics, sexual activity, HIV-related risk behaviors, exposure to HIV prevention programs, and awareness of HIV-positive status. In each household, one woman among those aged 15-64 years was also randomly selected to answer questions about her experiences with violence. Participants of any age who reported being victims of violence and minors who reported being victims of sexual exploitation were provided with referrals to social services. Female participants were interviewed by female staff, and males by male staff, whenever possible. The questionnaire was administered in the five languages most commonly used in Ethiopia: Amharic, Oromiffa, Tigrigna, Afarigna, and Somaligna. Versions of the questionnaires in each language were reviewed and tested thoroughly for acceptability, feasibility, and flow of questions.



**Figure 2.4.A**  
Household-based  
HIV testing algorithm,  
EPHIA 2017-2018

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

For children less than the age of 18 months, only the screening test (Wantai) was performed in the field. If the test was reactive, HIV deoxyribonucleic acid (DNA) polymerase chain reaction (PCR) for virological testing of HIV infection was performed in the reference laboratory, as described below (Section 2.5).

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

#### *QC and QA for HIV testing*

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

#### *Hepatitis B Testing*

Hepatitis B virus (HBV) testing was performed using Determine HBsAg rapid HBV test (Abbott Molecular Inc., Chicago, Illinois, United States, formerly Alere) for all HIV-positive adults for HBV surface antigen. A reactive test result using Determine HBV test classified the participant as HBV positive while a HBV test non-reactive result classified the participant as HBV negative.

#### *Syphilis Testing*

In EPHIA, syphilis screening and confirmatory testing was done for all HIV-positive adults. The test (DPP Chembio Diagnostic System, INC., Medford, New York, United States) was used to differentiate active and past syphilis infection by nontreponemal and treponemal antibodies. Reactive for both non-treponemal and treponemal antibodies were classified as having active syphilis infection and referred for care with their HIV and CD4 results.

#### *CD4 T-Cell Count Measurement*

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

## 2.5 LABORATORY-BASED BIOMARKER TESTING

### *Satellite and Central Laboratories*

Twenty-one satellite laboratories for the survey were established in existing health facility laboratories. One central reference laboratory (National HIV Reference Laboratory, EPHI, Addis Ababa) was chosen for more specialized tests. At each satellite laboratory, trained laboratory technicians performed processing of whole blood specimens into plasma aliquots and DBS cards for storage at -20°C, testing for QA, and HIV confirmatory testing. For QA of the HIV rapid testing conducted in the field, the first 50 samples tested by each field tester and a random sample of 5.0% of specimens that tested HIV negative during HBTC were retested in the laboratory using the national HIV rapid-testing algorithm. All specimens that tested HIV positive during HBTC and those that had confirmed positive rapid test results during QA, underwent confirmatory testing using the Geenius HIV 1/2 Supplemental Assay (Bio-Rad, Hercules, California, United States). A positive Geenius result defined HIV-positive status for the survey. Central laboratory procedures included HIV VL testing, HIV DNA PCR for infant virological testing and for confirmation of status of those who self-reported an HIV-positive status but tested negative in HBTC, testing for recent HIV infections, ARV drug resistance testing and long-term storage of samples at -80°C.

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

#### *Viral Load Testing*

The HIV-1 VL (HIV RNA copies per mL) of confirmed HIV-positive participants was measured from plasma using the Roche (COBAS® AmpliPrep/COBAS® TaqMan® HIV-1 Test, Roche Diagnostics, Indianapolis, Indiana, United States) and from DBS using Abbott m2000 System (Abbott Molecular Inc., Chicago, Illinois, United States). Both systems consist of two separate instruments, the sample preparation (Ampli Prep and m2000sp, which carries out automated extraction, purification, and preparation of HIV-1 RNA), and the COBAS TaqMan-96 and m2000rt (which amplifies, detects, and measures the HIV-1 RNA load). In COBAS TaqMan-96, 1 mL of plasma protocol was used, while the open-mode protocol for the Abbott Real Time HIV-1 assay was used to measure VL from DBS samples from children and adults with insufficient volume of plasma.

Viral load results were returned by the result returning coordinator (RRC) within eight to 10 weeks to the health facility chosen by each HIV-positive participant. Participants were provided with a referral form (and, if they consented, were escorted to the health facility) during HBTC for subsequent retrieval of their results. Survey staff (RRC) also contacted each participant via mobile phones, informing them that their VL results were available at the chosen facility and further advising them to seek care and treatment.

#### *Infant HIV Virological Testing*

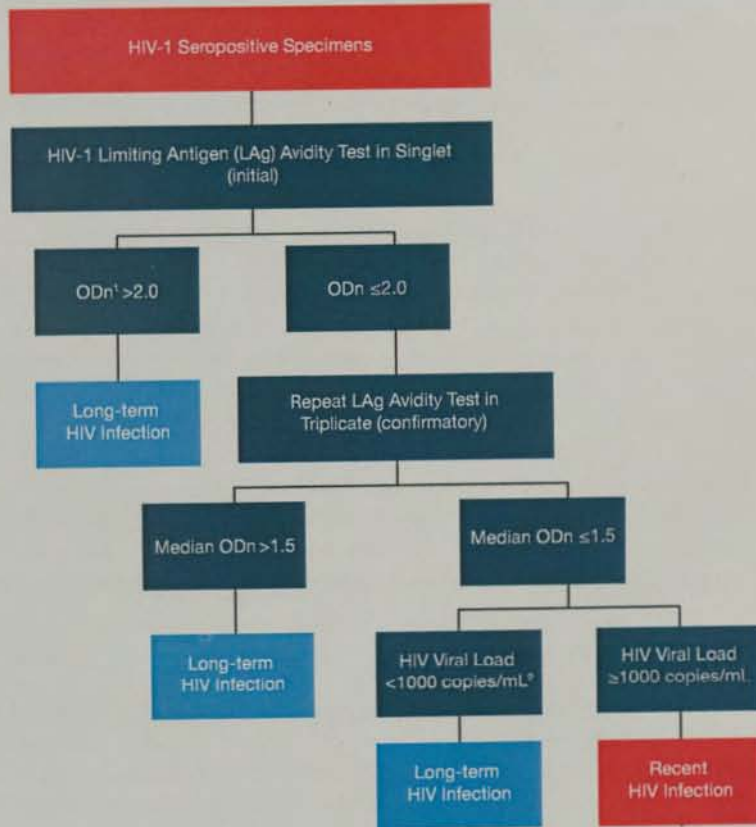
For infants younger than 18 months of age who screened positive for HIV during HBTC, virological testing was conducted via HIV DNA PCR using the Roche Taqman HIV-1 Qualitative Assay (COBAS® TaqMan® system, Roche Diagnostics, United States). Results were returned to a health facility selected by the child's parent or guardian within eight weeks, and RRC also contacted the parent or guardian via telephone to inform them that the child's results were available at the facility.

#### *HIV Recent Infection Testing Algorithm*

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

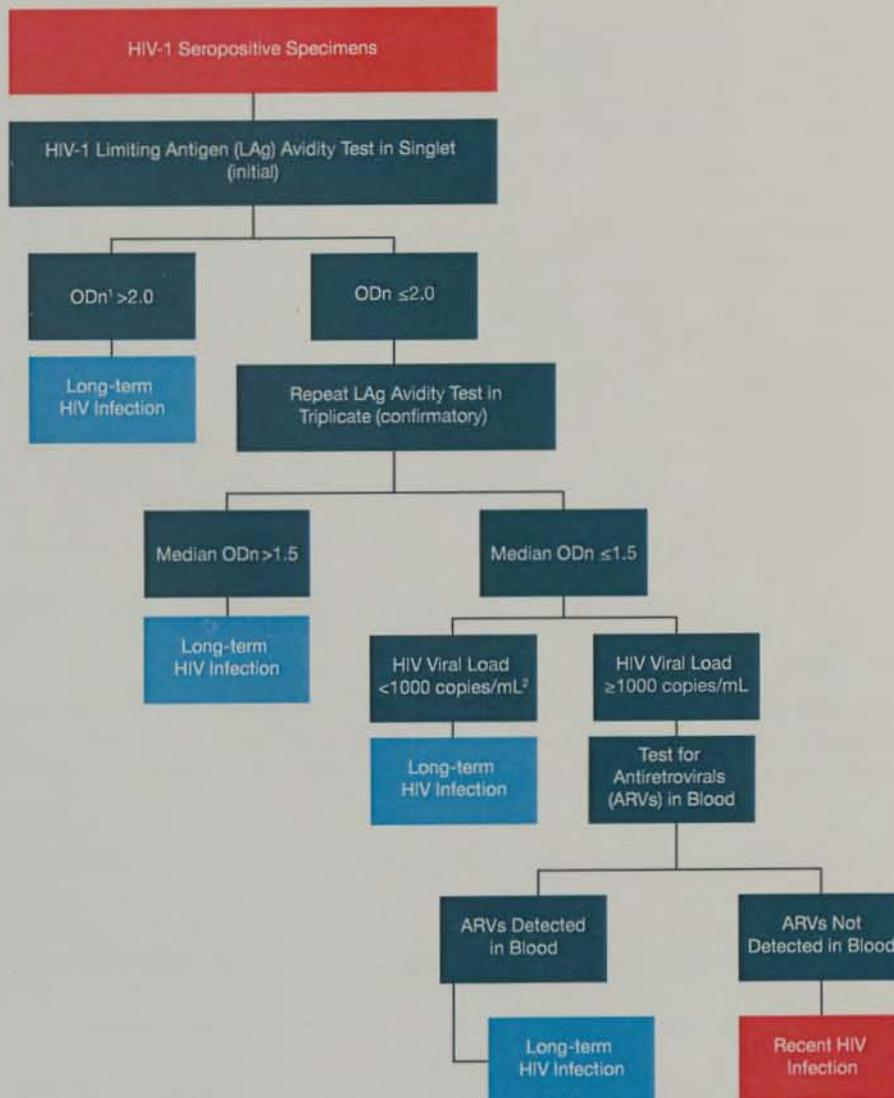
Specimens with median normalized optical density (ODn),  $\leq 1.5$  using LAg avidity testing were classified as potential recent infections and their VL results were assessed. Specimens with VL  $< 1,000$  copies/mL were classified as long-term infections, while those with VL  $\geq 1,000$  copies/mL were classified as recent infections (Figure 2.5.A).

**Figure 2.5.A**  
HIV-1 recent infection  
testing algorithm  
(LAg/VL algorithm),  
EPHIA 2017-2018



<sup>1</sup>ODn: normalized optical density; <sup>2</sup>mL: milliliter

In the ARV-adjusted algorithm, specimens with VL  $\geq 1,000$  copies/mL and with detectable ARVs were classified as long-term infections. Specimens with VL  $\geq 1,000$  copies/mL and without detectable ARVs were classified as recent infections (Figure 2.5.B). (Note: In EPHIA, one case was reclassified as recent because the participant reported having an initial positive HIV test and ART initiation within three months of the survey interview.)



**Figure 2.5.B**  
HIV-1 recent infection testing algorithm (LAg/VL/ARV algorithm), ages 18 months and older, EPHIA 2017-2018

<sup>1</sup>ODn: normalized optical density; <sup>2</sup>mL: milliliter

#### Detection of Antiretroviral Drug Resistance

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

Specimens were tested at EPHI's National HIV Laboratory, which is a World Health Organization (WHO) accredited laboratory for drug resistance testing.

### *Detection of Antiretrovirals*

Qualitative screening for detectable concentrations of ARVs was conducted on DBS specimens from all HIV-positive adults and children by means of high-resolution liquid chromatography coupled with tandem mass spectrometry. The method used for ARV detection was a modified version of the methodology described by Koal et al.<sup>1</sup> This qualitative assay was highly specific, as it separates the parent compound from the fragments, and highly sensitive, with a limit of detection of 0.02 µg/mL for each drug, and a signal-to-noise ratio of at least 5:1 for all drugs. As detection of all ARVs in use at the time of the survey was cost-prohibitive, three ARVs, efavirenz, lopinavir, and tenofovir, were selected as markers for the most commonly prescribed first- and second-line regimens. Samples from participants who had VLS and/or reported being on ART, but had no evidence of the first three compounds, were tested for nevirapine. These ARVs were also selected based on their relatively long half-lives, allowing for a longer period of detection following intake.

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

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

## 2.6 DATA PROCESSING AND ANALYSIS

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

All results presented in the report are based on weighted estimates unless otherwise noted. Analysis weights account for sample selection probabilities and adjusted for nonresponse and non-coverage. Nonresponse adjusted weights were calculated for households, individual interviews, and individual blood draws in a hierarchical form. Adjustment for nonresponse for initial individual and blood-level weights was based on the development of weighting adjustment cells defined by a combination of variables that are potential predictors of response and HIV status. The nonresponse adjustment cells were constructed using chi-square automatic interaction detection, or Chi-square Automatic Interaction Detector (CHAID), algorithm. The cells were defined based on data from the household interview for the adjustment of individual-level weights, and from both the household and individual interviews for the adjustment of blood sample-level weights. Post-stratification adjustments were implemented to compensate for non-coverage in the sampling process. This final adjustment calibrated the nonresponse-adjusted individual and blood weights to make the sum of each set of weights conform to national population totals by sex and five-year age groups. For a detailed explanation of the sampling and weighting processes, see the Sampling and Weighting Technical Report, available on the PHIA website at <https://phia-data.icap.columbia.edu/>.

Descriptive analyses of RR, characteristics of respondents, HIV prevalence, CD4 count distribution, HIV testing, self-reported HIV status, self-reported ART, VLS, prevention of mother-to-child transmission (PMTCT) indicators, and sexual behavior were conducted using SAS 9.4. (Note: Unless otherwise noted, claims of statistically significant comparisons in the report were based upon non-overlapping 95% CIs [the CIs shown in the narrative are in the final release data set available on the <https://phia.icap.columbia.edu/>].)

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

## 2.7 RESPONSE RATES

Household RRs were calculated using the American Association for Public Opinion Research Response Rate 4 method<sup>2</sup> as the number of complete and incomplete household interviews among all eligible households and those estimated to be eligible among those with unknown eligibility (households not located, not attempted, or unreachable). Vacant and destroyed households, nonresidential units, and household units with no eligible respondents were considered not eligible and excluded from the calculation.

Individual interview RRs were calculated as the number of individuals who were interviewed divided by the number of individuals eligible to participate in the survey. Blood draw RRs for adults were calculated as the number of adults who provided blood divided by the number of adults who were interviewed. Blood draw RRs for children were calculated as the number of children who provided blood divided by the number of children eligible to participate in the survey.

Of the 11,810 selected households, 11,581 and 10,529 were occupied and interviewed, respectively. The overall household RR (unweighted) was 90.9. After adjusting for differential sampling probabilities and nonresponse, the overall weighted household RR was 91.4 (Table 2.7.A).

**Table 2.7.A Household response rates**

Number of households selected, occupied, and interviewed and household response rates (unweighted and weighted), by urban area size and region, EPHIA 2017-18														
Result	Urban Area Size		Region										Total	
	Small (<50,000)	Large (>50,000)	Tigray	Afar	Amhara	Oromia	Somali	Benishangul Gumuz	SNNPR	Gambella	Harari	Addis Ababa		Dire Dawa
<b>Household interviews</b>														
Households selected	5,947	5,863	779	513	2,114	2,759	513	513	1,513	513	498	1,582	513	11,810
Households occupied	5,852	5,729	770	503	2,048	2,728	500	504	1,508	505	490	1,522	503	11,581
Households interviewed	5,198	5,331	734	466	1,871	2,471	453	435	1,360	405	445	1,431	458	10,529
Household response rate <sup>1</sup> (unweighted)	88.8	93.0	95.2	92.6	91.4	90.5	90.6	86.3	90.2	80.2	90.6	94.0	91.1	90.9
Household response rate <sup>2</sup> (weighted)	89.1	93.8	95.2	92.8	91.3	90.8	90.5	86.5	90.4	81.0	90.6	92.7	91.1	91.4

<sup>1</sup>Household response rate was calculated using the American Association for Public Opinion Research (AAPOR) Response Rate 4 (RR4) method: [http://www.aapor.org/AAPOR\\_Main/media/publications/Standard-Definitions20169theditionfinal.pdf](http://www.aapor.org/AAPOR_Main/media/publications/Standard-Definitions20169theditionfinal.pdf)  
<sup>2</sup>Weighted figures.

A total of 21,538 adults (8,920 men and 12,618 women) were eligible to participate in the survey. A total of 20,170 adults participated in the individual interview: interview RRs were 89.6 for men and 96.1 for women. Among those adults who were interviewed, 93.6 of men and 95.2 of women also had their blood drawn (Table 2.7.B).

In EPHIA, children in half of the selected households were eligible for blood draw. Of the eligible children aged 0-11 years, 83.9 of boys and 83.7 of girls had their blood drawn. Of the eligible young adolescents aged 12-14 years, 95.9 of boys and 95.3 of girls had their blood drawn (Table 2.7.B).

**Table 2.7.B Interview and blood draws response rate**

Result	Urban Area Size					
	Small (≤50,000)		Large (>50,000)		Total	
	Male	Female	Male	Female	Male	Female
<b>Eligible individuals, ages 0-11 years</b>						
Number of eligible individuals	1,184	1,227	1,038	1,013	2,222	2,240
Blood draw response rate (unweighted)	85.3	85.2	83.0	84.2	84.2	84.7
Blood draw response rate (weighted)	84.4	84.2	83.2	83.0	83.9	83.7
<b>Eligible individuals, ages 12-14 years</b>						
Number of eligible individuals	267	304	215	288	482	592
Interview response rate (unweighted)	93.3	93.1	94.4	91.7	93.8	92.4
Interview response rate (weighted)	92.8	92.7	92.3	93.0	92.6	92.8
Blood draw response rate (unweighted)	95.6	95.8	96.6	96.2	96.0	96.0
Blood draw response rate (weighted)	95.5	94.0	96.4	96.7	95.9	95.3
<b>Eligible individuals, ages 15-24 years</b>						
Number of eligible individuals	1,706	2,467	1,535	2,759	3,241	5,226
Interview response rate (unweighted)	91.0	95.9	88.4	95.6	89.8	95.8
Interview response rate (weighted)	90.8	95.6	88.2	95.5	89.6	95.5
Blood draw response rate (unweighted)	95.5	96.0	94.0	95.4	94.8	95.7
Blood draw response rate (weighted)	94.6	95.9	92.9	95.2	93.8	95.5
<b>Eligible individuals, ages 15-49 years</b>						
Number of eligible individuals	4,008	5,294	3,974	6,167	7,982	11,461
Interview response rate (unweighted)	91.8	96.3	87.2	96.2	89.5	96.2
Interview response rate (weighted)	91.7	96.0	86.9	96.0	89.4	96.0
Blood draw response rate (unweighted)	94.8	95.5	93.0	95.1	94.0	95.3
Blood draw response rate (weighted)	94.4	95.2	92.4	94.8	93.5	95.0

Table 2.7.B Interview and blood draws response rates (continued)

Result	Urban Area Size					
	Small ( $\leq 50,000$ )		Large ( $> 50,000$ )		Total	
	Male	Female	Male	Female	Male	Female
<b>Eligible individuals, ages 50-64 years</b>						
Number of eligible individuals	440	511	498	646	938	1,157
Interview response rate (unweighted)	94.1	98.2	90.8	96.9	92.3	97.5
Interview response rate (weighted)	93.7	98.0	89.7	96.4	91.7	97.2
Blood draw response rate (unweighted)	95.7	97.4	94.5	95.5	95.0	96.4
Blood draw response rate (weighted)	95.1	97.5	93.7	95.8	94.4	96.6
<b>Eligible individuals, ages 15-64 years</b>						
Number of eligible individuals	4,448	5,805	4,472	6,813	8,920	12,618
Interview response rate (unweighted)	92.0	96.5	87.6	96.2	89.8	96.4
Interview response rate (weighted)	91.9	96.2	87.2	96.0	89.6	96.1
Blood draw response rate (unweighted)	94.9	95.7	93.2	95.1	94.1	95.4
Blood draw response rate (weighted)	94.5	95.5	92.6	94.9	93.6	95.2

<sup>1</sup>Interview response rate = number of individuals interviewed/number of eligible individuals  
<sup>2</sup>Blood draw response rate = number of individuals who provided blood/number of individuals interviewed

## 2.8 REFERENCES

1. Koal T, Burhenne H, Römmling R, Svoboda M, Resch K, Kaever V. Quantification of antiretroviral drugs in dried blood spot samples by means of liquid chromatography/tandem mass spectrometry. *Rapid Commun Mass Spectrom*. 2005;19(21):2995-3001.
2. The American Association for Public Opinion Research (AAPOR). *Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys*. 9th edition. AAPOR; 2016. [https://www.aapor.org/AAPOR\\_Main/media/publications/Standard-Definitions20169theditionfinal.pdf](https://www.aapor.org/AAPOR_Main/media/publications/Standard-Definitions20169theditionfinal.pdf). Accessed on August 8, 2019.



# 3. SURVEY HOUSEHOLD CHARACTERISTICS

## KEY FINDINGS

- In urban Ethiopia, 5.1% of the households had at least one HIV-positive member (4.6% in small [population  $\leq 50,000$  individuals] and 5.5% in large [population  $> 50,000$  individuals] urban areas).
- In urban Ethiopia, 4.2% of the households are headed by an HIV-positive person (5.8% of the female-headed and 2.3% of the male-headed households).

### 3.2 BACKGROUND

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

### 3.3 HOUSEHOLD COMPOSITION

Overall, while the majority of the households (53.2%) were female-headed, a large percentage of the households (46.8%) were headed by men. This distribution was different in large urban areas (>50,000) and small urban areas ( $\leq$ 50,000): 41.7% of households in large urban areas were male-headed and 58.3% were female-headed, while 51.8% of households in small urban areas were male-headed and 48.2% were female-headed. The median household size was 3 members (interquartile range [IQR] 2-5) and the median number of minors 18 years of age and under in households was 1 (IQR 0-2) (Table 3.3.A). Children (defined as those aged 0-14 years) comprised 32.8% (16.8% girls and 16.1% boys) of the de facto household population, while adults (defined as those aged 15-64 years) constituted 63.2% (37.1% women and 26.1% men). Adults 65 years of age and older constituted 3.9% of the household population (2.1% women and 1.8% men) (Figure 3.3A; Table 3.3.C).

Overall, the de facto population in small urban areas (population  $\leq$ 50,000 individuals) was younger than that in large urban areas (population >50,000 individuals): 35.4% of the population in small urban areas were children compared with 30.2% of the population in large urban areas. In large urban areas, the distribution by age differed considerably between sexes, with 63.1% of female population aged 15-49 years compared to 54.0% of male population in this age group. In contrast, in small urban areas 57.4% of women were in the 15-49 age group compared to 52.4% of men in that age group.

In large urban areas, 30.2% of the population were between 0-14 years of age, compared to small urban areas where 35.4% of the population were in that age group (Figure 3.3.B; Table 3.3.B).

**Table 3.3.A Household composition**

Percent distribution of households by sex of head of household; median (quartile 1, quartile 3 [Q1, Q3]) size of household and median (Q1, Q3) number of minors under 18 years of age, by urban area size, EPHIA 2017-18						
Characteristic	Urban Area Size				Total	
	Small ( $\leq$ 50,000)		Large (>50,000)		Percent	Number
	Percent	Number	Percent	Number		
<b>Head of household</b>						
Male	51.8	2,612	41.7	2,189	46.8	4,801
Female	48.2	2,586	58.3	3,142	53.2	5,728
Total	100.0	5,198	100.0	5,331	100.0	10,529
Characteristic	Urban Area Size				Total	
	Small ( $\leq$ 50,000)		Large (>50,000)		Median	Q1, Q3
	Median	Q1, Q3	Median	Q1, Q3		
Size of households	3	(2, 5)	3	(2, 5)	3	(2, 5)
Number of children under 18 years of age	1	(0, 2)	1	(0, 2)	1	(0, 2)

Table 3.3.B Household population by age, sex, and residence

Percent distribution of the household population, by sex, age, and urban area size, EPHIA 2017-18												
Age	Small Urban Area (≤50,000)						Large Urban Area (>50,000)					
	Male		Female		Total		Male		Female		Total	
	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number
0-4	13.9	1,118	11.2	1,039	12.4	2,157	13.1	931	9.1	875	10.8	1,806
5-14	24.3	1,904	21.8	2,018	23.0	3,922	21.6	1,585	17.8	1,715	19.4	3,300
15-49	52.4	4,011	57.4	5,294	55.1	9,305	54.0	3,979	63.1	6,169	59.2	10,148
≥50	9.4	705	9.6	853	9.5	1,558	11.4	829	10.0	1,068	10.6	1,897
Total	100.0	7,738	100.0	9,204	100.0	16,942	100.0	7,324	100.0	9,827	100.0	17,151

Weighted figures.

Figure 3.3.A  
Distribution of the de facto population by sex and age, EPHIA 2017-2018

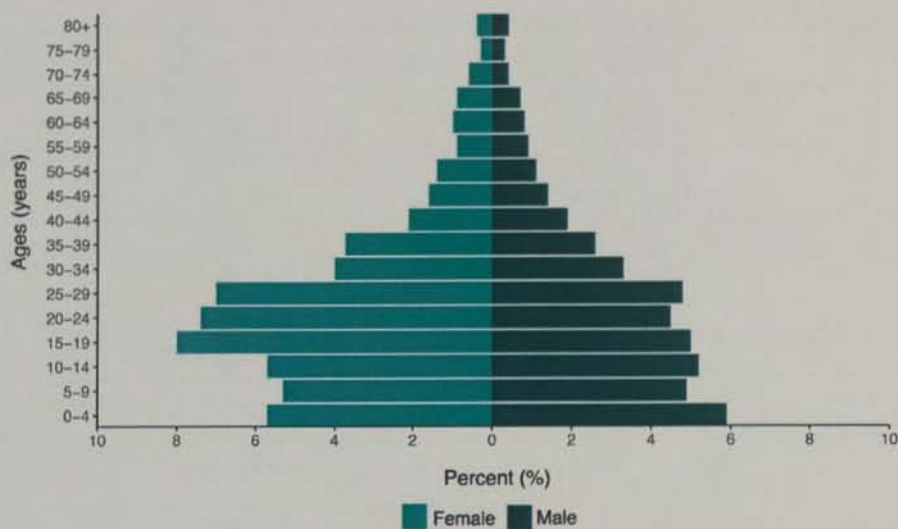


Table 3.3.C Distribution of the de facto household population, by 5-year age group, sex

Percent distribution of the de facto household population, by five-year age groups and sex, EPPIA 2017-18						
Age	Male		Female		Total	
	Percent	Number	Percent	Number	Percent	Number
0-4	5.9	2,049	5.7	1,914	11.6	3,963
5-9	4.9	1,720	5.3	1,810	10.3	3,530
10-14	5.2	1,769	5.7	1,923	10.9	3,692
15-19	5.0	1,712	8.0	2,675	13.0	4,387
20-24	4.5	1,532	7.4	2,551	11.9	4,083
25-29	4.8	1,647	7.0	2,369	11.8	4,016
30-34	3.3	1,106	4.0	1,364	7.3	2,470
35-39	2.6	874	3.7	1,265	6.3	2,139
40-44	1.9	644	2.1	729	3.9	1,373
45-49	1.4	475	1.6	510	3.0	985
50-54	1.1	385	1.4	479	2.5	864
55-59	0.9	306	0.9	318	1.8	624
60-64	0.8	247	1.0	360	1.8	607
65-69	0.7	219	0.9	305	1.6	524
70-74	0.4	155	0.6	211	1.1	366
75-79	0.3	102	0.3	109	0.6	211
≥80	0.4	120	0.4	139	0.7	259
Total	44.0	15,062	56.0	19,031	100.0	34,093

Weighted figures.

**Figure 3.3.B**  
Household population  
by age, sex, and  
residence, EPHIA  
2017-2018



<sup>1</sup>Small Urban Areas are urban areas with populations  $\leq 50,000$  individuals.

<sup>2</sup>Large Urban Areas are urban areas with populations  $>50,000$  individuals.

### 3.4 PREVALENCE OF HIV-AFFECTED HOUSEHOLDS

The prevalence and composition of households impacted by HIV, which are households with one or more HIV-positive members, are described by the tables and figures below. (Note: HIV-status of the household members was determined by the HIV test performed in the survey.)

**Table 3.4.A Prevalence of HIV-affected households**

Percentage of households with at least one HIV-positive household member, by urban area size, EPHIA 2017-18		
Urban Area Size	Percent	Number
Small ( $\leq 50,000$ )	4.6	4,848
Large ( $>50,000$ )	5.5	4,954
Total	5.1	9,802

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

Among households with at least one HIV-positive household member, percent distribution of households by number of HIV-positive household members, by urban area size, EPHIA 2017-18

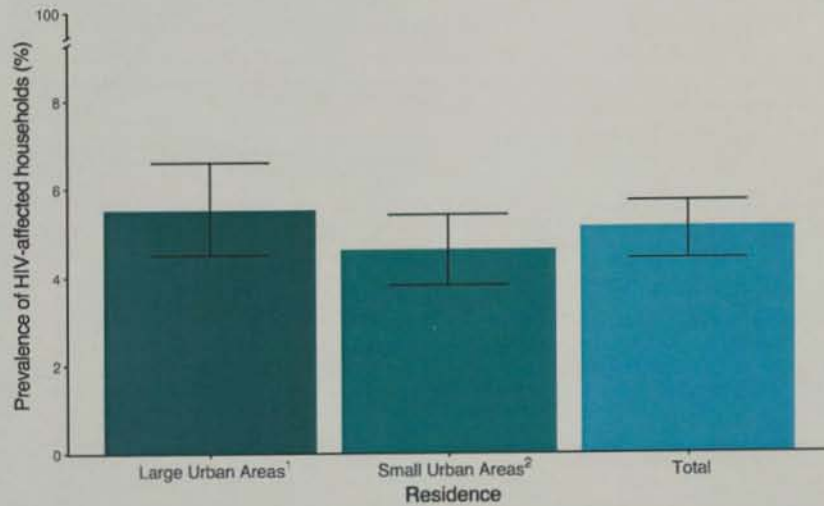
Number of HIV-positive household members	Urban Area Size				Total	
	Small (≤50,000)		Large (>50,000)		Percent	Number
	Percent	Number	Percent	Number		
1	87.0	196	81.7	249	84.2	445
2	10.5	28	16.9	50	13.9	78
3	2.5	6	1.4	4	1.9	10
4	0.0	0	0.0	0	0.0	0
5	0.0	0	0.0	0	0.0	0
≥6	0.0	0	0.0	0	0.0	0
Total	100.0	230	100.0	303	100.0	533

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

Percentage of households with an HIV-positive head of household, by sex of head of household, EPHIA 2017-18

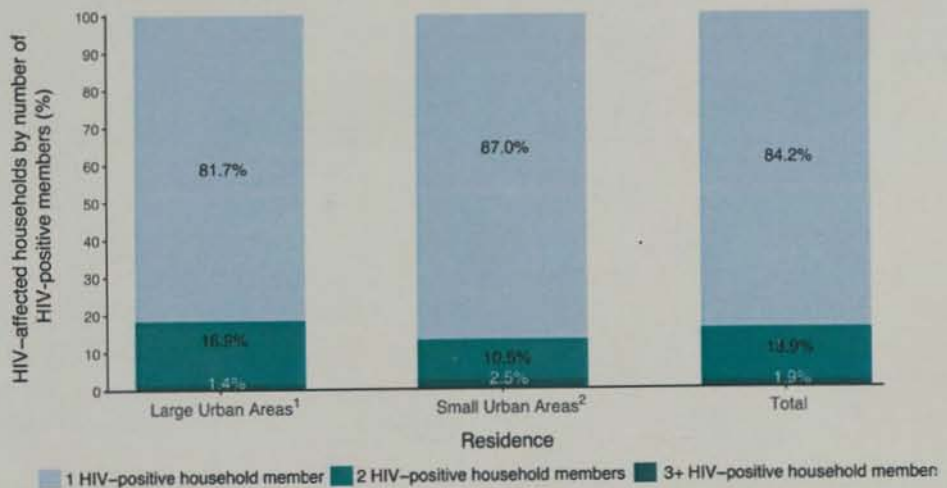
Sex of head of household	Percent	Number
Male	2.3	3,961
Female	5.8	5,001
Total	4.2	8,962

**Figure 3.4.A**  
Prevalence of HIV-affected households by residence, EPHIA 2017-2018

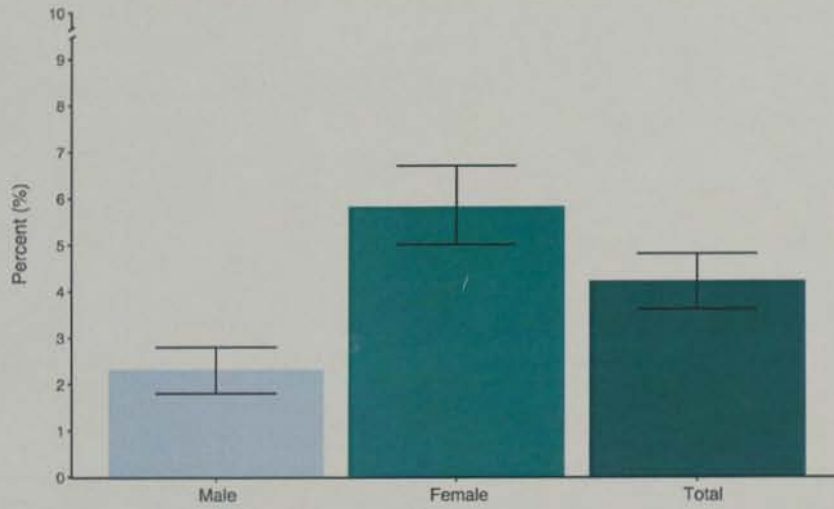


<sup>1</sup>Large Urban Areas are urban areas with populations >50,000 individuals.  
<sup>2</sup>Small Urban Areas are urban areas with populations ≤ 50,000 individuals.

**Figure 3.4.B**  
HIV-affected households by number of HIV-positive members and residence, EPHIA 2017-2018



<sup>1</sup>Large Urban Areas are urban areas with populations >50,000 individuals.  
<sup>2</sup>Small Urban Areas are urban areas with populations ≤ 50,000 individuals.



**Figure 3.4.C**  
Prevalence of  
households with an  
HIV-positive head  
of household by sex,  
EPHIA 2017-2018



## 4. SURVEY RESPONDENT CHARACTERISTICS

### KEY FINDINGS

- Among adult respondents (those aged 15-64 years), 17.4% were older adolescents (15-19 years of age), 72.7% were aged 20-49 years, and 9.9% were aged 50-64 years.
- Approximately half of the respondents were residing in small urban areas, 49.2% of adults and 54.2% of children (those aged 0-14 years).

## 4.2 BACKGROUND

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

## 4.3 DEMOGRAPHIC CHARACTERISTICS OF THE ADULT POPULATION

The majority of the adult respondents were married (46.5%) or living with a partner (5.3%); 42.3% of the men and 29.5% of the women had never been married. In terms of schooling, 35.0% of the adults had completed only primary education, while 28.8% had completed secondary education and only 24.3% had more than secondary education. Overall, 17.4% of the adult respondents were older adolescents and 90.1% were aged 15-49 years, while only 9.9% were older adults aged 50-64 years.

**Table 4.3.A Demographic characteristics of the adult population**

Percent distribution of the adult population aged 15-64 years, by sex and selected demographic characteristics, EPHIA 2017-18						
Characteristic	Male		Female		Total	
	Percent	Number	Percent	Number	Percent	Number
<b>Urban area size</b>						
Small (≤50,000)	51.7	4,093	46.8	5,601	49.2	9,694
Large (>50,000)	48.3	3,919	53.2	6,557	50.8	10,476
<b>Region</b>						
Tigray	6.2	467	8.3	935	7.2	1,402
Afar	1.3	355	1.3	497	1.3	852
Amhara	19.3	1,334	18.4	1,946	18.8	3,280
Oromia	33.6	1,871	33.5	2,837	33.5	4,708
Somali	1.2	367	1.3	590	1.3	957
Benishangul Gumuz	1.4	355	1.2	468	1.3	823
SNNPR	18.1	1,289	14.1	1,506	16.1	2,795
Gambella	0.7	381	0.5	443	0.6	824
Harari	0.6	286	0.7	448	0.7	734
Addis Ababa	16.6	1,030	19.4	1,948	18.0	2,978
Dire Dawa	1.1	277	1.4	540	1.2	817
<b>Marital status</b>						
Never married	42.3	3,552	29.5	3,977	35.9	7,529
Married	47.2	3,585	45.8	5,311	46.5	8,896
Living together	5.7	416	4.9	579	5.3	995
Divorced or separated	4.2	356	12.9	1,473	8.6	1,829
Widowed	0.6	57	6.9	737	3.8	794

Table 4.3.A Demographic characteristics of the adult population (continued)

Percent distribution of the adult population aged 15-64 years, by sex and selected demographic characteristics, EPHIA 2017-18						
Characteristic	Male		Female		Total	
	Percent	Number	Percent	Number	Percent	Number
<b>Education</b>						
No education	5.7	470	18.2	2,068	11.9	2,538
Primary	33.0	2,634	37.0	4,464	35.0	7,098
Secondary	31.3	2,536	26.3	3,247	28.8	5,783
More than secondary	30.0	2,349	18.5	2,333	24.3	4,682
<b>Wealth quintile</b>						
Lowest	17.1	1,460	16.0	2,057	16.5	3,517
Second	19.1	1,567	16.4	2,059	17.7	3,626
Middle	20.3	1,648	19.1	2,358	19.7	4,006
Fourth	21.7	1,698	22.1	2,653	21.9	4,351
Highest	21.9	1,639	26.5	3,030	24.2	4,669
<b>Religion</b>						
Ethiopian Orthodox	57.6	4,435	60.8	6,971	59.2	11,406
Muslim	19.5	1,834	19.8	2,915	19.7	4,749
Roman Catholic	(0.4)	32	0.4	52	0.4	84
Protestant	21.5	1,621	18.5	2,150	20.0	3,771
Other	1.1	79	0.5	63	0.8	142
<b>Ethnicity</b>						
Oromo	31.9	2,093	31.5	3,236	31.7	5,329
Amhara	34.2	2,776	36.2	4,433	35.2	7,209
Tigre	7.9	635	10.1	1,177	9.0	1,812
Afari	0.4	114	0.4	168	0.4	282
Somali	1.2	305	1.3	529	1.2	834
Welaita	3.2	264	2.5	306	2.8	570
Other	21.3	1,798	18.0	2,290	19.6	4,088
<b>Employment status (last 12 months)</b>						
Employed <sup>1</sup>	58.7	4,523	36.4	4,155	47.5	8,678
Not employed	41.3	3,481	63.6	7,984	52.5	11,465

**Table 4.3.A Demographic characteristics of the adult population (continued)**

Characteristic	Percent distribution of the adult population aged 15-64 years, by sex and selected demographic characteristics, EPHIA 2017-18					
	Male		Female		Total	
	Percent	Number	Percent	Number	Percent	Number
<b>Age</b>						
15-19	17.3	1,543	17.5	2,555	17.4	4,098
20-24	17.4	1,367	17.4	2,449	17.4	3,816
25-29	16.4	1,459	17.0	2,284	16.7	3,743
30-34	13.9	963	13.8	1,316	13.8	2,279
35-39	11.4	793	11.0	1,223	11.2	2,016
40-44	8.0	592	7.5	707	7.7	1,299
45-49	6.0	429	5.8	496	5.9	925
50-54	4.3	348	4.2	468	4.2	816
55-59	3.2	286	3.3	305	3.3	591
60-64	2.3	232	2.6	355	2.4	587
Total 15-24	34.7	2,910	34.9	5,004	34.8	7,914
Total 15-49	90.3	7,146	89.9	11,030	90.1	18,176
Total 50-64	9.7	866	10.1	1,128	9.9	1,994
Total 15-64	100.0	8,012	100.0	12,158	100.0	20,170

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

1. Answered yes to the question "Have you done any work in the last 12 months for which you received a paycheck, cash or goods as payment?"

Weighted figures.

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

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

#### 4.4 DEMOGRAPHIC CHARACTERISTICS OF THE PEDIATRIC POPULATION

Survey participants below 10 years of age accounted for 64.3% of all children. More than half of the children resided in small urban areas (54.2%), and the distribution across the five wealth quintiles ranged from 17.5% in the lowest wealth quintile to 22.3% in the fourth wealth quintile (Table 4.4.A).

Table 4.4.A Demographic characteristics of the pediatric population

Percent distribution of the children aged 0-14 years, by sex and selected demographic characteristics, EPHIA 2017-18						
Characteristic	Male		Female		Total	
	Percent	Number	Percent	Number	Percent	Number
<b>Age</b>						
0-17 months	10.4	344	8.2	260	9.3	604
18-59 months	20.6	649	21.9	677	21.3	1,326
5-9 years	33.6	842	33.8	890	33.7	1,732
10-14 years	35.4	802	36.1	922	35.7	1,724
<b>Urban area size</b>						
Small (≤50,000)	54.3	1,411	54.1	1,489	54.2	2,900
Large (>50,000)	45.7	1,226	45.9	1,260	45.8	2,486
<b>Region</b>						
Tigray	8.4	202	8.3	214	8.4	416
Afar	1.4	121	1.4	125	1.4	246
Amhara	15.7	349	15.8	380	15.7	729
Oromia	35.9	628	36.3	678	36.1	1,306
Somali	2.1	193	2.0	195	2.1	388
Benishangul Gumuz	1.4	107	1.3	111	1.3	218
SNNPR	19.5	424	19.8	461	19.7	885
Gambella	0.7	126	0.7	137	0.7	263
Harari	0.7	100	0.5	83	0.6	183
Addis Ababa	13.0	281	12.9	286	13.0	567
Dire Dawa	1.3	106	0.9	79	1.1	185
<b>Wealth quintile</b>						
Lowest	17.2	511	17.7	542	17.5	1,053
Second	17.9	498	18.3	519	18.1	1,017
Middle	20.9	539	21.2	578	21.1	1,117
Fourth	22.8	572	21.8	575	22.3	1,147
Highest	21.1	517	20.9	535	21.0	1,052
Total 0-4	31.0	993	30.1	937	30.6	1,930
Total 0-14	100.0	2,637	100.0	2,749	100.0	5,386

Weighted figures.

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



## 5. HIV INCIDENCE IN ADULTS

### KEY FINDINGS

- Incidence of HIV infection in 2017-2018 among adults (ages 15-64 years) in urban Ethiopia was 0.05%. This corresponds to approximately 6,000 new cases of HIV among adults living in urban Ethiopia.

## 5.2 BACKGROUND

HIV incidence is the measure of new HIV infections in a population over time, providing critical information on the status of the HIV epidemic. Changes in HIV incidence can be used for effective targeted HIV prevention planning in groups that are most vulnerable to infection and to measure impact of HIV prevention programs. HIV incidence is optimal for measuring acute changes in an HIV epidemic, including changes in HIV transmission, as opposed to HIV prevalence, which is a measure of the relative burden of disease in a population. This chapter presents annual estimates of HIV incidence in 2017-2018 among adults in urban areas at the national level. For the purposes of this analysis, HIV incidence is expressed as the cumulative incidence or risk of new infections in a 12-month period, which is a close approximation to the instantaneous incidence rate. It is important to note that the EPHIA primary objective was to estimate prevalence of VLS, to which the sample size was powered. Therefore, the estimate for incidence rates should be interpreted with caution.

Two laboratory-based incidence testing algorithms (HIV-1 LAg avidity plus VL and HIV-1 LAg avidity plus VL and ARV detection) were used to distinguish recent from long-term infection. Incidence estimates were obtained using the formula recommended by the WHO Incidence Working Group and Consortium for Evaluation and Performance of Incidence Assays, and with assay performance characteristics of an MDRI = 130 days (95% CI: 118, 142), with T = 1.0 year and residual PFR = 0.00. Survey weights are utilized for all estimates. All HIV-positive participants 18 months and older were tested for recent infection using HIV-1 LAg avidity assay.

Incidence estimation is based on recent/long-term (LT) classification using algorithms with LAg avidity.<sup>1,2,3</sup> The first testing algorithm (i.e., HIV-1 LAg avidity plus VL) uses VL testing to exclude specimens with low VL and limit misclassification of persons as recent infections who are elite controllers or on effective ART. The second algorithm (i.e., HIV-1 LAg avidity plus VL and ARV detection) uses ARV detection to exclude specimens with high VL and limit misclassification as recent infections of persons who are on ART but have drug resistance or poor treatment adherence. (Note: In EPHIA, one case was reclassified as recent because the participant reported having an initial positive HIV test and ART initiation within three months of the survey interview.)

## 5.3 HIV INCIDENCE AMONG ADULTS

### *HIV incidence estimates using LAg avidity and HIV viral load*

Using the LAg avidity assay and VL algorithm, estimated HIV incidence was 0.06% (95% CI: 0.00-0.12) among adults (those aged 15-64 years). This corresponds to approximately 7,000 new cases of HIV annually in 2017-2018 among adults living in urban Ethiopia. Incidence estimates are based on a small number of recent infections. EPHIA was not powered to estimate incidence in urban areas at the national level; therefore, these estimates should be interpreted with caution (Table 5.3.A).

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

Using the LAg avidity, VL, and ARV detection algorithm, estimated incidence was 0.05% (95% CI: 0.00-0.10) among adults (Table 5.3.B). This corresponds to approximately 6,000 new cases of HIV annually in 2017-2018 among adults living in urban Ethiopia (Table 5.3.C). Incidence estimates are based on a small number of recent infections. EPHIA was not powered to estimate HIV incidence in urban areas at the national level; therefore, these estimates should be interpreted with caution.

**Table 5.3.A Annual HIV incidence using the limiting antigen (LAg) avidity plus viral load algorithm**

Annual incidence of HIV among adults aged 15-49 and 15-64 years, by sex and age, using LAg+VL algorithm, EPHIA 2017-18						
Age	Male		Female		Total	
	Percentage annual incidence <sup>1</sup>	95% CI	Percentage annual incidence <sup>1</sup>	95% CI	Percentage annual incidence <sup>1</sup>	95% CI
15-24	*	*	*	*	0.05	0.00-0.13
25-34	*	*	*	*	0.05	0.00-0.15
35-49	*	*	*	*	0.06	0.00-0.19
15-49	*	*	*	*	0.05	0.00-0.11
50-64	*	*	*	*	0.12	0.00-0.39
15-64	*	*	*	*	0.06	0.00-0.12

<sup>1</sup>Relates to Global AIDS Monitoring Indicator 3.1: HIV incidence.

Weighted figures.

\*Incidence estimates were based on a very small number of recent infections. As the survey was not powered to estimate sex-disaggregated incidence in Ethiopia's urban centers, those estimates are not presented.

**Table 5.3.B Annual HIV incidence using the limiting antigen (LAg) avidity plus viral load (VL) plus antiretroviral (ARV) detection algorithm**

Annual incidence of HIV among persons aged 15-49 and 15-64 years, by sex and age, using the LAg+VL+ARV algorithm, EPHIA 2017-18						
Age	Male		Female		Total	
	Percentage annual incidence <sup>1</sup>	95% CI	Percentage annual incidence <sup>1</sup>	95% CI	Percentage annual incidence <sup>1</sup>	95% CI
15-24	*	*	*	*	0.01	0.00-0.06
25-34	*	*	*	*	0.05	0.00-0.15
35-49	*	*	*	*	0.06	0.00-0.19
15-49	*	*	*	*	0.04	0.00-0.09
50-64	*	*	*	*	0.12	0.00-0.39
15-64	*	*	*	*	0.05	0.00-0.10

<sup>1</sup>Relates to Global AIDS Monitoring Indicator 3.1: HIV incidence.

Weighted figures.

\*Incidence estimates were based on a very small number of recent infections. As the survey was not powered to estimate sex-disaggregated incidence in Ethiopia's urban centers, those estimates are not presented.

One long-term case according to the LAg+VL+ARV algorithm was reclassified to recent because the respondent indicated in the interview that they started treatment within the recent infection time window.

**Table 5.3.C People living with HIV and number of new HIV infections per year incorporating antiretroviral (ARV) detection into the recent infection algorithm**

People living with HIV and number of new HIV infections per year, among adults aged 15-49 and 15-64 years, by age, using the limiting antigen (LAG) avidity plus viral load (VL) plus antiretroviral detection algorithm, EPHIA 2017-2018

Age	People living with HIV	95% CI	Number of new infections per year	95% CI
0-14	18,593	7,535 - 29,651	NA	NA
15-24	32,236	21,510 - 42,962	652	0-2,685
25-34	100,093	79,169 - 121,017	1,977	0-5,807
35-49	196,113	164,648 - 227,579	1,801	0-5,711
15-49	328,442	281,014 - 375,871	4,430	0-10,097
50-64	55,569	42,908 - 68,230	1,493	0-4,758
15-64	384,011	331,824 - 436,199	5,924	0-12,486

Weighted figures.  
One long-term case according to the LAg+VL+ARV algorithm was reclassified to recent because the respondent indicated in the interview that they started treatment within the recent infection time window.

## 5.4 GAPS AND UNMET NEEDS

- Based upon the ARV-adjusted incidence, approximately 6,000 new HIV infections occurred annually in urban Ethiopia at the time of the survey. The data suggest that there is still a deficit in the effective implementation of strategies to stop transmission and prevent the occurrence of new HIV infections.

## 5.5 REFERENCES

- Duong YT, Kassarjee R, Welte A, et al. Recalibration of the limiting antigen avidity EIA to determine mean duration of recent infection in divergent HIV-1 subtypes. *PLoS One*. 2015 Feb 24;10(2):e0114947. doi: 10.1371/journal.pone.0114947.
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- Duong YT, Qiu M, De AK, et al. Detection of recent HIV-1 infection using a new limiting-antigen avidity assay: potential for HIV-1 incidence estimates and avidity maturation studies. *PLoS One*. 2012;7(3):e33328. doi: 10.1371/journal.pone.0033328. Epub 2012 Mar 27.



## 6. HIV PREVALENCE IN ADULTS

### KEY FINDINGS

- Prevalence of HIV infection among adults (ages 15 years) in Ethiopia was 3.0%: 4.1% among women and 1.9% among men. This corresponds to approximately 384,000 adults living with HIV in the urban areas of the country.
- HIV prevalence among women was significantly higher than among men in ages 25-29, 30-34, and 35-39 years.
- HIV prevalence was the highest (14.7%) among widowed adults and the lowest (1.0%) among those who had never married—a group dominated by younger segments of the population.
- The burden of adult HIV infection varies across regions in urban areas of the country. HIV prevalence among adults ranged from 0.8% in Somali to 5.7% in Gambella.

## 6.2 BACKGROUND

This chapter presents representative estimates of prevalence of HIV infection among adults at the national and regional levels by selected demographic characteristics in urban areas of Ethiopia. It also presents estimates of the number of adults living with HIV in urban Ethiopia.

HIV testing was conducted in each household using a serological rapid diagnostic testing algorithm based on Ethiopia's national guidelines, with laboratory confirmation of seropositive samples using a supplemental assay.

*Appendix A describes the EPHIA sampling design.*

*Appendix B describes the EPHIA HIV testing methodology.*

*Appendix C describes the EPHIA sampling errors.*

## 6.3 ADULT HIV PREVALENCE BY AGE AND SEX

Overall, HIV prevalence among adults was 3.0%: 1.9% in men, and 4.1% in women (Table 6.3.A). This corresponds to approximately 384,000 adults living with HIV in the urban areas of the country (Table 5.3.C)

In adults, HIV prevalence ranged from 0.6% in those aged 20-24 years to 7.0% in those aged 40-44 years. The peak HIV prevalence in females was 9.1%, observed in ages 35-39 years, and the peak HIV prevalence in males was 5.7%, observed in ages 40-44 years. Prevalence among women aged 15-24 years was 0.8%, compared to 2.8% among women aged 25-29 years. Prevalence among older adults aged 50-64 years was 4.4% (4.7% for women and 4.2% for men) (Table 6.3.A).

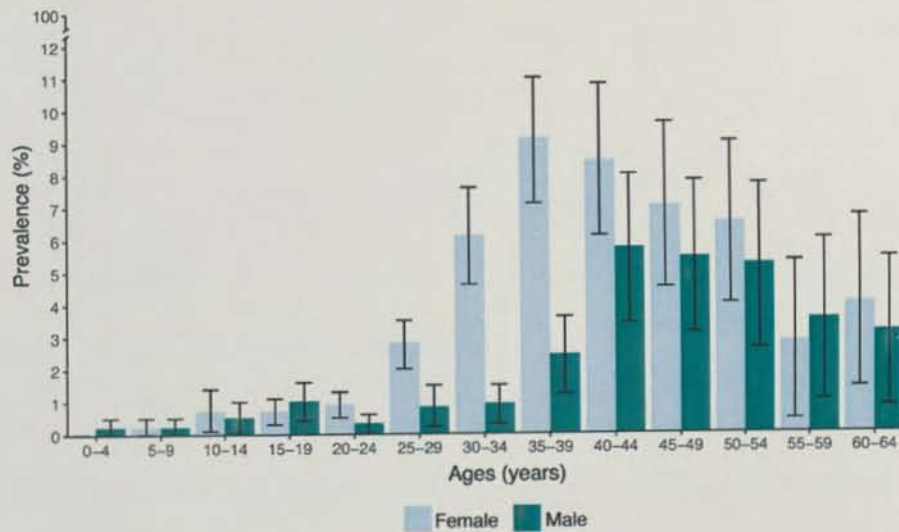
HIV prevalence in women was more than twice (4.1%) that of men (1.9%). Differences in prevalence between men and women were statistically significant in the 5-year age brackets of 25-29 years, 30-34 years, and 35-39 years (with non-overlapping 95% CIs). Among adults aged 15-49 years, HIV prevalence was higher among women (4.0%) than among men (1.7%), and HIV prevalence among those aged 25-29 years was more than three times higher in women (2.8%) compared to men (0.8%) (Table 6.3.A, Figure 6.3.A).

Table 6.3.A HIV prevalence by age and sex

Prevalence of HIV among persons aged 0-64 years, by sex and age, EPHIA 2017-18						
Age	Male		Female		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
0-17 months	0.0	263	0.0	192	0.0	455
18-59 months	0.3	566	0.0	570	0.1	1,136
5-9	0.2	737	0.2	792	0.2	1,529
10-14	0.5	740	0.7	869	0.6	1,609
Total 0-4	0.2	829	0.0	762	0.1	1,591
Total 0-14	0.3	2,306	0.3	2,423	0.3	4,729
15-19	1.0	1,473	0.7	2,451	0.9	3,924
20-24	0.3	1,286	0.9	2,337	0.6	3,623
25-29	0.8	1,340	2.8	2,169	1.8	3,509
30-34	0.9	903	6.1	1,252	3.5	2,155
35-39	2.4	746	9.1	1,162	5.7	1,908
40-44	5.7	553	8.4	675	7.0	1,228
45-49	5.4	413	7.0	466	6.2	879
50-54	5.2	328	6.5	444	5.8	772
55-59	3.5	272	2.8	293	3.2	565
60-64	3.1	223	4.0	350	3.6	573
Total 15-24	0.6	2,759	0.8	4,788	0.7	7,547
Total 15-49	1.7	6,714	4.0	10,512	2.9	17,226
Total 50-64	4.2	823	4.7	1,087	4.4	1,910
Total 15-64	2.0	7,537	4.1	11,599	3.0	19,136

Weighted figures.

**Figure 6.3.A**  
HIV prevalence  
by age and sex,  
EPHIA 2017-2018



#### 6.4 ADULT HIV PREVALENCE BY OTHER DEMOGRAPHIC CHARACTERISTICS

HIV prevalence was higher among adults with no education or primary education (5.2%, 4.2%, respectively) compared to those with secondary (2.4%) or more than secondary school education (1.0%). HIV prevalence in women with no education or primary education was higher (6.2%, 5.1%, respectively) than those with secondary or more than secondary education (3.2%, 1.1%, respectively). HIV prevalence in men did not differ by education status (Table 6.4.A).

HIV prevalence was highest among widowed adults (14.7%) and lowest among those who had never married (1.0%), a group dominated by younger segments of the population. Among married women and women living with a partner, HIV prevalence was 3.1% and 3.4%, respectively. In comparison, HIV prevalence was twice as high among women who were divorced or separated (8.6%) and almost five times as high (15.1%) among women who were widowed.

HIV prevalence among women of childbearing age (ages 15-49 years) who were pregnant at the time of the survey was estimated to be 2.2%, compared to 4.2% among women of childbearing age who were not pregnant (Table 6.4.B).

Table 6.4.A HIV prevalence by demographic characteristics: Ages 15-64 years

Prevalence of HIV among persons aged 15-64 years, by sex and selected demographic characteristics, EPHIA 2017-18						
Characteristic	Male		Female		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
<b>Urban area size</b>						
Small (≤50,000)	1.9	3,884	3.8	5,361	2.8	9,245
Large (>50,000)	2.0	3,653	4.4	6,238	3.2	9,891
<b>Region</b>						
Tigray	0.7	455	4.1	914	2.7	1,369
Afar	3.6	340	4.6	481	4.1	821
Amhara	2.9	1,214	5.4	1,785	4.1	2,999
Oromia	1.9	1,775	4.1	2,735	3.0	4,510
Somali	0.5	356	1.0	570	0.8	926
Benishangul Gumuz	1.8	343	3.2	455	2.4	798
SNNPR	1.1	1,218	2.6	1,447	1.8	2,665
Gambella	4.0	369	8.0	419	5.7	788
Harari	1.6	265	7.6	432	4.6	697
Addis Ababa	2.0	939	3.9	1,841	3.1	2,780
Dire Dawa	3.3	263	5.7	520	4.6	783
<b>Marital status</b>						
Never married	0.8	3,315	1.2	3,788	1.0	7,103
Married	2.4	3,401	3.1	5,081	2.8	8,482
Living together	3.0	394	3.4	542	3.2	936
Divorced or separated	5.1	329	8.6	1,394	7.7	1,723
Widowed	10.0	55	15.1	717	14.7	772
<b>Education</b>						
No education	1.8	441	6.2	1,959	5.2	2,400
Primary	3.2	2,508	5.1	4,295	4.2	6,803
Secondary	1.7	2,392	3.2	3,096	2.4	5,488
More than secondary	0.9	2,173	1.1	2,203	1.0	4,376
<b>Wealth quintile</b>						
Lowest	1.7	1,383	4.6	1,945	3.1	3,328
Second	1.9	1,465	4.5	1,964	3.1	3,429
Middle	2.5	1,555	4.6	2,255	3.5	3,810
Fourth	2.1	1,611	4.4	2,538	3.2	4,149
Highest	1.5	1,523	2.9	2,897	2.3	4,420

Table 6.4.B HIV prevalence by demographic characteristics: Ages 15-49 years

Prevalence of HIV among persons aged 15-49 years, by sex and selected demographic characteristics, EPHIA 2017-18						
Characteristic	Male		Female		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
<b>Urban area size</b>						
Small (≤50,000)	1.7	3,488	3.8	4,872	2.7	8,360
Large (>50,000)	1.7	3,226	4.2	5,640	3.0	8,866
<b>Region</b>						
Tigray	0.6	389	4.5	818	2.8	1,207
Afar	3.1	306	4.6	444	3.8	750
Amhara	2.6	1,094	5.4	1,620	4.0	2,714
Oromia	1.7	1,551	3.9	2,455	2.8	4,006
Somali	0.0	313	0.7	512	0.4	825
Benishangul Gumuz	1.9	323	3.3	437	2.6	760
SNNPR	0.9	1,127	2.5	1,367	1.6	2,494
Gambella	4.3	344	8.0	403	5.9	747
Harari	1.8	230	7.7	387	4.8	617
Addis Ababa	1.7	814	3.8	1,631	2.8	2,445
Dire Dawa	2.6	223	5.8	438	4.4	661
<b>Marital status</b>						
Never married	0.7	3,287	1.2	3,740	0.9	7,027
Married	2.3	2,773	3.2	4,659	2.8	7,432
Living together	2.6	327	3.5	502	3.1	829
Divorced or separated	5.1	257	9.0	1,171	8.1	1,428
Widowed	(8.2)	29	21.1	366	19.9	395
<b>Education</b>						
No education	1.3	337	7.0	1,487	5.6	1,824
Primary	3.1	2,151	5.1	3,860	4.2	6,011
Secondary	1.4	2,221	3.0	2,983	2.2	5,204
More than secondary	0.7	1,985	1.1	2,145	0.8	4,130
<b>Wealth quintile</b>						
Lowest	1.7	1,266	4.6	1,744	3.1	3,010
Second	1.8	1,344	4.4	1,813	3.0	3,157
Middle	2.2	1,413	4.6	2,085	3.4	3,498
Fourth	1.7	1,408	4.3	2,293	3.0	3,701
Highest	1.1	1,283	2.8	2,577	2.1	3,860

Table 6.4.B HIV prevalence by demographic characteristics: Ages 15-49 years (continued)

Prevalence of HIV among persons aged 15-49 years, by sex and selected demographic characteristics, EPHIA 2017-18						
Characteristic	Male		Female		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
<b>Religion</b>						
Ethiopian Orthodox	2.1	3,622	5.3	5,909	3.7	9,531
Muslim	1.7	1,567	2.0	2,543	1.8	4,110
Roman Catholic	(0.0)	29	(1.2)	44	0.6	73
Protestant	1.0	1,420	2.3	1,957	1.6	3,377
Other	0.0	69	3.2	53	1.0	122
<b>Ethnicity</b>						
Oromo	1.5	1,754	3.7	2,813	2.6	4,567
Amhara	2.6	2,263	5.5	3,703	4.1	5,966
Tigre	0.7	515	4.6	1,022	2.9	1,537
Afari	3.1	98	2.3	152	2.7	250
Somali	0.0	255	0.3	457	0.2	712
Welaita	0.5	230	3.7	285	1.9	515
Other	1.3	1,579	2.0	2,066	1.6	3,645
<b>Employment status (last 12 months)</b>						
Employed	1.8	3,730	5.1	3,674	3.1	7,404
Not employed	1.5	2,976	3.4	6,823	2.6	9,799
<b>Pregnancy status</b>						
Currently pregnant	NA	NA	2.2	609	NA	NA
Not currently pregnant	NA	NA	4.2	9,781	NA	NA
<b>Circumcision status</b>						
Circumcised	1.7	6,402	NA	NA	NA	NA
Medical circumcision	1.3	1,447	NA	NA	NA	NA
Non-medical circumcision	1.9	4,726	NA	NA	NA	NA
Unknown whether medical or non-medical	1.6	229	NA	NA	NA	NA
Uncircumcised	1.1	300	NA	NA	NA	NA
Unknown	*	12	NA	NA	NA	NA
<b>Total 15-49</b>	<b>1.7</b>	<b>6,714</b>	<b>4.0</b>	<b>10,512</b>	<b>2.9</b>	<b>17,226</b>

Weighted figures.

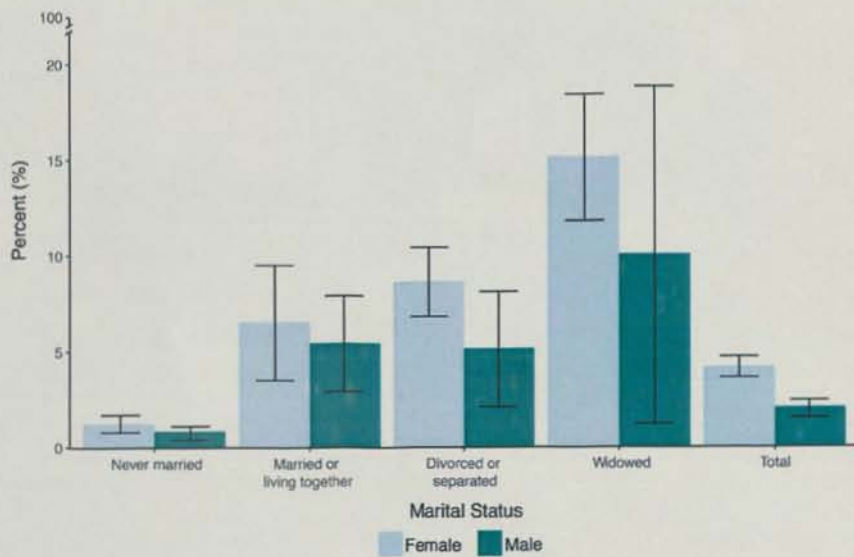
The sum of the sample sizes for a given classification may be less than the total sample size because of missing responses to the classification variable.

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

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

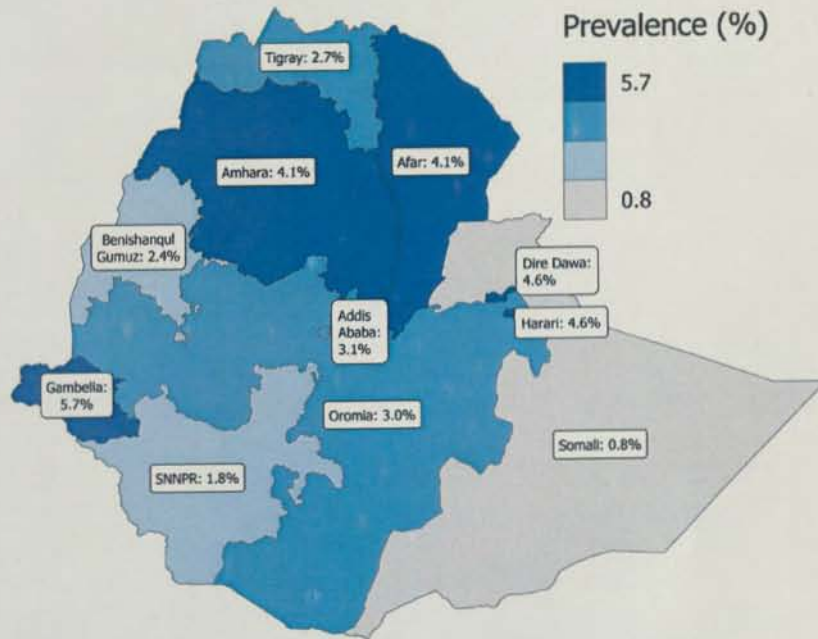
## 6.5 ADULT HIV PREVALENCE BY REGION

The burden of HIV infection varied across regions in urban Ethiopia. HIV prevalence among adults ranged from 0.8% in Somali to 5.7% in Gambella (Figures 6.5.A and 6.5.B, Table 6.4.A).

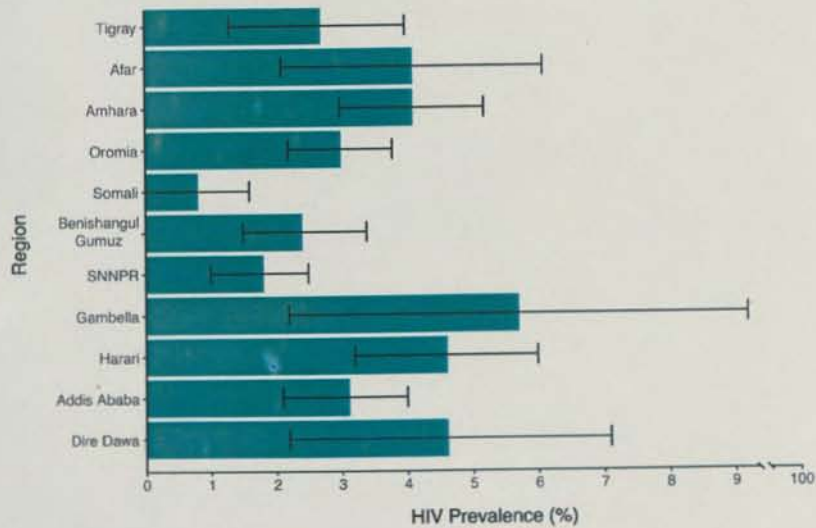


**Figure 6.4.A**  
HIV prevalence by marital status: Ages 15-64 years, EPHIA 2017-2018

**Figure 6.5.A**  
HIV prevalence among adults aged 15-64 years, by region, EPHIA 2017-2018



**Figure 6.5.B**  
HIV prevalence among adults aged 15-64 years, by region, EPHIA 2017-2018





## 7. SELF-REPORTED HIV TESTING

### KEY FINDINGS

- In Ethiopia, 69.8% of the urban population of adults (ages 15-64 years) had ever tested for HIV and received their results (73.0% of women and 66.5% of men), based upon self-report.
- In Ethiopia, 23.4% of the urban adult population reported having HIV testing and receiving results in the 12 months preceding the survey (26.7% of women and 20.0% of men).
- Among adults who tested positive in EPHIA, 90.6% reported ever testing for HIV and receiving their results (84.8% among men and 93.2% among women), while only 19.0% were tested and received their results in 12 months preceding the survey.
- Only 28.9% of older adolescent boys and 36% older adolescent girls (those aged 15-19 years) reported ever testing for HIV and having received their results.

## 7.2 BACKGROUND

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

Data presented in this section pertain to men and women, who reported ever receiving an HIV test and receiving the test results. Results on HIV testing in the 12 months preceding the survey and receiving the test results are also presented to understand frequent or recent testing.

## 7.3 SELF-REPORTED HIV TESTING AMONG ADULTS

Overall, 69.8% of adults reported that they had ever tested for HIV and received their results, while 23.4% indicated that they had tested in the 12 months preceding the survey and received their results. About 66.5% of men and 73.0% of women reported having ever tested for HIV and receiving their test results. The proportion of women who tested for HIV in the year preceding the survey was higher (26.7%) than men (20.0%) (Tables 7.3.A, 7.3.B, and 7.3.C).

While approximately two-thirds or over of men in most age groups reported ever testing for HIV and receiving their results, only 28.9% of older adolescent boys (those aged 15-19 years) reported ever testing for HIV and having received their results (as opposed to 62.9% of young men aged 20-24 years). Among the male population, the percentage testing for HIV and receiving results in the year before the survey ranged from 9.6% among older adolescent boys to 28.9% among men aged 25-29 years (Table 7.3.A, Figure 7.3.A).

Nearly three-quarters (73.0%) of women reported ever testing and receiving their results, while only 26.7% indicated that they had tested and received results in the 12 months preceding the survey. Among the female population, 36.0% of older adolescent girls had ever been tested for HIV and received results, compared to 77.6% among women aged 20-24 years. Among older women aged 45-64 years, the proportion ever tested ranged from 50.4% among ages 60-64 years to 70.6% among ages 45-49 years. The percentage of the female population, testing for HIV and receiving results in the year preceding the survey ranged from 14.9% among older adolescent girls to 37.1% among women aged 25-29 years (Tables 7.3.B, Figure 7.3.A).

There were variations in ever testing and recent HIV testing by education status. Among adults, 65.7% of those with no education have ever tested for HIV and received their results and 19.9% tested in the year preceding the survey, while 79.1% of those with more than secondary education reported ever testing and 28.6% reported testing in the year preceding the survey. Among men with more than secondary education, 77.5% reported having ever tested for HIV and receiving their results, compared to 62.4% of men with no education. Women with more than secondary education had the highest percentage of having ever been tested for HIV, and testing for HIV in the year preceding the survey, (81.6% and 33.1%, respectively; Tables 7.3.A, 7.3.B and 7.3.C).

Among men, about three-quarters of those who were married, cohabitating, or divorced or separated (78.7%, 74.8% and 78.5%, respectively) reported ever testing for HIV. Percentages of testing were even higher among women: 86.4% of married, 81.5% of cohabitating women, and 80.0% of divorced or separated women reported ever testing for HIV. Among both men and women, less than half of those who were never married had ever been tested (50.6% and 48.1%, respectively; Tables 7.3.A and 7.3.B).

The proportion of adults who reported ever testing for HIV and receiving the results ranged from 31.4% in the Somali region to 66.0% in SNNPR to 81.1% in Harari. The proportion tested in the 12 months preceding the survey ranged from 11.2% in the Somali region to 20.2% in SNNPR to 32.5% in Harari and 32.8% in Afar. This pattern was observed both among women and men across all regions.

The proportion of adults living in large urban areas who had ever tested and received their results (72.6%) was slightly higher than the proportion among adults living in smaller urban areas (66.8%). Similarly, 25.6% of adults in large urban areas had tested within the 12 months preceding the survey compared to 21.0% in the small urban areas (Table 7.3.C).

Among adults who tested positive in EPHIA, 90.6% reported ever testing for HIV and receiving their results (84.8% among men and 93.2% among women). Among those testing negative in EPHIA, 66.0% of men and 72.0% of women reported ever testing for HIV. Among those who were not tested in EPHIA, 71.0% reported having ever tested for HIV and receiving their results (68.8% among men and 73.8% among women) (Tables 7.3.A, 7.3.B and 7.3.C).

**Table 7.3.A Self-reported HIV testing: Men**

Percentage of men aged 15-64 years who ever received HIV testing and received their test results, and percentage who received HIV testing and received their test results in the 12 months before the survey, by result of PHIA survey HIV test and selected demographic characteristics, EPHIA 2017-18

Characteristic	Percentage who ever received HIV testing and received results	Percentage who received HIV testing in the 12 months before the survey and received results <sup>1</sup>	Number
<b>Result of PHIA survey HIV test</b>			
HIV positive	84.8	17.7	152
HIV negative	66.0	19.5	7,246
Not tested	68.8	27.6	467
<b>Urban area size</b>			
Small (≤50,000)	63.6	17.4	4,019
Large (>50,000)	69.7	22.7	3,846
<b>Region</b>			
Tigray	71.4	24.2	453
Afar	76.2	29.4	339
Amhara	69.8	19.8	1,314
Oromia	62.4	16.6	1,834
Somali	30.4	8.2	352
Benishangul Gumuz	69.7	23.5	353
SNNPR	63.5	17.6	1,280
Gambella	71.3	24.3	373
Harari	81.9	29.5	280
Addis Ababa	73.1	26.7	1,016
Dire Dawa	71.8	30.5	271

Table 7.3.A Self-reported HIV testing: Men (continued)

Percentage of men aged 15-64 years who ever received HIV testing and received their test results, and percentage who received HIV testing and received their test results in the 12 months before the survey, by result of PHIA survey HIV test and selected demographic characteristics, EPHIA 2017-18

Characteristic	Percentage who ever received HIV testing and received results	Percentage who received HIV testing in the 12 months before the survey and received results <sup>1</sup>	Number
<b>Marital status</b>			
Never married	50.6	17.7	3,492
Married	78.7	21.8	3,520
Living together	74.8	19.2	408
Divorced or separated	78.5	23.3	354
Widowed	75.4	16.5	57
<b>Education</b>			
No education	62.4	16.4	456
Primary	61.1	16.3	2,589
Secondary	62.4	18.8	2,495
More than secondary	77.5	25.9	2,307
<b>Wealth quintile</b>			
Lowest	56.6	15.2	1,438
Second	64.4	18.3	1,533
Middle	70.5	22.5	1,627
Fourth	68.9	19.6	1,668
Highest	70.1	23.1	1,599
<b>Religion</b>			
Ethiopian Orthodox	68.6	21.7	4,349
Muslim	64.3	17.8	1,794
Roman Catholic	(59.8)	(13.0)	32
Protestant	62.9	16.9	1,602
Other	68.4	26.1	77
<b>Ethnicity</b>			
Oromo	63.3	17.5	2,067
Amhara	71.0	22.4	2,723
Tigre	71.1	23.8	617
Afari	69.9	29.2	108
Somali	26.6	9.6	292
Welaita	62.9	15.9	257
Other	64.8	19.1	1,774
<b>Employment status (last 12 months)</b>			
Employed	75.4	22.6	4,453
Not employed	53.9	16.2	3,408

Table 7.3.A Self-reported HIV testing: Men (continued)

Percentage of men aged 15-64 years who ever received HIV testing and received their test results, and percentage who received HIV testing and received their test results in the 12 months before the survey, by result of PHIA survey HIV test and selected demographic characteristics, EPHIA 2017-18

Characteristic	Percentage who ever received HIV testing and received results	Percentage who received HIV testing in the 12 months before the survey and received results <sup>1</sup>	Number
<b>Age</b>			
15-19	28.9	9.6	1,502
20-24	62.9	23.4	1,348
25-29	78.1	28.9	1,436
30-34	80.2	21.8	946
35-39	80.0	22.5	789
40-44	79.0	19.0	580
45-49	76.6	17.3	424
50-54	73.2	15.7	339
55-59	66.1	12.4	274
60-64	61.8	1.9	227
Total 15-24	46.0	16.5	2,850
Total 15-49	66.4	20.6	7,025
Total 50-64	68.2	13.8	840
Total 15-64	66.5	20.0	7,865

<sup>1</sup>Relates to PEPFAR Indicator HTS\_TST: Number of individuals who received HIV Testing Services (HTS) and received their test results.

Weighted figures.

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

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

Table 7.3.B Self-reported HIV testing: Women

Percentage of women aged 15-64 years who ever received HIV testing and received their test results, and percentage who received HIV testing and received their test results in the 12 months before the survey, by result of survey HIV test and selected demographic characteristics, EPHIA 2017-18

Characteristic	Percentage who ever received HIV testing and received results	Percentage who received HIV testing in the 12 months before the survey and received results <sup>1</sup>	Number
<b>Result of PHIA survey HIV test</b>			
HIV positive	93.2	19.6	458
HIV negative	72.0	26.6	10,989
Not tested	73.8	34.7	548
<b>Urban area size</b>			
Small (≤50,000)	70.4	25.1	5,518
Large (>50,000)	75.2	28.2	6,477
<b>Region</b>			
Tigray	81.6	33.7	918
Afar	83.1	36.5	488
Amhara	75.5	29.0	1,920
Oromia	70.6	24.3	2,788
Somali	32.3	13.8	576
Benishangul Gumuz	71.6	28.2	465
SNNPR	69.2	23.5	1,498
Gambella	78.9	32.4	432
Harari	80.4	35.3	442
Addis Ababa	75.4	27.3	1,939
Dire Dawa	74.6	33.5	529
<b>Marital status</b>			
Never married	48.1	18.1	3,918
Married	86.4	32.5	5,264
Living together	81.5	28.5	571
Divorced or separated	80.0	28.4	1,464
Widowed	71.0	20.3	724
<b>Education</b>			
No education	66.7	21.0	2,042
Primary	72.4	25.8	4,398
Secondary	71.6	27.5	3,204
More than secondary	81.6	33.1	2,311
<b>Wealth quintile</b>			
Lowest	63.2	22.1	2,018
Second	73.5	28.5	2,037
Middle	75.0	27.9	2,338
Fourth	76.3	27.7	2,617
Highest	74.3	26.7	2,984

Table 7.3.B Self-reported HIV testing: Women (continued)

Percentage of women aged 15-64 years who ever received HIV testing and received their test results, and percentage who received HIV testing and received their test results in the 12 months before the survey, by result of survey HIV test and selected demographic characteristics, EPHIA 2017-18

Characteristic	Percentage who ever received HIV testing and received results	Percentage who received HIV testing in the 12 months before the survey and received results <sup>1</sup>	Number
<b>Religion</b>			
Ethiopian Orthodox	75.5	28.3	6,887
Muslim	69.7	25.8	2,861
Roman Catholic	57.4	28.2	51
Protestant	68.3	22.7	2,126
Other	72.6	26.6	63
<b>Ethnicity</b>			
Oromo	69.2	24.3	3,195
Amhara	76.8	28.4	4,378
Tigre	80.2	31.7	1,158
Afari	82.1	32.5	164
Somali	27.1	11.1	514
Welaita	68.8	24.2	298
Other	71.1	26.0	2,269
<b>Employment status (last 12 months)</b>			
Employed	82.4	31.7	4,123
Not employed	67.5	23.9	7,856
<b>Age</b>			
15-19	36.0	14.9	2,484
20-24	77.6	35.8	2,426
25-29	90.1	37.1	2,273
30-34	89.0	33.0	1,304
35-39	87.1	27.3	1,215
40-44	80.1	20.8	697
45-49	70.6	17.7	487
50-54	62.6	16.0	461
55-59	56.3	13.1	302
60-64	50.4	11.2	346
Total 15-24	56.9	25.4	4,910
Total 15-49	74.7	28.2	10,886
Total 50-64	57.4	13.8	1,109
Total 15-64	73.0	26.7	11,995

<sup>1</sup>Relates to PEPFAR Indicator HTS\_TST: Number of individuals who received HIV Testing Services (HTS) and received their test results. Weighted figures.

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

Table 7.3.C Self-reported HIV testing: Total

Percentage of persons aged 15-64 years who ever received HIV testing and received their test results, and percentage who received HIV testing and received their test results in the 12 months before the survey, by result of PHIA survey HIV test and selected demographic characteristics, EPHIA 2017-18

Characteristic	Percentage who ever received HIV testing and received results	Percentage who received HIV testing in the 12 months before the survey and received results <sup>1</sup>	Number
<b>Result of PHIA survey HIV test</b>			
HIV positive	90.6	19.0	610
HIV negative	69.0	23.0	18,235
Not tested	71.0	30.7	1,015
<b>Urban area size</b>			
Small (≤50,000)	66.8	21.0	9,537
Large (>50,000)	72.6	25.6	10,323
<b>Region</b>			
Tigray	77.3	29.7	1,371
Afar	79.6	32.8	827
Amhara	72.6	24.3	3,234
Oromia	66.5	20.5	4,622
Somali	31.4	11.2	928
Benishangul Gumuz	70.6	25.7	818
SNNPR	66.0	20.2	2,778
Gambella	74.6	27.8	805
Harari	81.1	32.5	722
Addis Ababa	74.3	27.0	2,955
Dire Dawa	73.4	32.2	800
<b>Marital status</b>			
Never married	49.6	17.9	7,410
Married	82.5	27.1	8,784
Living together	77.9	23.5	979
Divorced or separated	79.7	27.1	1,818
Widowed	71.4	20.0	781
<b>Education</b>			
No education	65.7	19.9	2,498
Primary	67.1	21.3	6,987
Secondary	66.6	22.8	5,699
More than secondary	79.1	28.6	4,618
<b>Wealth quintile</b>			
Lowest	59.8	18.5	3,456
Second	68.6	23.0	3,570
Middle	72.7	25.2	3,965
Fourth	72.6	23.7	4,285
Highest	72.4	25.1	4,583

Table 7.3.C Self-reported HIV testing: Total (continued)

Percentage of persons aged 15-64 years who ever received HIV testing and received their test results, and percentage who received HIV testing and received their test results in the 12 months before the survey, by result of PHIA survey HIV test and selected demographic characteristics, EPHIA 2017-18

Characteristic	Percentage who ever received HIV testing and received results	Percentage who received HIV testing in the 12 months before the survey and received results <sup>1</sup>	Number
<b>Religion</b>			
Ethiopian Orthodox	72.2	25.1	11,236
Muslim	67.0	21.8	4,655
Roman Catholic	58.6	20.6	83
Protestant	65.4	19.6	3,728
Other	69.9	26.3	140
<b>Ethnicity</b>			
Oromo	66.2	20.9	5,262
Amhara	74.0	25.5	7,101
Tigre	76.2	28.3	1,775
Afari	76.1	30.9	272
Somali	26.8	10.4	806
Welaita	65.5	19.6	555
Other	67.7	22.3	4,043
<b>Employment status (last 12 months)</b>			
Employed	78.1	26.1	8,576
Not employed	62.1	20.9	11,264
<b>Age</b>			
15-19	32.4	12.3	3,986
20-24	70.3	29.6	3,774
25-29	84.3	33.1	3,709
30-34	84.6	27.4	2,250
35-39	83.5	24.9	2,004
40-44	79.6	19.9	1,277
45-49	73.6	17.5	911
50-54	68.0	15.9	800
55-59	61.0	12.8	576
60-64	55.7	11.5	573
Total 15-24	51.5	21.0	7,760
Total 15-49	70.5	24.4	17,911
Total 50-64	62.7	13.8	1,949
Total 15-64	69.8	23.4	19,860

<sup>1</sup>Relates to PEPFAR Indicator HTS\_TST: Number of individuals who received HIV Testing Services (HTS) and received their test results.

Weighted figures.

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



## 8. HIV DIAGNOSIS AND TREATMENT

### KEY FINDINGS

- Based on self-reported data, among HIV-positive adults (ages 15-64 years), 27.2% were unaware of their HIV-positive status: 37.1% of men and 22.3% of women.
- Overall, 69.0% of HIV-positive adults reported ART use.
- Overall, ARVs were detected in 73.5% of HIV-positive adults: 65.5% of men and 77.4% of women who reported current use.
- Among adults living with HIV who reported no previous HIV-positive diagnosis, 19.0% had ARVs detectable in their blood: 16.5% among men and 21.1% among women.
- ARVs were detected in 95.2% of adults who reported current use of ART: 93.7% of men and 95.8% of women.

## 8.2 BACKGROUND

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

## 8.3 SELF-REPORTED DIAGNOSIS AND TREATMENT STATUS AMONG HIV-POSITIVE ADULTS

Among HIV-positive adults, based on self-report, 27.2% were unaware of their HIV-positive status: 37.1% of men and 22.3% of women (Tables 8.3.A, 8.3.B and 8.3.C).

In large urban areas, 42.2% of HIV-positive men were unaware of their status, compared to 32.0% among those in small urban areas (Table 8.3.A). Awareness of HIV status among women did not vary by residence with 23.6% and 20.6% unaware among those residing in large and small urban areas, respectively (Table 8.3.B).

Among HIV-positive men, the percentage of those who reported they were unaware of their HIV status was 43.5% among adults aged 15-49 years and 13.9% among older adults aged 50-64 years (Table 8.3.A). Among HIV-positive women, the percentage who reported that they were unaware of their HIV status ranged from 51.7% among those aged 15-24 years to 25.4% among older women aged 50-64 years (Table 8.3.B).

Among HIV-positive men, 61.1% were aware of their status and on ART, while 72.9% of HIV-positive women were aware of their status and on ART. (Tables 8.3.A, and 8.3.B).

The percentage of HIV-positive men who reported ART use ranged from 55.1% among those aged 15-49 years to 82.9% among older adults aged 50-64 years, while the percentage of HIV-positive women who reported being on ART ranged from 66.1% among those aged 25-29 years to 82.0% among those aged 30-34 years (Tables 8.3.A and 8.3.B).

Among married HIV-positive adults, 67.1% were aware of their status and on ART, 60.6% of men and 72.6% of women, while among those who had never married, 64.7% reported being on ART, 68.0% of men and 61.8% of women (Tables 8.3.A, 8.3.B and 8.3.C).

Overall, among HIV-positive adults, the percentage unaware of their status varied from 11.5% in Tigray to 41.6% in Gambella (Table 8.3.C). (Note: Not every region had a sample size large enough to make an estimate.)

Table 8.3.A HIV treatment status: Men

Percent distribution of HIV-positive men aged 15-64 years by self-reported HIV diagnosis and treatment status, by selected demographic characteristics, EPHIA 2017-18

Characteristic	Aware of HIV status			Total	Number
	Unaware of HIV status	Not on ART	On ART <sup>1</sup>		
<b>Urban area size</b>					
Small (≤50,000)	32.0	0.2	67.7	100.0	71
Large (>50,000)	42.2	3.4	54.4	100.0	76
<b>Region</b>					
Tigray	*	*	*	*	3
Afar	*	*	*	*	12
Amhara	(20.2)	(0.0)	(79.8)	(100.0)	31
Oromia	(45.6)	(2.1)	(52.3)	(100.0)	36
Somali	*	*	*	*	2
Benishangul Gumuz	*	*	*	*	6
SNNPR	*	*	*	*	14
Gambella	*	*	*	*	12
Harari	*	*	*	*	3
Addis Ababa	*	*	*	*	20
Dire Dawa	*	*	*	*	8
<b>Marital status</b>					
Never married	(26.0)	(6.1)	(68.0)	(100.0)	26
Married	38.1	1.3	60.6	100.0	87
Living together	*	*	*	*	12
Divorced or separated	*	*	*	*	15
Widowed	*	*	*	*	7
<b>Education</b>					
No education	*	*	*	*	10
Primary	39.9	0.0	60.1	100.0	71
Secondary	(33.7)	(6.2)	(60.1)	(100.0)	44
More than secondary	*	*	*	*	22
<b>Wealth quintile</b>					
Lowest	*	*	*	*	22
Second	(21.4)	(0.0)	(78.6)	(100.0)	26
Middle	(23.7)	(3.6)	(72.6)	(100.0)	39
Fourth	(39.3)	(0.5)	(60.2)	(100.0)	35
Highest	(42.5)	(4.4)	(53.2)	(100.0)	25

Table 8.3.A HIV treatment status: Men (continued)

Characteristic	Aware of HIV status			Total	Number
	Unaware of HIV status	Not on ART	On ART <sup>1</sup>		
<b>Religion</b>					
Ethiopian Orthodox	34.9	1.4	63.7	100.0	98
Muslim	(41.2)	(0.0)	(58.8)	(100.0)	25
Roman Catholic	*	*	*	*	0
Protestant	*	*	*	*	24
Other	*	*	*	*	0
<b>Ethnicity</b>					
Oromo	(34.0)	(0.0)	(66.0)	(100.0)	39
Amhara	30.4	2.1	67.6	100.0	69
Tigre	*	*	*	*	5
Afari	*	*	*	*	4
Somali	*	*	*	*	0
Welaita	*	*	*	*	2
Other	(51.8)	(4.7)	(43.5)	(100.0)	28
<b>Employment status (last 12 months)</b>					
Employed	36.0	0.2	63.9	100.0	91
Not employed	39.9	4.5	55.6	100.0	55
<b>Age</b>					
15-19	*	*	*	*	13
20-24	*	*	*	*	6
25-29	*	*	*	*	10
30-34	*	*	*	*	11
35-39	*	*	*	*	20
40-44	(40.2)	(0.0)	(59.8)	(100.0)	31
45-49	*	*	*	*	23
50-54	*	*	*	*	16
55-59	*	*	*	*	10
60-64	*	*	*	*	7
Total 15-24	*	*	*	*	19
Total 15-49	43.5	1.4	55.1	100.0	114
Total 50-64	(13.9)	(3.2)	(82.9)	(100.0)	33
Total 15-64	37.1	1.8	61.1	100.0	147

<sup>1</sup>Relates to Global AIDS Monitoring Indicator 1.2: People living with HIV on antiretroviral therapy and PEPFAR Indicator TX\_CURR\_NAT / SUBNAT: Percentage of adults and children receiving antiretroviral therapy.

**Weighted figures.**

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

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

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

**Table 8.3.B HIV treatment status: Women**

Percent distribution of HIV-positive women aged 15-64 years by self-reported HIV diagnosis and treatment status, by selected demographic characteristics, EPHIA 2017-18

Characteristic	Aware of HIV status			Total	Number
	Unaware of HIV status	Not on ART	On ART <sup>1</sup>		
<b>Urban area size</b>					
Small (≤50,000)	20.6	3.2	76.2	100.0	169
Large (>50,000)	23.6	5.8	70.6	100.0	262
<b>Region</b>					
Tigray	(9.0)	(0.0)	(91.0)	(100.0)	31
Afar	*	*	*	*	18
Amhara	16.8	0.0	83.2	100.0	80
Oromia	27.1	4.8	68.1	100.0	102
Somali	*	*	*	*	6
Benishangul Gumuz	*	*	*	*	13
SNNPR	(30.5)	(6.4)	(63.1)	(100.0)	35
Gambella	(41.4)	(4.0)	(54.6)	(100.0)	28
Harari	(31.3)	(0.0)	(68.7)	(100.0)	28
Addis Ababa	23.3	12.9	63.8	100.0	65
Dire Dawa	(16.9)	(0.0)	(83.1)	(100.0)	25
<b>Marital status</b>					
Never married	(31.5)	(6.7)	(61.8)	(100.0)	42
Married	23.7	3.7	72.6	100.0	162
Living together	*	*	*	*	16
Divorced or separated	18.8	3.5	77.7	100.0	114
Widowed	21.6	6.3	72.1	100.0	96
<b>Education</b>					
No education	17.6	5.4	76.9	100.0	99
Primary	24.1	3.3	72.6	100.0	204
Secondary	19.2	6.7	74.1	100.0	94
More than secondary	(39.6)	(6.2)	(54.2)	(100.0)	32
<b>Wealth quintile</b>					
Lowest	19.4	4.5	76.1	100.0	70
Second	18.9	1.7	79.4	100.0	71
Middle	20.5	2.9	76.5	100.0	101
Fourth	24.4	6.8	68.8	100.0	105
Highest	27.4	7.0	65.6	100.0	84

Table 8.3.B HIV treatment status: Women (continued)

Characteristic	Aware of HIV status			Total	Number
	Unaware of HIV status	Not on ART	On ART <sup>1</sup>		
<b>Religion</b>					
Ethiopian Orthodox	22.2	4.5	73.3	100.0	315
Muslim	12.7	5.6	81.7	100.0	52
Roman Catholic	*	*	*	*	1
Protestant	26.3	6.0	67.7	100.0	58
Other	*	*	*	*	3
<b>Ethnicity</b>					
Oromo	26.3	5.9	67.8	100.0	112
Amhara	21.3	3.9	74.8	100.0	210
Tigre	(15.1)	(2.0)	(82.9)	(100.0)	42
Afari	*	*	*	*	3
Somali	*	*	*	*	1
Welaita	*	*	*	*	9
Other	22.3	9.4	68.2	100.0	53
<b>Employment status (last 12 months)</b>					
Employed	25.1	5.1	69.8	100.0	191
Not employed	20.2	4.4	75.3	100.0	239
<b>Age</b>					
15-19	*	*	*	*	16
20-24	*	*	*	*	22
25-29	30.3	3.6	66.1	100.0	57
30-34	12.8	5.2	82.0	100.0	83
35-39	17.7	7.9	74.4	100.0	112
40-44	16.8	4.0	79.2	100.0	62
45-49	(29.6)	(0.0)	(70.4)	(100.0)	31
50-54	(25.7)	(4.3)	(70.1)	(100.0)	30
55-59	*	*	*	*	6
60-64	*	*	*	*	12
Total 15-24	(51.7)	(4.5)	(43.7)	(100.0)	38
Total 15-49	22.0	4.9	73.1	100.0	383
Total 50-64	(25.4)	(2.7)	(71.8)	(100.0)	48
Total 15-64	22.3	4.7	72.9	100.0	431

<sup>1</sup>Relates to Global AIDS Monitoring Indicator 1.2: People living with HIV on antiretroviral therapy and PEPFAR Indicator TX\_CURR\_NAT / SUBNAT: Percentage of adults and children receiving antiretroviral therapy.

Weighted figures.

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.

<sup>2</sup>Estimates based on a very small denominator (less than 25) have been suppressed with an asterisk.

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

Table 8.3.C HIV treatment status: Total

Characteristic	Aware of HIV status			Total	Number
	Unaware of HIV status	Not on ART	On ART <sup>1</sup>		
<b>Urban area size</b>					
Small (≤50,000)	24.8	2.1	73.1	100.0	240
Large (>50,000)	29.2	5.1	65.7	100.0	338
<b>Region</b>					
Tigray	(11.5)	(0.0)	(88.5)	(100.0)	34
Afar	(26.3)	(3.0)	(70.7)	(100.0)	30
Amhara	18.0	0.0	82.0	100.0	111
Oromia	33.3	3.9	62.8	100.0	138
Somali	*	*	*	*	8
Benishangul Gumuz	*	*	*	*	19
SNNPR	(34.7)	(4.1)	(61.2)	(100.0)	49
Gambella	(41.6)	(5.9)	(52.5)	(100.0)	40
Harari	(29.9)	(0.0)	(70.1)	(100.0)	31
Addis Ababa	31.8	10.5	57.7	100.0	85
Dire Dawa	(19.5)	(0.0)	(80.5)	(100.0)	33
<b>Marital status</b>					
Never married	29.0	6.4	64.7	100.0	68
Married	30.3	2.6	67.1	100.0	249
Living together	(26.9)	(3.5)	(69.6)	(100.0)	28
Divorced or separated	23.7	2.9	73.4	100.0	129
Widowed	22.2	5.9	71.9	100.0	103
<b>Education</b>					
No education	18.5	4.9	76.6	100.0	109
Primary	29.8	2.1	68.1	100.0	275
Secondary	24.7	6.5	68.8	100.0	138
More than secondary	37.9	3.2	58.8	100.0	54
<b>Wealth quintile</b>					
Lowest	35.2	3.1	61.8	100.0	92
Second	19.7	1.1	79.1	100.0	97
Middle	21.7	3.2	75.1	100.0	140
Fourth	29.3	4.7	66.0	100.0	140
Highest	31.7	6.2	62.1	100.0	109

Table 8.3.C HIV treatment status: Total (continued)

Characteristic	Aware of HIV status			Total	Number
	Unaware of HIV status	Not on ART	On ART <sup>1</sup>		
<b>Religion</b>					
Ethiopian Orthodox	26.1	3.5	70.4	100.0	413
Muslim	25.8	3.0	71.2	100.0	77
Roman Catholic	*	*	*	*	1
Protestant	32.9	6.2	60.9	100.0	82
Other	*	*	*	*	3
<b>Ethnicity</b>					
Oromo	29.1	3.8	67.1	100.0	151
Amhara	24.1	3.3	72.5	100.0	279
Tigre	(22.7)	(1.7)	(75.6)	(100.0)	47
Afari	*	*	*	*	7
Somali	*	*	*	*	1
Welaita	*	*	*	*	11
Other	35.6	7.3	57.1	100.0	81
<b>Employment status (last 12 months)</b>					
Employed	29.5	3.1	67.4	100.0	282
Not employed	25.1	4.5	70.4	100.0	294
<b>Age</b>					
15-19	(35.5)	(4.6)	(59.9)	(100.0)	29
20-24	(63.4)	(0.0)	(36.6)	(100.0)	28
25-29	43.5	2.7	53.8	100.0	67
30-34	19.5	6.5	74.0	100.0	94
35-39	20.6	6.4	73.0	100.0	132
40-44	26.6	2.3	71.1	100.0	93
45-49	32.1	0.0	67.9	100.0	54
50-54	(17.9)	(2.3)	(79.7)	(100.0)	46
55-59	*	*	*	*	16
60-64	*	*	*	*	19
Total 15-24	47.5	2.6	49.9	100.0	57
Total 15-49	28.5	3.9	67.7	100.0	497
Total 50-64	19.8	3.0	77.3	100.0	81
Total 15-64	27.2	3.7	69.0	100.0	578

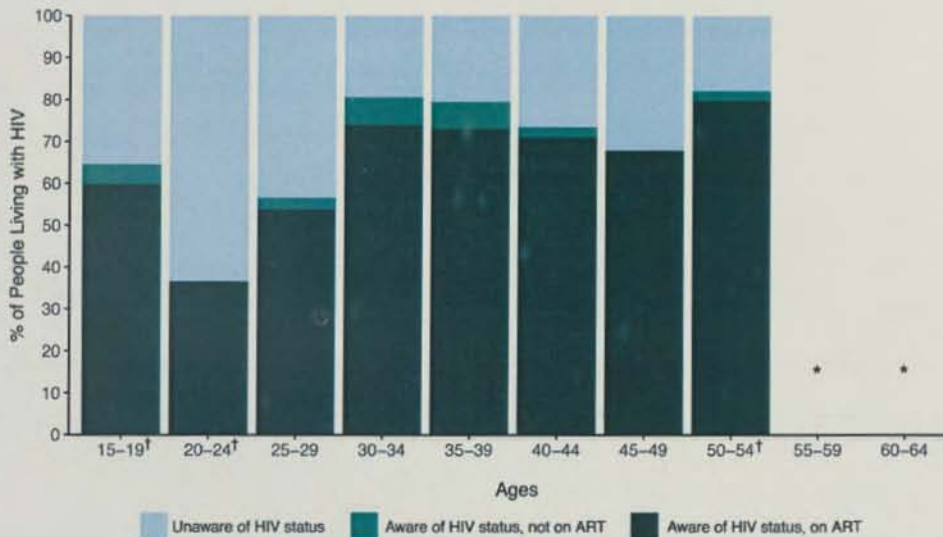
<sup>1</sup>Relates to Global AIDS Monitoring Indicator 1.2: People living with HIV on antiretroviral therapy and PEPFAR Indicator TX\_CURR\_NAT / SUBNAT: Percentage of adults and children receiving antiretroviral therapy.

**Weighted figures.**

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

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

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



**Figure 8.3.A**  
Proportion of HIV-positive adults aged 15-64 years reporting awareness of HIV status and antiretroviral therapy (ART) status, by age and sex, EPHIA 2017-2018

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

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

#### 8.4 CONCORDANCE OF SELF-REPORTED TREATMENT STATUS VERSUS LABORATORY ARV DATA

EPHIA determined the presence of ARVs in blood (efavirenz, lopinavir, tenofovir, and in some cases, nevirapine [see Appendix B]) as markers of first- and second-line regimens prescribed in the country at the time of the survey. Overall, ARVs were detected in 73.5% of HIV-positive adults: 65.5% of men and 77.4% of women (Tables 8.4.A, 8.4.B, and 8.4.C).

Among adults living with HIV who reported no previous HIV-positive diagnosis, 19.0% had ARVs detectable in their blood: 16.5% among men and 21.1% among women. ARVs were detected in 95.2% of adults who reported current use of ART: 93.7% of men and 95.8% of women. (Tables 8.4.A, 8.4.B, and 8.4.C).

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

Percent distribution of HIV-positive men aged 15-64 years by presence of detectable ARVs versus self-reported HIV treatment status, EPHIA 2017-18

Characteristic	ARV status		Total	Number
	Not detectable	Detectable		
<b>Self-reported treatment status</b>				
Not previously diagnosed	(83.5)	(16.5)	(100.0)	49
Previously diagnosed, not on ART	*	*	*	3
Previously diagnosed, on ART	6.3	93.7	100.0	95
Total 15-24	*	*	*	21
Total 15-49	38.6	61.4	100.0	120
Total 50-64	(18.8)	(81.2)	(100.0)	33
Total 15-64	34.5	65.5	100.0	153

Weighted figures.

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

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

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

Percent distribution of HIV-positive women aged 15-64 years by presence of detectable ARVs versus self-reported HIV treatment status, EPHIA 2017-18

Characteristic	ARV status		Total	Number
	Not detectable	Detectable		
<b>Self-reported treatment status</b>				
Not previously diagnosed	78.9	21.1	100.0	98
Previously diagnosed, not on ART	*	*	*	18
Previously diagnosed, on ART	4.2	95.8	100.0	315
Total 15-24	(40.2)	(59.8)	(100.0)	41
Total 15-49	23.3	76.7	100.0	404
Total 50-64	16.8	83.2	100.0	52
Total 15-64	22.6	77.4	100.0	456

Weighted figures.

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

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

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

Percent distribution of HIV-positive adults aged 15-64 years by presence of detectable ARVs versus self-reported HIV treatment status, EPHIA 2017-18

Characteristic	ARV status		Total	Number
	Not detectable	Detectable		
<b>Self-reported treatment status</b>				
Not previously diagnosed	81.0	19.0	100.0	147
Previously diagnosed, not on ART	*	*	*	21
Previously diagnosed, on ART	4.8	95.2	100.0	410
Total 15-24	42.6	57.4	100.0	62
Total 15-49	27.9	72.1	100.0	524
Total 50-64	17.7	82.3	100.0	85
Total 15-64	26.5	73.5	100.0	609

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

## 8.5 GAPS AND UNMET NEEDS

- The findings indicate that disclosure of HIV-positive status remains a challenge in urban Ethiopia. Further understanding of the reasons is required in order to design strategies and interventions to improve disclosure.

## 8.6 REFERENCES

1. World Health Organization. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection. World Health Organization. Geneva; 2016.
2. World Health Organization. Treat all: policy adoption and implementation status in countries. World Health Organization. Geneva; 2017.



## 9. VIRAL LOAD SUPPRESSION

### KEY FINDINGS

- Among all HIV-positive adults aged 15-49 years in urban Ethiopia, the proportion with VLS was 68.2%, while the proportion of adults 15-64 years with VLS was 70.1%: 66.8% among men and 71.7% among women.
- The proportion of HIV-positive adults with VLS ranged from 48.2% in young people (ages 15-24 years) to 80.2% in adults aged 45-54 years.
- The percentage of HIV-positive adults aged 15-64 years with VLS ranged from 56.7% in Gambella and 58.2% in Addis Ababa to 79.6% in Amhara.
- Among those who reported a previous HIV-positive diagnosis and current ART use, the proportion with VLS was 89.6%.

## 9.2 BACKGROUND

Viral load suppression is a key indicator of treatment success in HIV-positive individuals. For the purposes of EPHIA, VLS was defined as a VL less than 1,000 HIV RNA copies/mL of plasma. This chapter describes VLS among the population of HIV-positive adults by age, sex, region, and other demographic characteristics.

## 9.3 ADULT VIRAL LOAD SUPPRESSION BY AGE AND SEX

Among HIV-positive adults aged 15-49 years, the proportion with VLS was 68.2%. Among HIV-positive adults aged 15-64 years, the proportion with VLS was 70.1%, which ranged from 48.2% among young people to 81.7% among adults aged 50-64 years (Tables 9.3.A and 9.3.B, Figure 9.3.A).

Prevalence of VLS was 60.6% among men aged 15-49 years, while it was 90.2% among men aged 50-64 years (although the latter estimate was based on a small number denominator [25-49] and should be interpreted with caution. Among HIV-positive women, prevalence of VLS was 51.9% among older adolescent girls and young women (ages 15-24 years) (although this estimate was also based on a denominator of 25-49), while it was 74.4% among women aged 50 years and older. However, the differences in the proportion of women with VLS by age group were not statistically significant (Tables 9.3.A and 9.3.B).

**Table 9.3.A Viral load suppression by age (5-year age groups)**

Among HIV-positive persons aged 0-64 years, percentage with viral load suppression (VLS) (< 1,000 copies/mL), by sex and age, EPHIA 2017-18						
Age	Male		Female		Total	
	Percentage VLS <sup>1</sup>	Number	Percentage VLS <sup>1</sup>	Number	Percentage VLS <sup>1</sup>	Number
0-4	*	2	*	0	*	2
5-9	*	2	*	3	*	5
10-14	*	4	*	6	*	10
15-19	*	14	*	17	(52.4)	31
20-24	*	7	*	24	(42.3)	31
25-29	*	10	71.5	64	58.9	74
30-34	*	11	71.9	90	69.3	101
35-39	*	22	75.2	115	74.1	137
40-44	(61.0)	33	77.6	64	70.6	97
45-49	*	23	(64.8)	34	74.3	57
50-54	*	16	(79.9)	31	(88.9)	47
55-59	*	10	*	8	*	18
60-64	*	7	*	14	*	21

**Table 9.3.A Viral load suppression by age (5-year age groups) (continued)**

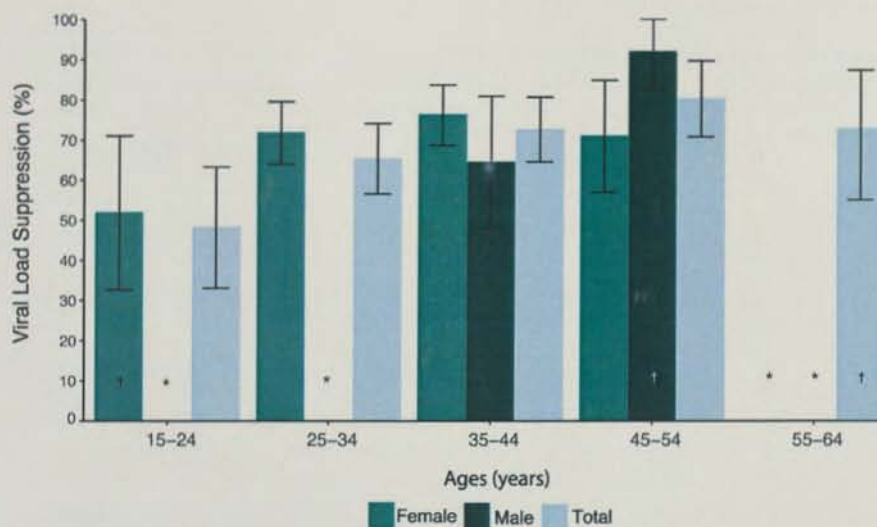
Among HIV-positive persons aged 0-64 years, percentage with viral load suppression (VLS) (< 1,000 copies/mL), by sex and age, EPHIA 2017-18						
Age	Male		Female		Total	
	Percentage VLS <sup>1</sup>	Number	Percentage VLS <sup>1</sup>	Number	Percentage VLS <sup>1</sup>	Number
Total 15-24	*	21	(51.9)	41	48.2	62
Total 15-49	60.6	120	71.4	408	68.2	528
Total 50-64	(90.2)	33	74.4	53	81.7	86
Total 15-64	66.8	153	71.7	461	70.1	614

<sup>1</sup>Relates to Global AIDS Monitoring Indicator 1.4: People living with HIV who have suppressed viral loads. Weighted figures.  
\*Estimates based on a very small denominator (less than 25) have been suppressed with an asterisk.  
() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

**Table 9.3.B Viral load suppression by age (10-to-15-year age groups)**

Among HIV-positive persons aged 0-64 years, percentage with viral load suppression (VLS) (< 1,000 copies/mL), by sex and age, EPHIA 2017-18						
Age	Male		Female		Total	
	Percentage VLS <sup>1</sup>	Number	Percentage VLS <sup>1</sup>	Number	Percentage VLS <sup>1</sup>	Number
0-14	*	8	*	9	*	17
15-24	*	21	(51.9)	41	48.2	62
25-34	*	21	71.8	154	65.3	175
35-44	64.4	55	76.1	179	72.5	234
45-54	(91.8)	39	70.8	65	80.2	104
55-64	*	17	*	22	(72.3)	39

<sup>1</sup>Relates to Global AIDS Monitoring Indicator 1.4: People living with HIV who have suppressed viral loads. Weighted figures.  
\*Estimates based on a very small denominator (less than 25) have been suppressed with an asterisk.  
() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.



**Figure 9.3.A**  
Proportion of viral load suppression (<1,000 copies/mL) among adults living with HIV, by age and sex, EPHIA 2017-2018

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

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

#### 9.4 ADULT VIRAL LOAD SUPPRESSION BY OTHER DEMOGRAPHIC CHARACTERISTICS

Overall, 70.1% of HIV-positive adults aged 15-64 years had VLS (66.8% among men and 71.7% among women). Among those who reported being previously diagnosed and on ART, the proportion with VLS was 89.6%. About one quarter (26.1%) of HIV-positive persons who reported that they were not previously diagnosed had VLS (Table 9.4.A).

More than one-half (60.0%) of never-married HIV-positive persons had VLS, while 73.0% of married, 81.0% of cohabitating persons, 69.2% of divorced or separated persons, and 69.7% of widowed persons had VLS. There were no observed differences in VLS among adults by marital status. (Table 9.4.A).

Table 9.4.A Viral load suppression by demographic characteristics

Characteristic	Male		Female		Total	
	Percentage VLS <sup>1</sup>	Number	Percentage VLS <sup>1</sup>	Number	Percentage VLS <sup>1</sup>	Number
<b>Self-reported diagnosis and treatment status</b>						
Not previously diagnosed	(24.3)	49	27.6	98	26.1	147
Previously diagnosed, not on ART	*	3	*	18	*	21
Previously diagnosed, on ART	94.9	95	87.4	315	89.6	410
Missing	*	6	(66.8)	30	(65.6)	36
<b>Urban area size</b>						
Small (≤50,000)	68.6	75	74.1	186	72.1	261
Large (>50,000)	64.9	78	69.9	275	68.4	353
<b>Region</b>						
Tigray	*	3	(70.1)	36	(70.2)	39
Afar	*	12	*	20	68.2	32
Amhara	(80.4)	33	79.1	85	79.6	118
Oromia	(60.6)	37	74.4	112	70.0	149
Somali	*	2	*	6	*	8
Benishangul Gumuz	*	6	*	14	*	20
SNNPR	*	14	(68.6)	35	(67.2)	49
Gambella	*	14	(61.4)	30	(56.7)	44
Harari	*	4	(60.6)	28	(64.6)	32
Addis Ababa	*	20	58.8	68	58.2	88
Dire Dawa	*	8	(70.2)	27	(71.7)	35
<b>Marital status</b>						
Never married	(58.4)	28	(61.5)	43	60.0	71
Married	69.1	88	76.1	168	73.0	256
Living together	*	12	*	17	(81.0)	29
Divorced or separated	*	17	70.5	127	69.2	144
Widowed	*	7	67.9	105	69.7	112

Table 9.4.A Viral load suppression by demographic characteristics (continued)

Among HIV-positive persons aged 15-64 years, percentage with viral load suppression (VLS) (< 1,000 copies/mL), by sex, self-reported diagnosis and treatment status, and selected demographic characteristics, EPHIA 2017-18

Characteristic	Male		Female		Total	
	Percentage VLS <sup>1</sup>	Number	Percentage VLS <sup>1</sup>	Number	Percentage VLS <sup>1</sup>	Number
<b>Education</b>						
No education	*	10	68.1	111	69.5	121
Primary	59.7	72	70.8	219	66.8	291
Secondary	(65.1)	45	77.6	96	72.8	141
More than secondary	(90.7)	25	(73.3)	33	83.0	58
<b>Wealth quintile</b>						
Lowest	*	23	68.9	80	58.9	103
Second	(73.5)	27	70.4	81	71.4	108
Middle	(76.6)	40	74.2	103	75.1	143
Fourth	(63.7)	36	68.4	111	66.9	147
Highest	(78.3)	27	77.0	86	77.4	113
<b>Religion</b>						
Ethiopian Orthodox	69.7	102	72.6	337	71.7	439
Muslim	(65.1)	26	79.2	57	72.9	83
Roman Catholic	*	0	*	1	*	1
Protestant	(51.3)	25	62.8	61	58.8	86
Other	*	0	*	3	*	3
<b>Ethnicity</b>						
Oromo	(65.3)	39	67.4	123	66.7	162
Amhara	76.1	74	75.0	220	75.3	294
Tigre	*	5	(68.4)	48	63.5	53
Afari	*	4	*	4	*	8
Somali	*	0	*	1	*	1
Welaita	*	2	*	9	*	11
Other	(53.2)	29	72.2	55	63.6	84
<b>Employment status (last 12 months)</b>						
Employed	76.5	93	73.5	205	74.7	298
Not employed	50.0	59	70.0	254	65.1	313
Total 15-24	*	21	(51.9)	41	48.2	62
Total 15-49	60.6	120	71.4	408	68.2	528
Total 50-64	(90.2)	33	74.4	53	81.7	86
Total 15-64	66.8	153	71.7	461	70.1	614

<sup>1</sup>Relates to Global AIDS Monitoring Indicator 1.4: People living with HIV who have suppressed viral loads.

Weighted figures.

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

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

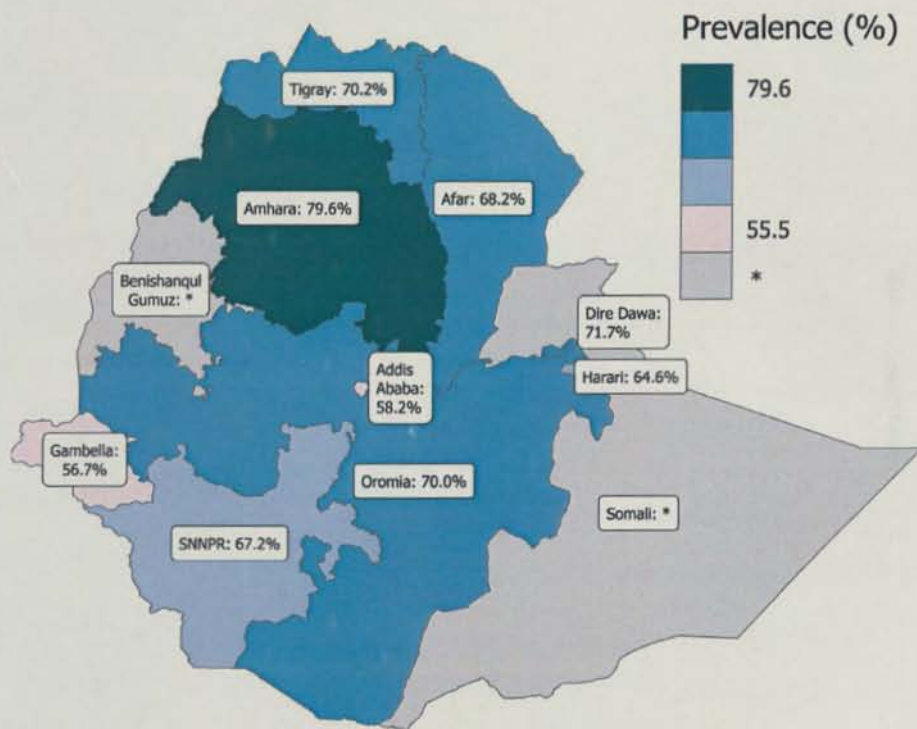
() Estimates based on a denominator of 25-49 are included in parentheses and should be interpreted with caution.

### 9.5 ADULT VIRAL LOAD SUPPRESSION BY REGION

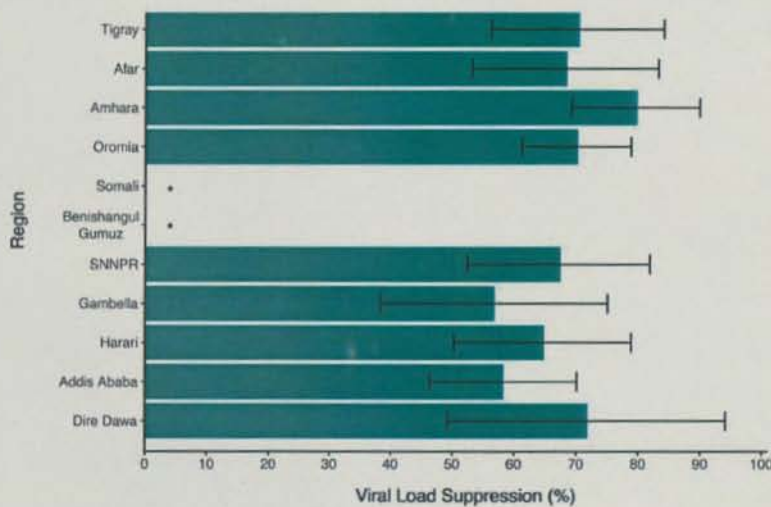
The percentage of HIV-positive adults aged 15-64 with VLS ranged from 56.7% in Gambella and 58.2% in Addis Ababa to 79.6% in Amhara. (Table 9.4.A ; Figures 9.5.A and 9.5.B).

**Figure 9.5.A**

Viral load suppression (<1000 copies/mL) among HIV-positive adults aged 15-64, by region, EPHIA 2017-2018



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



**Figure 9.5.B**  
Viral load suppression (<1000 copies/mL) among HIV-positive adults aged 15-64, by region, EPHIA 2017-2018

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

## 9.6 GAPS AND UNMET NEEDS

- About one third of the adults living with HIV in the urban areas of Ethiopia do not have VLS. VLS among young people was low (48.2%).
- Overall, VLS is high among people living with HIV who report that they know their HIV status and are taking ART, but among those who did not know their HIV status, it is very low. This shows the need to strengthen case finding through effective HIV testing strategies in order to improve VLS for the overall population.
- VLS among people living with HIV in some of the regions is low, indicating a need to improve case finding as well as adherence to treatment.



## 10. PROGRESS TOWARDS 90-90-90 TARGETS

### KEY FINDINGS

- **Diagnosed:** Based on self-report adjusted with ARV detection data, it is estimated that in urban Ethiopia, 79.0% of HIV positive adults (ages 15-64 years) know their HIV status (83.3% of HIV-positive women and 70.0% of HIV-positive men).
- **On treatment:** Based on self-report adjusted for ARV detection, it is estimated that among adults living with HIV who know their HIV status, 97.1% were receiving ART (96.4% of women and 98.9% men).
- **Viral load suppression:** Among adults living with HIV who reported ARV use or had detectable ARVs, 87.6% had VLS (86.1% of women and 91.1% of men).
- Based on EPHIA data, it is estimated there are approximately 384,000 adults living with HIV in urban Ethiopia. Among them, approximately 303,000 people were aware of their HIV positive status, 295,000 were on treatment, and 258,000 had VLS on treatment.

## 10.2 BACKGROUND

In order to bring the HIV epidemic under control, UNAIDS has set the ambitious target referred to as 90-90-90: By 2020, 90% of all people living with HIV will know their HIV status; 90% of all persons with diagnosed HIV infection will receive sustained ART; and 90% of all persons receiving ART will have VLS.<sup>1</sup>

The previous chapters on HIV testing and treatment provide results on coverage of HIV testing and treatment services, while VLS among all HIV-positive individuals is a measure of program impact, irrespective of knowledge of status or being on treatment. This chapter presents the status of the 90-90-90 indicators, which indicate signals of program performance. Awareness of HIV-positive status and receipt of treatment among those aware of their HIV-positive status are indicators of access to services. Measuring VLS among those aware of their HIV status and on treatment not only provides an indication of access to and retention in care, but also, when compared to VLS among all HIV-positive individuals, provides a measure of program success. VLS among all HIV-positive individuals of 73% (the product of 90% x 90% x 90%) or greater is an indication of successful testing and treatment services.

The 90-90-90 results in this chapter have been presented in two ways. First, Table 10.3.A measures the overall percentages among all adults living with HIV in the urban centers of Ethiopia of those who were aware of their status, those who were on treatment, and those who achieved VLS. Individuals were classified as 'aware' of their HIV-positive status if they reported their HIV-positive status or had detectable ARVs in their blood. Individuals were classified as 'on treatment' if they reported that they were taking ART or had detectable ARVs in their blood. Table 10.3.C presents the same overall percentages, only disaggregated by region.

Second, Table 10.3.B, which also uses both self-reported and ARV biomarker data for its estimates of the 90-90-90 results, reflects the outcomes only among those receiving care in HIV treatment programs in Ethiopia (thus this is called the *conditional* 90-90-90). Estimates for those aware of their status are the same as in Table 10.3.A. However, this table reports the percentages of those who are 'on treatment' only among those who were classified as aware (or diagnosed), and presents the percentage with VLS only among those who were determined to be on treatment. Therefore, this table presents the outcomes only of the people living with HIV who are participating in an HIV treatment program rather than among the entire population of people living with HIV in the urban centers of Ethiopia.

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

## 10.3 STATUS OF THE UNAIDS 90-90-90 TARGETS

*Overall 90-90-90 cascade based on self-reported awareness of HIV status and ART use and adjusted for detectable ARVs, and VLS (ARV-adjusted awareness of HIV-positive status):*

More than three quarters (79.0%) of HIV-positive adults in urban Ethiopia were aware of their HIV status: 83.3% of women and 70.0% of men. Among all the HIV-positive adults, 76.7% had detectable ARVs or reported current ART usage: 80.3% among women and 69.3% among men. Of all the HIV-positive population, only 67.2% had VLS: 69.2% among women and 63.1% among men. (Table 10.3.A).

**90-90-90 cascade based on self-reported awareness of HIV status and ART use and adjusted for detectable ARVs (ARV-adjusted awareness of HIV-positive status):**

Among HIV-positive adults, 79.0% were classified as aware according to combined self-reported awareness and detectable ARVs data (ARV-adjusted awareness). There was a significant difference by gender (70.0% of men [95% CI: 60.8%-79.2%] and 83.3% of women [95% CI: 79.7%-86.9%]) (Table 10.3.B, Figure 10.3.A). Similar or higher levels of ARV-adjusted awareness were observed for all age groups above 25 years of age. However, ARV-adjusted awareness of HIV-positive status was observed in only 63.0% of HIV-positive young people aged 15-24 years (Table 10.3.B).

**ARV-adjusted treatment status:** Based on either self-reported ART status or detection of ARVs, 97.1% of those with ARV-adjusted awareness status were classified as on ART (Table 10.3.B; Figure 10.3.A). This was similar across age groups ranging from 100.0% among young people (those aged 15-24 years) to 95.8% among adults aged 25-34 years. (Table 10.3.B).

**Viral suppression:** Among adults on ART (ARV-adjusted treatment status), 87.6% had VLS, ranging from 74.3% among young people to 92.6% among older adults aged 50-64 years. There were no significant differences in VLS among men and women and across age groups who were on ART (Table 10.3.B, Figure 10.3.A).

Based on EPHIA data, it is estimated there are approximately 384,000 adults living with HIV in urban Ethiopia (Table 5.3.C). Among them, approximately 303,000 people were aware of their HIV-positive status, 295,000 were on treatment, and 258,000 had suppressed viral loads (data not shown).

**90-90-90 cascade at regional level, based on self-reported awareness of HIV-positive status and treatment status, adjusted for detectable ARVs, and VLS (ARV-adjusted awareness of HIV-positive status):**

Among HIV-positive adults aged 15-64, awareness of ARV status ranged from 66.6% in Gambella to 89.5% in Tigray. The percentage of all HIV-positive adults with detectable ARVs or self-reported current ART usage ranged from 61.2% in Gambella to 89.5% in Tigray. The percentage of all HIV-positive adults who achieved VLS ranged from 54.1% in Gambella to 78.5% in Amhara (Table 10.3.C). (Note: Some of these estimates were based on a small number of observations [a denominator of 25 to 49], and should be interpreted with caution.)

**Table 10.3.A Adult 90-90-90 (self-reported antiretroviral [ARV] therapy [ART] status and laboratory ARV data; unconditional percentages)**

90-90-90 targets among all people living with HIV aged 15-64 years, by sex and age, EPHIA 2017-18						
Diagnosed						
Male		Female		Total		
Age	Percentage self-reported as HIV positive or with detectable ARVs <sup>1</sup>	Number	Percentage self-reported as HIV positive or with detectable ARVs <sup>1</sup>	Number	Percentage self-reported as HIV positive or with detectable ARVs <sup>1</sup>	Number
15-24	*	21	(63.0)	41	63.0	52
25-34	*	21	87.0	151	79.9	172
35-49	70.1	78	83.4	212	78.8	290
15-49	64.9	120	83.0	404	77.6	524
50-64	(89.5)	33	85.8	52	87.5	35
15-64	70.0	153	83.3	456	79.0	609
On Treatment						
Male		Female		Total		
Age	Percentage self-reported as currently on ART or with detectable ARVs <sup>2</sup>	Number	Percentage self-reported as currently on ART or with detectable ARVs <sup>2</sup>	Number	Percentage self-reported as currently on ART or with detectable ARVs <sup>2</sup>	Number
15-24	*	21	(63.0)	41	63.0	62
25-34	*	21	82.9	151	76.5	172
35-49	69.9	78	80.5	212	76.9	290
15-49	64.8	120	79.9	404	75.4	524
50-64	(86.2)	33	83.2	52	84.7	85
15-64	69.3	153	80.3	456	76.7	609
Viral load suppression (VLS) on Treatment						
Male		Female		Total		
Age	Percentage with VLS <sup>3</sup>	Number	Percentage with VLS <sup>3</sup>	Number	Percentage with VLS <sup>3</sup>	Number
15-24	*	21	(49.4)	41	46.8	62
25-34	*	21	69.6	151	63.4	172
35-49	66.2	78	71.0	212	69.3	290
15-49	57.3	120	68.8	404	65.3	524
50-64	(85.5)	33	72.1	52	78.4	85
15-64	63.1	153	69.2	456	67.2	609

<sup>1</sup>Relates to Global AIDS Monitoring Indicator (GAM) 1.1: People living with HIV who know their HIV status and PEPFAR Indicator DIAGNOSED\_NAT: The percentage of adults and children living with HIV who know their status (have been diagnosed);

<sup>2</sup>Relates to GAM 1.2: People living with HIV on antiretroviral therapy and PEPFAR Indicator TX\_CURR\_NAT / SUBNAT: Percentage of adults and children receiving antiretroviral therapy; <sup>3</sup>Relates to GAM 1.4: People living with HIV who have suppressed viral loads and PEPFAR VL\_SUPPRESSION\_NAT: Percentage of people living with HIV on ART with a suppressed viral load

Weighted figures

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

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

**Table 10.3.B Adult 90-90-90 (self-reported antiretroviral [ARV] therapy [ART] status and laboratory ARV data; conditional percentages)**

90-90-90 targets among people living with HIV aged 15-64 years, by sex and age, EPHIA 2017-18						
Diagnosed						
Age	Male		Female		Total	
	Percentage self-reported as HIV positive or with detectable ARVs <sup>1</sup>	Number	Percentage self-reported as HIV positive or with detectable ARVs <sup>1</sup>	Number	Percentage self-reported as HIV positive or with detectable ARVs <sup>1</sup>	Number
15-24	*	21	(63.0)	41	63.0	62
25-34	*	21	87.0	151	79.9	172
35-49	70.1	78	83.4	212	78.8	290
15-49	64.9	120	83.0	404	77.6	524
50-64	(89.5)	33	85.8	52	87.5	85
15-64	70.0	153	83.3	456	79.0	609
On Treatment Among Those Diagnosed						
Age	Male		Female		Total	
	Percentage self-reported as currently on ART or with detectable ARVs <sup>2</sup>	Number	Percentage self-reported as currently on ART or with detectable ARVs <sup>2</sup>	Number	Percentage self-reported as currently on ART or with detectable ARVs <sup>2</sup>	Number
15-24	*	12	(100.0)	27	(100.0)	39
25-34	*	12	95.3	129	95.8	141
35-49	99.7	58	96.5	177	97.5	235
15-49	99.8	82	96.3	333	97.2	415
50-64	(96.4)	30	(97.1)	45	96.7	75
15-64	98.9	112	96.4	378	97.1	490
Viral Load Suppression (VLS) Among Those on Treatment						
Age	Male		Female		Total	
	Percentage with VLS <sup>3</sup>	Number	Percentage with VLS <sup>3</sup>	Number	Percentage with VLS <sup>3</sup>	Number
15-24	*	12	(78.4)	27	(74.3)	39
25-34	*	12	84.0	123	82.8	135
35-49	94.6	57	88.2	172	90.2	229
15-49	88.4	81	86.0	322	86.6	403
50-64	(99.1)	29	(86.7)	44	92.6	73
15-64	91.1	110	86.1	366	87.6	476

<sup>1</sup>Relates to Global AIDS Monitoring Indicator (GAM) 1.1: People living with HIV who know their HIV status and PEPFAR Indicator DIAGNOSED\_NAT. The percentage of adults and children living with HIV who know their status (have been diagnosed). <sup>2</sup>Relates to GAM 1.2: People living with HIV on antiretroviral therapy and PEPFAR Indicator TX\_CURR\_NAT / SUBNAT: Percentage of adults and children receiving antiretroviral therapy. <sup>3</sup>Relates to GAM 1.4: People living with HIV who have suppressed viral loads and PEPFAR VL\_SUPPRESSION\_NAT: Percentage of people living with HIV on ART with a suppressed viral load

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

**Table 10.3.C Adult 90-90-90 (self-reported antiretroviral [ARV] therapy [ART] status and laboratory ARV data; overall percentages for regions)**

90-90-90 targets among people living with HIV aged 15-64 years, by sex, region, and urban area size, EPHIA 2017-18						
Age	Diagnosed					
	Male		Female		Total	
	Percentage self-reported as HIV positive or with detectable ARVs <sup>1</sup>	Number	Percentage self-reported as HIV positive or with detectable ARVs <sup>1</sup>	Number	Percentage self-reported as HIV positive or with detectable ARVs <sup>1</sup>	Number
<b>Urban area size</b>						
Small (≤50,000)	71.4	75	85.5	185	80.4	260
Large (>50,000)	68.6	78	81.7	271	77.8	349
<b>Region</b>						
Tigray	*	3	(91.8)	35	(89.5)	38
Afar	*	12	*	20	(75.1)	32
Amhara	(83.7)	33	86.1	85	85.2	118
Oromia	(60.8)	37	83.3	111	76.0	148
Somali	*	2	*	6	*	8
Benishangul Gumuz	*	6	*	14	*	20
SNNPR	*	14	(74.1)	35	(73.3)	49
Gambella	*	14	(64.6)	30	(66.6)	44
Harari	*	4	(71.1)	28	(73.3)	32
Addis Ababa	*	20	80.9	66	74.8	86
Dire Dawa	*	8	(88.0)	26	(83.9)	34
<b>On Treatment</b>						
Age	Male		Female		Total	
	Percentage self-reported as currently on ART or with detectable ARVs <sup>2</sup>	Number	Percentage self-reported as currently on ART or with detectable ARVs <sup>2</sup>	Number	Percentage self-reported as currently on ART or with detectable ARVs <sup>2</sup>	Number
	Percentage self-reported as currently on ART or with detectable ARVs <sup>2</sup>	Number	Percentage self-reported as currently on ART or with detectable ARVs <sup>2</sup>	Number	Percentage self-reported as currently on ART or with detectable ARVs <sup>2</sup>	Number
<b>Urban area size</b>						
Small (≤50,000)	71.2	75	82.7	185	78.6	260
Large (>50,000)	67.3	78	78.4	271	75.1	349
<b>Region</b>						
Tigray	*	3	(91.8)	35	(89.5)	38
Afar	*	12	*	20	(75.1)	32
Amhara	(83.7)	33	86.1	85	85.2	118
Oromia	(58.8)	37	78.9	111	72.4	148
Somali	*	2	*	6	*	8
Benishangul Gumuz	*	6	*	14	*	20

**Table 10.3.C Adult 90-90-90 (self-reported antiretroviral [ARV] therapy [ART] status and laboratory ARV data; overall percentages for regions) (continued)**

90-90-90 targets among people living with HIV aged 15-64 years, by sex, region, and urban area size, EPHIA 2017-18						
Region	Diagnosed					
	Male		Female		Total	
	Percentage self-reported as HIV positive or with detectable ARVs <sup>1</sup>	Number	Percentage self-reported as HIV positive or with detectable ARVs <sup>1</sup>	Number	Percentage self-reported as HIV positive or with detectable ARVs <sup>1</sup>	Number
SNNPR	*	14	(67.7)	35	(69.2)	49
Gambella	*	14	(60.8)	30	(61.2)	44
Harari	*	4	(71.1)	28	(73.3)	32
Addis Ababa	*	20	75.7	66	71.2	86
Dire Dawa	*	8	(88.0)	26	(83.9)	34
Viral Load Suppression (VLS) on Treatment						
Urban area size	Male		Female		Total	
	Percentage with VLS <sup>3</sup>	Number	Percentage with VLS <sup>3</sup>	Number	Percentage with VLS <sup>3</sup>	Number
Small (≤50,000)	65.0	75	71.4	185	69.1	260
Large (>50,000)	61.2	78	67.4	271	65.6	349
Region						
Tigray	*	3	(70.0)	35	(70.1)	38
Afar	*	12	*	20	(64.9)	32
Amhara	(77.5)	33	79.1	85	78.5	118
Oromia	(55.1)	37	69.6	111	64.9	148
Somali	*	2	*	6	*	8
Benishangul Gumuz	*	6	*	14	*	20
SNNPR	*	14	(56.0)	35	(59.0)	49
Gambella	*	14	(57.1)	30	(54.1)	44
Harari	*	4	(60.6)	28	(64.6)	32
Addis Ababa	*	20	59.8	66	57.1	86
Dire Dawa	*	8	(73.3)	26	(73.9)	34

<sup>1</sup>Relates to Global AIDS Monitoring Indicator (GAM) 1.1: People living with HIV who know their HIV status and PEPFAR Indicator DIAGNOSED\_NAT: The percentage of adults and children living with HIV who know their status (have been diagnosed).

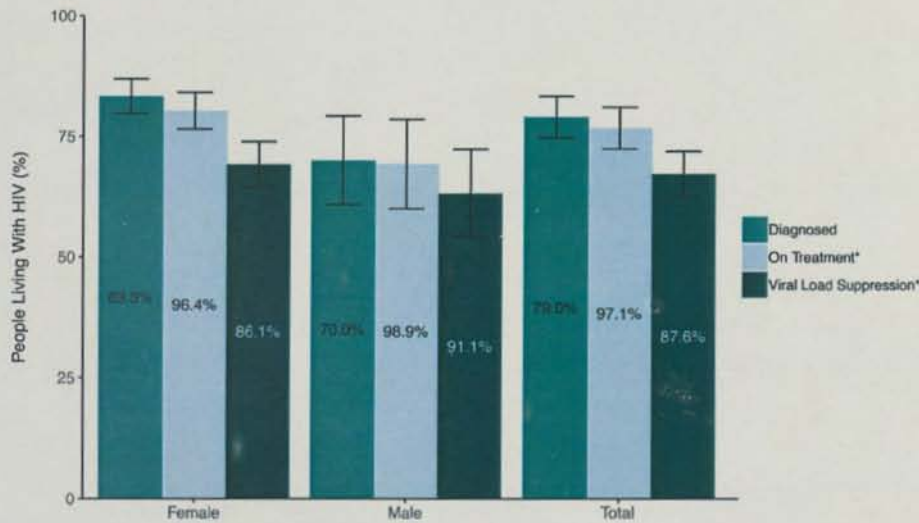
<sup>2</sup>Relates to GAM 1.2: People living with HIV on antiretroviral therapy and PEPFAR Indicator TX\_CURR\_NAT / SUBNAT: Percentage of adults and children receiving antiretroviral therapy.

<sup>3</sup>Relates to GAM 1.4: People living with HIV who have suppressed viral loads and PEPFAR VL\_SUPPRESSION\_NAT: Percentage of people living with HIV on ART with a suppressed viral load.

Weighted figures.

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

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



**Figure 10.3.A**  
 Adult 90-90-90 (adjusted for laboratory antiretroviral data among adults aged 15-64 years), EPHIA 2017-2018

In the antiretroviral (ARV)-adjusted 90-90-90, adults (ages 15-64 years) are classified as 'Aware' or 'Diagnosed' if they reported knowing their HIV-positive status before testing HIV seropositive in EPHIA or had detectable ARVs in their blood. Adults are classified as 'On Treatment' if they reported that they were on treatment or if they had detectable ARVs in their blood. \*Inset numbers are conditional proportions.

### 10.4 GAPS AND UNMET NEEDS

- A major gap identified in EPHIA is low awareness of HIV status in those living with HIV, especially among young people and adult men in general. More interventions may be needed to improve case detection, especially among young people and adult men.

### 10.5 REFERENCES

1. UNAIDS. 90-90-90. An ambitious treatment target to help end the AIDS epidemic. UNAIDS, 2014.



# 11. CLINICAL PERSPECTIVES ON PEOPLE LIVING WITH HIV

## KEY FINDINGS

- Among adults (ages 15-64 years) living with HIV, 35.8% (45.6% of men and 31.1% of women) had immunosuppression with CD4 count less than 350 cells per microliter ( $\mu\text{L}$ ). The median CD4 count among all HIV-positive adults was 432 (IQR 277-594) cells/ $\mu\text{L}$ . The median CD4 count among adults who tested HIV positive in EPHIA but reported that they had not been previously diagnosed was 352 (IQR 217-480) cells/ $\mu\text{L}$ .
- Among adults who reported that they were unaware of their HIV-positive status, 22.0% had severe immunosuppression—a CD4 count less than 200 cells/ $\mu\text{L}$  (16.9% of men and 26.5% of women).

## 11.2 BACKGROUND

The quality of HIV care is based on key principles of accessibility, efficiency, and safety. As countries implement treatment for all people living with HIV, ensuring a sustainable health system that is people-centered and innovative requires diligent monitoring and responsiveness (WHO 2016). Indicators such as CD4 count at diagnosis and during lifelong ART can provide evidence of program coverage, the success in reaching vulnerable populations, and quality of care. The distribution of CD4 counts also reflects population health, and the potential impact of HIV on mortality and healthcare costs, since persons with severe immunosuppression tend to have frequent opportunistic infections, hospitalizations, and a higher likelihood of severe illnesses and death. Ethiopia has committed to HIV epidemic control under the Fast Track strategy. The higher the median CD4 count, the healthier the population and the better the HIV treatment outcome. Finally, the measurement of transmitted and acquired drug resistance allows optimization of national ART guidelines including second- and third-line therapies. EPHIA provides a unique opportunity to gauge progress in the expansion of HIV clinical services in Ethiopia, as well as identify gaps and future challenges. In this survey, CD4 enumeration was performed using POC diagnostics. This was also the first time that data on transmitted drug resistance has been collected at a population level in Ethiopia.

## 11.3 CD4 COUNTS AND IMMUNOSUPPRESSION

Among all HIV-positive adults, 35.8% were immunosuppressed with a CD4 count of less than 350 cells/ $\mu$ L. Nearly half (45.6%) of HIV-positive men were immunosuppressed compared to 31.1% of women. The median CD4 count was 432 cells/ $\mu$ L in HIV-positive adults (370 cells/ $\mu$ L in men and 462 cells/ $\mu$ L in women) (Table 11.3.A).

Among adults aged 15-49 years, the percentage of immunosuppressed persons was higher among men (49.2%) than among women (31.4%) (Table 11.3.A). Among HIV-positive adults who were unaware of their status (that is, they reported that they were HIV negative or never tested), the median CD4 count was 352 cells/ $\mu$ L—close to half (47.8%) had a CD4 count less than 350 cells/ $\mu$ L (46.9% of men and 48.6% of women). Among HIV-positive adults who were on ART, the median CD4 count was 457 cells/ $\mu$ L—and 30.9% had a CD4 count less than 350 cells/ $\mu$ L (45.3% of men and 25.0% of women) (Table 11.3.A, Figure 11.3.A).

Table 11.3.A Median CD4 count and prevalence of immunosuppression

Characteristic	Male			Female			Total		
	Median (Q1, Q3)	Percentage < 350 cells/ $\mu$ L	Number	Median (Q1, Q3)	Percentage < 350 cells/ $\mu$ L	Number	Median (Q1, Q3)	Percentage < 350 cells/ $\mu$ L	Number
<b>Self-reported diagnosis and treatment status</b>									
Not previously diagnosed	350 (233, 488)	(46.9)	49	357 (197, 467)	48.6	98	352 (217, 480)	47.8	147
Previously diagnosed, not on ART	*	*	3	*	*	18	*	*	21
Previously diagnosed, on ART	372 (230, 480)	45.3	95	499 (348, 697)	25.0	315	457 (315, 628)	30.9	410
Missing	*	*	6	460 (209, 671)	(32.3)	30	508 (209, 716)	(31.8)	36
<b>Urban area size</b>									
Small ( $\leq$ 50,000)	379 (261, 483)	45.5	75	470 (317, 651)	30.4	186	445 (279, 576)	35.8	261
Large ( $>$ 50,000)	355 (223, 493)	45.7	78	449 (303, 641)	31.7	275	420 (268, 604)	35.8	353
<b>Region</b>									
Tigray	*	*	3	432 (295, 535)	(34.1)	36	414 (237, 490)	(41.3)	39
Afar	*	*	12	*	*	20	358 (227, 629)	(48.7)	32
Amhara	368 (266, 479)	(43.4)	33	492 (342, 703)	24.8	85	447 (288, 612)	31.6	118
Oromia	386 (205, 490)	(44.0)	37	455 (328, 606)	29.0	112	450 (309, 579)	33.8	149
Somali	*	*	2	*	*	6	*	*	8
Benishangul Gumuz	*	*	6	*	*	14	*	*	20
SNNPR	*	*	14	525 (313, 713)	(26.7)	35	458 (277, 659)	(33.9)	49
Gambella	*	*	14	465 (269, 670)	(30.7)	30	388 (268, 596)	(41.9)	44
Harari	*	*	4	538 (215, 692)	(39.0)	28	517 (224, 661)	(40.1)	32
Addis Ababa	*	*	20	399 (221, 564)	40.5	68	386 (225, 544)	41.2	88
Dire Dawa	*	*	8	401 (236, 611)	(43.8)	27	390 (266, 527)	(38.4)	35
<b>Marital status</b>									
Never married	358 (204, 426)	(43.1)	28	475 (212, 660)	(33.8)	43	390 (206, 591)	38.2	71
Married	375 (274, 486)	44.8	88	478 (360, 687)	24.3	168	446 (289, 616)	33.6	256
Living together	*	*	12	*	*	17	423 (316, 520)	(35.7)	29
Divorced or separated	*	*	17	446 (316, 588)	32.9	127	440 (279, 582)	37.0	144
Widowed	*	*	7	421 (233, 649)	38.2	105	403 (237, 635)	38.3	112
<b>Education</b>									
No education	*	*	10	450 (330, 662)	29.7	111	447 (318, 661)	31.7	121
Primary	349 (227, 492)	49.1	72	455 (291, 615)	33.9	219	431 (264, 584)	39.3	291
Secondary	379 (200, 475)	(42.3)	45	479 (299, 702)	28.3	96	419 (275, 561)	33.7	141
More than secondary	384 (313, 450)	(35.6)	25	426 (312, 596)	(28.3)	33	406 (317, 521)	32.4	58

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

Among HIV-positive persons aged 15-64 years, median (quartile 1, quartile 3 [Q1, Q3]) CD4 count and percentage with immunosuppression (< 350 cells/ $\mu$ L), by sex, self-reported diagnosis and ART status, and selected demographic characteristics, EPHIA 2017-18

Characteristic	Male			Female			Total		
	Median (Q1, Q3)	Percentage < 350 cells/ $\mu$ L	Number	Median (Q1, Q3)	Percentage < 350 cells/ $\mu$ L	Number	Median (Q1, Q3)	Percentage < 350 cells/ $\mu$ L	Number
<b>Wealth quintile</b>									
Lowest	*	*	23	394 (215, 592)	43.2	80	362 (211, 520)	47.0	103
Second	336 (220, 443)	(58.0)	27	446 (256, 660)	32.9	81	401 (246, 609)	41.1	108
Middle	379 (210, 466)	(45.7)	40	450 (303, 643)	34.6	103	408 (267, 589)	38.7	143
Fourth	390 (272, 529)	(44.3)	36	483 (360, 638)	23.6	111	477 (292, 616)	30.3	147
Highest	409 (343, 480)	(23.4)	27	473 (366, 640)	23.3	86	450 (352, 594)	23.3	113
<b>Religion</b>									
Ethiopian Orthodox	371 (223, 484)	43.5	102	454 (307, 633)	29.9	337	437 (277, 595)	34.0	439
Muslim	280 (173, 375)	(67.9)	26	535 (318, 711)	28.0	57	374 (268, 563)	45.6	83
Roman Catholic	*	*	0	*	*	1	*	*	1
Protestant	436 (301, 485)	(28.5)	25	452 (217, 608)	42.1	61	447 (272, 579)	37.4	86
Other	*	*	0	*	*	3	*	*	3
<b>Ethnicity</b>									
Oromo	423 (296, 489)	(37.8)	39	438 (263, 595)	37.2	123	426 (288, 573)	37.4	162
Amhara	354 (221, 473)	46.2	74	476 (326, 687)	27.3	220	445 (278, 606)	33.3	294
Tigre	*	*	5	435 (326, 632)	(34.3)	48	424 (261, 634)	38.9	53
Afari	*	*	4	*	*	4	*	*	8
Somali	*	*	0	*	*	1	*	*	1
Welaita	*	*	2	*	*	9	*	*	11
Other	316 (227, 454)	(49.1)	29	529 (296, 690)	29.4	55	417 (264, 577)	38.3	84
<b>Employment status (last 12 months)</b>									
Employed	372 (234, 488)	43.2	93	446 (290, 620)	31.9	205	413 (261, 576)	36.4	298
Not employed	349 (222, 480)	48.3	59	467 (319, 670)	30.7	254	446 (289, 610)	35.1	313

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

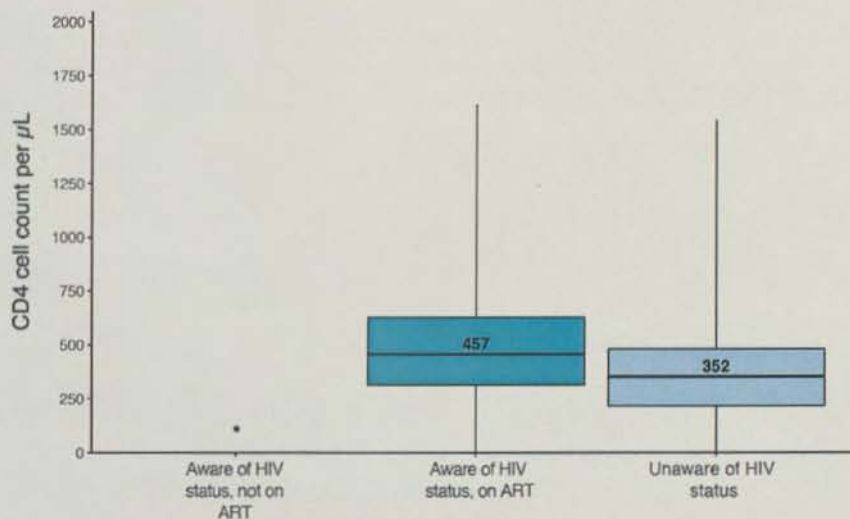
Among HIV-positive persons aged 15-64 years, median (quartile 1, quartile 3 [Q1, Q3]) CD4 count and percentage with immunosuppression (< 350 cells/ $\mu$ L), by sex, self-reported diagnosis and ART status, and selected demographic characteristics, EPHIA 2017-18

Characteristic	Male			Female			Total		
	Median (Q1, Q3)	Percentage < 350 cells/ $\mu$ L	Number	Median (Q1, Q3)	Percentage < 350 cells/ $\mu$ L	Number	Median (Q1, Q3)	Percentage < 350 cells/ $\mu$ L	Number
<b>Age</b>									
15-19	*	*	14	*	*	17	438 (279, 593)	(29.4)	31
20-24	*	*	7	*	*	24	493 (262, 679)	(32.6)	31
25-29	*	*	10	446 (297, 584)	28.0	64	399 (267, 572)	36.1	74
30-34	*	*	11	450 (220, 715)	36.3	90	447 (215, 666)	38.2	101
35-39	*	*	22	449 (307, 634)	30.4	115	430 (289, 613)	34.6	137
40-44	303 (212, 482)	(50.9)	33	442 (332, 628)	31.2	64	403 (271, 511)	39.4	97
45-49	*	*	23	472 (309, 619)	(29.4)	34	425 (276, 606)	38.9	57
50-54	*	*	16	479 (332, 542)	(27.6)	31	448 (330, 548)	(26.9)	47
55-59	*	*	10	*	*	8	*	*	18
60-64	*	*	7	*	*	14	*	*	21
Total 15-24	*	*	21	481 (293, 601)	(29.6)	41	470 (275, 602)	30.7	62
Total 15-49	350 (221, 488)	49.2	120	451 (307, 645)	31.4	408	433 (274, 595)	36.7	528
Total 50-64	372 (285, 462)	(32.2)	33	484 (329, 606)	28.9	53	427 (322, 563)	30.4	86
Total 15-64	370 (225, 487)	45.6	153	462 (308, 645)	31.1	461	432 (277, 594)	35.8	614

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

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

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



**Figure 11.3.A**  
CD4 count distribution among HIV-positive adults aged 15-64 years, by antiretroviral therapy status, EPHIA 2017-2018

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

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

#### 11.4 LATE HIV DIAGNOSIS

Among HIV-positive adults who reported as HIV negative or never tested and who had no detectable ARV in their blood, 52.4% had a CD4 count less than 350 cells/ $\mu\text{L}$  (52.6% of men and 52.3% of women). Among the same group of adults, 22.0% had a CD4 count less than 200 cells/ $\mu\text{L}$  (16.9% of men and 26.5% of women). (Note: The estimates for men are based on a small denominator between 25-49 and should be interpreted with caution) (Table 11.4.A).

Table 11.4.A Late HIV diagnosis

Among persons aged 15-64 years who tested HIV positive in the PHIA survey but reported HIV negative, percentage who had a CD4 cell count < 200 cells/ $\mu$ L and < 350 cells/ $\mu$ L by sex and selected demographic characteristics, EPHIA 2017-18

Characteristic	Male			Female			Total		
	Percentage < 200 cells/ $\mu$ L <sup>1</sup>	Percentage < 350 cells/ $\mu$ L <sup>1</sup>	Number	Percentage < 200 cells/ $\mu$ L <sup>1</sup>	Percentage < 350 cells/ $\mu$ L <sup>1</sup>	Number	Percentage < 200 cells/ $\mu$ L <sup>1</sup>	Percentage < 350 cells/ $\mu$ L <sup>1</sup>	Number
<b>Urban area size</b>									
Small ( $\leq$ 50,000)	*	*	18	(35.2)	(56.0)	27	(28.9)	(50.5)	45
Large ( $>$ 50,000)	*	*	23	21.1	50.0	51	16.8	53.8	74
<b>Region</b>									
Tigray	*	*	1	*	*	3	*	*	4
Afar	*	*	4	*	*	4	*	*	8
Amhara	*	*	4	*	*	11	*	*	15
Oromia	*	*	12	*	*	17	(22.6)	(43.5)	29
Somali	*	*	0	*	*	0	*	*	0
Benishangul Gumuz	*	*	1	*	*	0	*	*	1
SNNPR	*	*	4	*	*	9	*	*	13
Gambella	*	*	4	*	*	10	*	*	14
Harari	*	*	1	*	*	8	*	*	9
Addis Ababa	*	*	8	*	*	13	*	*	21
Dire Dawa	*	*	2	*	*	3	*	*	5
<b>Marital status</b>									
Never married	*	*	8	*	*	10	*	*	18
Married	*	*	24	(32.6)	(51.0)	28	20.5	49.5	52
Living together	*	*	3	*	*	2	*	*	5
Divorced or separated	*	*	5	*	*	21	(23.0)	(47.4)	26
Widowed	*	*	1	*	*	16	*	*	17
<b>Education</b>									
No education	*	*	4	*	*	15	*	*	19
Primary	*	*	21	(19.7)	(57.2)	37	17.6	57.8	58
Secondary	*	*	10	*	*	14	*	*	24
More than secondary	*	*	6	*	*	11	*	*	17
<b>Wealth quintile</b>									
Lowest	*	*	12	*	*	8	*	*	20
Second	*	*	4	*	*	13	*	*	17
Middle	*	*	7	*	*	16	*	*	23
Fourth	*	*	12	*	*	21	(23.2)	(57.1)	33
Highest	*	*	6	*	*	20	(17.7)	(35.3)	26

Table 11.4.A Late HIV diagnosis (continued)

Among persons aged 15-64 years who tested HIV positive in the PHIA survey but reported HIV negative, percentage who had a CD4 cell count < 200 cells/ $\mu$ L and < 350 cells/ $\mu$ L by sex and selected demographic characteristics, EPHIA 2017-18

Characteristic	Male			Female			Total		
	Percentage < 200 cells/ $\mu$ L <sup>1</sup>	Percentage < 350 cells/ $\mu$ L <sup>1</sup>	Number	Percentage < 200 cells/ $\mu$ L <sup>1</sup>	Percentage < 350 cells/ $\mu$ L <sup>1</sup>	Number	Percentage < 200 cells/ $\mu$ L <sup>1</sup>	Percentage < 350 cells/ $\mu$ L <sup>1</sup>	Number
<b>Religion</b>									
Ethiopian Orthodox	(16.1)	(50.0)	26	28.2	51.5	57	23.1	50.9	83
Muslim	*	*	10	*	*	6	*	*	16
Roman Catholic	*	*	0	*	*	0	*	*	0
Protestant	*	*	5	*	*	11	*	*	16
Other	*	*	0	*	*	2	*	*	2
<b>Ethnicity</b>									
Oromo	*	*	10	*	*	20	(18.8)	(46.8)	30
Amhara	*	*	14	(33.0)	(48.5)	35	(24.7)	(49.9)	49
Tigre	*	*	3	*	*	6	*	*	9
Afari	*	*	2	*	*	0	*	*	2
Somali	*	*	0	*	*	0	*	*	0
Welaita	*	*	1	*	*	4	*	*	5
Other	*	*	11	*	*	13	*	*	24
<b>Employment status (last 12 months)</b>									
Employed	*	*	24	(25.9)	(53.0)	40	16.7	49.8	64
Not employed	*	*	17	(27.2)	(51.5)	38	28.1	55.4	55
<b>Age</b>									
15-19	*	*	4	*	*	4	*	*	8
20-24	*	*	5	*	*	10	*	*	15
25-29	*	*	5	*	*	10	*	*	15
30-34	*	*	4	*	*	12	*	*	16
35-39	*	*	5	*	*	16	*	*	21
40-44	*	*	10	*	*	12	*	*	22
45-49	*	*	5	*	*	7	*	*	12
50-54	*	*	1	*	*	4	*	*	5
55-59	*	*	1	*	*	1	*	*	2
60-64	*	*	1	*	*	2	*	*	3
Total 15-24	*	*	9	*	*	14	*	*	23
Total 15-49	(16.0)	(54.5)	38	25.6	52.1	71	21.1	53.2	109
Total 50-64	*	*	3	*	*	7	*	*	10
Total 15-64	(16.9)	(52.6)	41	26.5	52.3	78	22.0	52.4	119

<sup>1</sup>Relates to Global AIDS Monitoring Indicator 1.5: Late HIV diagnosis.

**Weighted figures.**

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

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

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

## 11.5 SELF-REPORTED RETENTION ON ANTIRETROVIRAL THERAPY

Tables 11.5.A and 11.5.B provide the percentages of HIV-positive persons who were still on treatment among those who said they had initiated ART less than 12 months before the survey (Table 11.5.A) and 12 months or more (Table 11.5.B) before the survey.<sup>†</sup> Among adults living with HIV who initiated ART less than 12 months prior to the survey, 96.3% reported that they were still taking ART at the time of the survey (Table 11.5.A). Among adults who initiated ART more than 12 months before the survey, 99.0% reported that they were still on ART at the time of the survey. This was nearly identical between men and women (99.8% and 98.6% respectively) (Table 11.5.B). Among adults who initiated ART more than 12 months before the survey, and reported to be still on ART at the time of the survey, ARVs were detected in 99.7%. There was little variation by sociodemographic characteristics.

<sup>†</sup> It should be noted that it is only a self-reported retention and the estimation was not based on the formula used for cohort studies.

**Table 11.5.A Self-reported retention on antiretroviral (ARV) therapy (ART): people initiating ART LESS THAN 12 months before the survey**

Among HIV-positive persons aged 15-64 years who reported initiating ART less than 12 months before the survey, percentage who reported still receiving ART, by sex and selected demographic characteristics, EPHIA 2017-18

Characteristic	Male		Female		Total	
	Percentage still receiving ART <sup>†</sup>	Number	Percentage still receiving ART <sup>†</sup>	Number	Percentage still receiving ART <sup>†</sup>	Number
<b>Presence of detectable ARVs</b>						
Detectable	*	6	*	17	*	23
Not detectable	*	0	*	2	*	2
<b>Urban area size</b>						
Small (≤50,000)	*	3	*	10	*	13
Large (>50,000)	*	3	*	9	*	12
<b>Region</b>						
Tigray	*	0	*	4	*	4
Afar	*	1	*	1	*	2
Amhara	*	1	*	3	*	4
Oromia	*	1	*	3	*	4
Somali	*	0	*	0	*	0
Benishangul Gumuz	*	0	*	1	*	1
SNNPR	*	1	*	0	*	1
Gambella	*	1	*	2	*	3
Harari	*	0	*	2	*	2
Addis Ababa	*	0	*	3	*	3
Dire Dawa	*	1	*	0	*	1

**Table 11.5.A Self-reported retention on antiretroviral (ARV) therapy (ART): people initiating ART LESS THAN 12 months before the survey (continued)**

Among HIV-positive persons aged 15-64 years who reported initiating ART less than 12 months before the survey, percentage who reported still receiving ART, by sex and selected demographic characteristics, EPHIA 2017-18

Characteristic	Male		Female		Total	
	Percentage still receiving ART <sup>1</sup>	Number	Percentage still receiving ART <sup>1</sup>	Number	Percentage still receiving ART <sup>1</sup>	Number
<b>Marital status</b>						
Never married	*	1	*	2	*	3
Married	*	2	*	9	*	11
Living together	*	1	*	2	*	3
Divorced or separated	*	1	*	3	*	4
Widowed	*	1	*	3	*	4
<b>Education</b>						
No education	*	2	*	3	*	5
Primary	*	2	*	9	*	11
Secondary	*	2	*	7	*	9
More than secondary	*	0	*	0	*	0
<b>Wealth quintile</b>						
Lowest	*	2	*	3	*	5
Second	*	1	*	4	*	5
Middle	*	0	*	4	*	4
Fourth	*	2	*	4	*	6
Highest	*	1	*	4	*	5
<b>Religion</b>						
Ethiopian Orthodox	*	3	*	12	*	15
Muslim	*	2	*	4	*	6
Roman Catholic	*	0	*	0	*	0
Protestant	*	1	*	3	*	4
Other	*	0	*	0	*	0
<b>Ethnicity</b>						
Oromo	*	2	*	3	*	5
Amhara	*	2	*	8	*	10
Tigre	*	0	*	4	*	4
Afari	*	0	*	0	*	0
Somali	*	0	*	0	*	0
Welaita	*	0	*	1	*	1
Other	*	2	*	3	*	5

**Table 11.5.A Self-reported retention on antiretroviral (ARV) therapy (ART): people initiating ART LESS THAN 12 months before the survey (continued)**

Among HIV-positive persons aged 15-64 years who reported initiating ART less than 12 months before the survey, percentage who reported still receiving ART, by sex and selected demographic characteristics, EPHIA 2017-18

Characteristic	Male		Female		Total	
	Percentage still receiving ART <sup>1</sup>	Number	Percentage still receiving ART <sup>1</sup>	Number	Percentage still receiving ART <sup>1</sup>	Number
<b>Employment status (last 12 months)</b>						
Employed	*	4	*	5	*	9
Not employed	*	2	*	14	*	16
<b>Age</b>						
15-19	*	1	*	0	*	1
20-24	*	0	*	4	*	4
25-29	*	1	*	3	*	4
30-34	*	1	*	4	*	5
35-39	*	1	*	6	*	7
40-44	*	0	*	1	*	1
45-49	*	0	*	0	*	0
50-54	*	2	*	1	*	3
55-59	*	0	*	0	*	0
60-64	*	0	*	0	*	0
Total 15-24	*	1	*	4	*	5
Total 15-49	*	4	*	18	*	22
Total 50-64	*	2	*	1	*	3
Total 15-64	*	6	*	19	(96.3)	25

<sup>1</sup>Relates to Global AIDS Monitoring Indicator 1.3: Retention on antiretroviral therapy at 12 months.

Weighted figures.

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

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

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

**Table 11.5.B Self-reported retention on antiretroviral therapy (ART): people initiating ART MORE THAN 12 months prior to the survey**

Among HIV-positive persons aged 15-64 years who reported initiating ART 12 months or more before the survey, percentage who reported still receiving ART, by sex and selected demographic characteristics, EPHIA 2017-18

Characteristic	Male		Female		Total	
	Percentage still receiving ART <sup>1</sup>	Number	Percentage still receiving ART <sup>1</sup>	Number	Percentage still receiving ART <sup>1</sup>	Number
<b>Presence of detectable ARVs</b>						
Detectable	100.0	83	99.6	277	99.7	360
Not detectable	*	6	*	13	*	19
<b>Urban area size</b>						
Small (≤50,000)	(99.7)	48	99.9	116	99.8	164
Large (>50,000)	(100.0)	41	97.7	174	98.2	215
<b>Region</b>						
Tigray	*	2	*	24	(100.0)	26
Afar	*	7	*	12	*	19
Amhara	(100.0)	25	100.0	64	100.0	89
Oromia	*	19	97.0	66	97.8	85
Somali	*	2	*	5	*	7
Benishangul Gumuz	*	5	*	11	*	16
SNNPR	*	7	*	19	(100.0)	26
Gambella	*	6	*	13	*	19
Harari	*	2	*	17	*	19
Addis Ababa	*	9	(97.6)	38	(98.2)	47
Dire Dawa	*	5	*	21	(100.0)	26
<b>Marital status</b>						
Never married	*	16	*	21	(100.0)	37
Married	99.7	53	97.3	111	98.3	164
Living together	*	7	*	10	*	17
Divorced or separated	*	8	100.0	82	100.0	90
Widowed	*	5	98.4	66	98.5	71
<b>Education</b>						
No education	*	3	97.9	67	98.1	70
Primary	(100.0)	44	99.1	138	99.4	182
Secondary	(100.0)	27	98.1	66	98.7	93
More than secondary	*	15	*	18	(99.2)	33
<b>Wealth quintile</b>						
Lowest	*	7	(97.2)	48	97.6	55
Second	*	18	(100.0)	47	100.0	65
Middle	(100.0)	30	98.2	75	98.9	105
Fourth	*	19	98.0	70	98.3	89
Highest	*	15	100.0	50	100.0	65

**Table 11.5.B Self-reported retention on antiretroviral (ARV) therapy (ART): people initiating ART MORE THAN 12 months before the survey (continued)**

Among HIV-positive persons aged 15-64 years who reported initiating ART 12 months or more before the survey, percentage who reported still receiving ART, by sex and selected demographic characteristics, EPHIA 2017-18

Characteristic	Male		Female		Total	
	Percentage still receiving ART <sup>1</sup>	Number	Percentage still receiving ART <sup>1</sup>	Number	Percentage still receiving ART <sup>1</sup>	Number
<b>Religion</b>						
Ethiopian Orthodox	100.0	63	99.5	213	99.6	276
Muslim	*	12	(95.2)	39	97.1	51
Roman Catholic	*	0	*	1	*	1
Protestant	*	14	(95.4)	36	96.2	50
Other	*	0	*	1	*	1
<b>Ethnicity</b>						
Oromo	(100.0)	26	98.3	74	98.9	100
Amhara	(100.0)	48	98.3	151	98.8	199
Tigre	*	2	(100.0)	30	(100.0)	32
Afari	*	2	*	3	*	5
Somali	*	0	*	1	*	1
Welaita	*	1	*	2	*	3
Other	*	10	(99.3)	28	(99.0)	38
<b>Employment status (last 12 months)</b>						
Employed	99.7	56	98.9	127	99.2	183
Not employed <sup>2</sup>	(100.0)	32	98.4	162	98.7	194
<b>Age</b>						
15-19	*	8	*	8	*	16
20-24	*	1	*	5	*	6
25-29	*	3	(100.0)	35	(100.0)	38
30-34	*	3	97.6	62	97.7	65
35-39	*	14	96.8	79	97.2	93
40-44	*	21	(100.0)	44	100.0	65
45-49	*	13	*	23	(100.0)	36
50-54	*	13	*	21	(100.0)	34
55-59	*	8	*	5	*	13
60-64	*	5	*	8	*	13
Total 15-24	*	9	*	13	*	22
Total 15-49	99.7	63	98.5	256	98.8	319
Total 50-64	(100.0)	26	(100.0)	34	100.0	60
Total 15-64	99.8	89	98.6	290	99.0	379

<sup>1</sup>Relates to Global AIDS Monitoring Indicator 1.3: Retention on antiretroviral therapy at 12 months.

**Weighted figures.**

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.

<sup>2</sup>Estimates based on a very small denominator (less than 25) have been suppressed with an asterisk.

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

## 11.6 TRANSMITTED RESISTANCE TO ANTIRETROVIRAL DRUGS

As indicated in Section 1.3, one of the objectives of EPHIA 2017-2018 was to estimate the prevalence of transmitted ARV drug resistance, using samples from people living with HIV who were identified as having recent HIV infections using the HIV recent infection algorithm (Figure 2.5.A). Among 5 successfully amplified samples from recently infected adults, there was no evidence of resistance to ARVs (Table 11.6.A).

**Table 11.6.A Resistance to antiretrovirals (ARVs)**

Among persons aged 15-64 years who were recently infected with HIV, percentage with resistance to ARVs, by class of ARV resistance, EPHIA 2017-18			
	Percent	Number	DR Mutations Detected <sup>1</sup>
Successfully amplified	100	5	
Any	0	0	
Nucleoside reverse transcriptase inhibitor (NRTI)	0	0	
Non-Nucleoside reverse transcriptase inhibitor (NNRTI)	0	0	
Protease inhibitor (PI)	0	0	
NRTI & NNRTI	0	0	
NRTI, NNRTI & PI	0	0	

<sup>1</sup>Based on Stanford Database for HIV Drug Resistance Mutation

<https://cms.hivdb.org/prod/downloads/resistance-mutation-handout/resistance-mutation-handout.pdf>, Accessed June 12, 2020.

Unweighted figures.

## 11.7 HIV SUBTYPE

Table 11.7.A shows the distribution of HIV-subtypes among HIV-positive adults who underwent HIV genotyping. All (100%) of the 42 adults living with HIV who underwent HIV genotyping presented with subtype C.

**Table 11.7.A HIV subtype**

Percent distribution of HIV-positive persons aged 15-64 years who underwent genotyping, by HIV subtype, EPHIA 2017-18		
	Total	
	Percent	Number
Subtype A	0.0	0
Subtype B	0.0	0
Subtype C	100.0	42
Subtype D	0.0	0
Subtype G	0.0	0
Recombinant	0.0	0
Total	100.0	42

Unweighted figures.

## 11.8 GAPS AND UNMET NEEDS

- More than half of HIV-positive people who do not know their status were immunosuppressed, i.e., less than 350 cells/ $\mu$ L.
- More HIV-positive men were immunosuppressed, defined as having a CD4 count below 350 cells/ $\mu$ L, compared to women.
- Over a quarter of HIV-positive women who reported an HIV-negative status or never tested were severely immunosuppressed, with CD4 count less than 200 cells/ $\mu$ L.
- There is a need for early identification and ART initiation of people living with HIV who are unaware of their HIV-positive status—long before they experience immunosuppression.

## 11.9 REFERENCES

1. World Health Organization. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection. World Health Organization. Geneva; 2016.

# 12. PREVENTION OF MOTHER TO-CHILD TRANSMISSION

## KEY FINDINGS

- In urban Ethiopia, 95.3% of the women of childbearing age (those aged 15-49 years) who reported having delivered in the three years preceding the survey attended at least one antenatal care (ANC) visit for their most recent birth.
- Among women who gave birth during the 12 months preceding the survey, 91.6% knew their HIV status.
- Among HIV-positive women who reported giving birth during the 12 months preceding the survey, 99.3% attended at least one ANC visit.

## 12.2 BACKGROUND

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

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

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

## 12.3 ANTENATAL CARE ATTENDANCE

Among women of childbearing age (henceforth referred to as women or mothers in this chapter) who reported giving birth during the three years preceding the survey, the percentage who attended at least one ANC visit for their most recent birth was 95.3%, with very little regional variation, except for Somali region with 70.8% (Table 12.3.A). There was little variation observed across age groups, marital status, and education level.

Table 12.3.A Antenatal care

Among women aged 15-49 years who delivered in the three years before the survey, percentage who reported attending at least one antenatal care (ANC) visit for her most recent birth, by selected demographic characteristics, EPHIA 2017-18

Characteristic	Percentage who attended at least one ANC visit	Number
<b>Result of PHIA survey HIV test</b>		
HIV positive	(99.3)	45
HIV negative	95.5	1,937
Not tested	88.8	94
<b>Urban area size</b>		
Small ( $\leq 50,000$ )	92.5	1,115
Large ( $> 50,000$ )	98.3	961
<b>Region</b>		
Tigray	99.6	199
Afar	94.9	135
Amhara	95.8	314
Oromia	92.0	521
Somali	70.8	78
Benishangul Gumuz	94.6	81
SNNPR	96.7	309
Gambella	91.3	79
Harari	95.8	64
Addis Ababa	100.0	229
Dire Dawa	100.0	67
<b>Marital status</b>		
Never married	(92.2)	40
Married	95.7	1,687
Living together	96.5	168
Divorced or separated	91.2	147
Widowed	(88.2)	32
<b>Education</b>		
No education	89.6	364
Primary	94.7	766
Secondary	97.3	515
More than secondary	98.2	421
<b>Wealth quintile</b>		
Lowest	85.8	400
Second	94.0	389
Middle	96.7	434
Fourth	98.2	422
Highest	99.4	431

Table 12.3.A Antenatal care (continued)

Among women aged 15-49 years who delivered in the three years before the survey, percentage who reported attending at least one antenatal care (ANC) visit for her most recent birth, by selected demographic characteristics, EPHIA 2017-18

Characteristic	Percentage who attended at least one ANC visit	Number
<b>Religion</b>		
Ethiopian Orthodox	96.8	1,048
Muslim	95.0	588
Roman Catholic	*	8
Protestant	91.8	420
Other	*	12
<b>Ethnicity</b>		
Oromo	92.1	558
Amhara	96.9	645
Tigre	99.6	234
Afari	94.9	53
Somali	62.9	57
Welaita	96.6	61
Other	96.6	463
<b>Employment status (last 12 months)</b>		
Employed	95.3	686
Not employed	95.2	1,386
<b>Age</b>		
15-19	86.4	95
20-24	95.2	550
25-29	96.2	780
30-34	96.7	387
35-39	95.0	216
40-44	(84.2)	41
45-49	*	7
Total 15-24	93.9	645
Total 15-49	95.3	2,076

Weighted figures.

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

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

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

## 12.4 BREASTFEEDING

Among HIV-positive women who reported giving birth within the three years preceding the survey, 13.6% never breastfed, 60.0% ever breastfed but not currently, and 26.4% were breastfeeding at the time of the survey. (Table 12.4.A).

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

Percent distribution of last-born children born to women aged 15-49 years in the three years preceding the survey by breastfeeding status, by child's age and mother's HIV status, EPHIA 2017-18

Characteristic	Never breastfed	Ever breastfed, but not currently breastfeeding	Currently breastfeeding	Total	Number
<b>Child's age (months)</b>					
0-1	0.3	18.8	80.9	100.0	115
2-3	1.1	30.0	68.9	100.0	145
4-5	1.2	23.6	75.2	100.0	131
6-8	0.2	18.3	81.5	100.0	229
9-11	0.6	22.1	77.3	100.0	162
12-17	1.2	26.7	72.1	100.0	337
18-23	2.8	43.6	53.6	100.0	292
24-36	1.0	68.4	30.6	100.0	562
<b>Result of mother's PHIA survey HIV test</b>					
HIV positive	(13.6)	(60.0)	(26.4)	(100.0)	45
HIV negative	1.0	39.1	59.9	100.0	1,921
Not tested	0.0	32.6	67.4	100.0	91
Total	1.2	39.3	59.5	100.0	2,057

Weighted figures

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

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

## 12.5 AWARENESS OF MOTHER'S HIV STATUS

Among women who gave birth during the 12 months preceding the survey, 91.6% reported that they knew their HIV status. Among women who reported being tested for HIV and receiving their result during ANC for this pregnancy, 90.1% reported testing negative and 0.5% reported testing positive, while 1.1% of them reported that they already knew they were HIV positive.

A higher percentage of women aged 35-39 years, already knew that they were HIV positive (8.0%) before the most recent pregnancy, as compared to women in younger age groups (Table 12.5.A).

**Table 12.5.A Prevention of mother-to-child transmission: Known HIV status**

Among women aged 15-49 years who gave birth within the 12 months before EPHIA, percentage who were tested for HIV during antenatal care and received their results or who already knew they were HIV positive, by selected demographic characteristics, EPHIA 2017-18

Characteristic	Tested for HIV during ANC and received results		Percentage who already knew they were HIV positive	Total percentage with known HIV status <sup>1</sup>	Number of women who gave birth within the 12 months before the survey
	Percentage who tested HIV positive	Percentage who tested HIV negative			
<b>Urban area size</b>					
Small (≤50,000)	0.9	87.9	0.8	89.6	415
Large (>50,000)	0.0	92.4	1.4	93.8	368
<b>Region</b>					
Tigray	1.0	97.8	1.2	100.0	90
Afar	0.0	91.0	6.4	97.3	51
Amhara	0.7	91.6	1.8	94.0	125
Oromia	0.6	87.4	1.2	89.2	180
Somali	*	*	*	*	22
Benishangul Gumuz	(0.0)	(87.2)	(3.7)	(90.9)	37
SNNPR	0.0	84.7	0.0	84.7	119
Gambella	*	*	*	*	22
Harari	*	*	*	*	21
Addis Ababa	0.0	95.9	0.0	95.9	82
Dire Dawa	(0.0)	(88.9)	(3.1)	(92.0)	34
<b>Marital status</b>					
Never married	*	*	*	*	15
Married	0.1	90.7	0.7	91.6	656
Living together	4.1	82.4	2.9	89.4	66
Divorced or separated	(0.0)	(85.7)	(5.1)	(90.8)	41
Widowed	*	*	*	*	4
<b>Education</b>					
No education	0.0	82.8	2.8	85.6	128
Primary	1.3	88.3	1.5	91.1	279
Secondary	0.0	96.5	0.4	96.9	203
More than secondary	0.0	90.7	0.0	90.7	167
<b>Wealth quintile</b>					
Lowest	0.0	86.4	1.6	88.0	133
Second	1.4	87.3	0.2	88.9	149
Middle	0.9	86.7	2.2	89.8	165
Fourth	0.0	93.3	0.9	94.2	159
Highest	0.0	94.6	0.6	95.2	177

Table 12.5.A Prevention of mother-to-child transmission: Known HIV status (continued)

Among women aged 15-49 years who gave birth within the 12 months before EPHIA, percentage who were tested for HIV during antenatal care and received their results or who already knew they were HIV positive, by selected demographic characteristics, EPHIA 2017-18

Characteristic	Tested for HIV during ANC and received results		Percentage who already knew they were HIV positive	Total percentage with known HIV status <sup>1</sup>	Number of women who gave birth within the 12 months before the survey
	Percentage who tested HIV positive	Percentage who tested HIV negative			
<b>Religion</b>					
Ethiopian Orthodox	0.5	93.8	1.1	95.4	409
Muslim	0.8	87.2	1.8	89.7	219
Roman Catholic	*	*	*	*	4
Protestant	0.0	83.8	0.2	84.0	149
Other	*	*	*	*	2
<b>Ethnicity</b>					
Oromo	0.0	88.2	0.9	89.1	198
Amhara	0.8	91.9	1.4	94.2	260
Tigre	0.0	97.3	1.6	99.0	104
Afari	*	*	*	*	19
Somali	*	*	*	*	13
Welaita	*	*	*	*	23
Other	0.9	84.8	0.8	86.6	165
<b>Employment status (last 12 months)</b>					
Employed	0.0	90.5	1.1	91.6	242
Not employed	0.7	89.8	1.1	91.6	540
<b>Age</b>					
15-19	(0.0)	(88.0)	(0.0)	(88.0)	40
20-24	0.6	91.2	0.2	91.9	203
25-29	0.4	89.0	0.1	89.5	308
30-34	0.8	90.4	1.1	92.3	153
35-39	0.0	91.7	8.0	99.7	67
40-44	*	*	*	*	12
45-49	*	*	*	*	0
Total 15-24	0.5	90.7	0.1	91.3	243
Total 15-49	0.5	90.1	1.1	91.6	783

<sup>1</sup>Relates to PEPFAR Indicator PMTCT\_STAT\_NAT / SUBNAT: Percentage of pregnant women with known HIV status.

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

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

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

## 12.6 ANTIRETROVIRAL THERAPY AMONG HIV-POSITIVE PREGNANT WOMEN

There was not an adequate sample size to generate reliable estimates of HIV-positive women who delivered in the 12 months preceding the survey.

## 12.7 MOTHER-TO-CHILD TRANSMISSION

No children aged 0-17 months were identified to be HIV positive as part of the virological testing in EPHIA.

## 12.8 GAPS AND UNMET NEEDS

- Among HIV-positive women in urban Ethiopia who reported giving birth within the three years preceding the survey, 60.0% had ever breastfed but were not at the time of the survey, and 26.4% were breastfeeding at the time of the survey. This indicates the need for closer follow-up of mothers and infants, and stronger psychosocial support and counselling, especially regarding infant feeding and postpartum care.

## 12.9 REFERENCES

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



## 13. ADOLESCENTS AND YOUNG ADULTS

### KEY FINDINGS

- Among young people (older adolescents aged 15-19 years and young adults aged 20-24 years) living in urban Ethiopia, 2.7% reported having sex before the age of 15 years (2.2% among older adolescent boys and young men and 3.3% among older adolescent girls and young women).
- Among female young people, 2.1% of the older adolescent girls reported sex before the age of 15 years, compared to 4.5% of young women.
- HIV prevalence in older adolescents was 0.9% (1.0% in boys, 0.7% in girls) and 0.6% in young adults (0.3% in young men, 0.9% in young women).
- Based on self-reported and ARV-adjusted data, 63.0% of young people living with HIV were aware of their HIV-positive status, and among those who had been previously diagnosed, 100% were on ART. Among those on treatment, 74.3% had suppressed VLs.

## 13.2 BACKGROUND

One-third of the population of sub-Saharan Africa, including in Ethiopia, is between aged 10-24 years; a phenomenon often referred to as the youth bulge.<sup>12</sup> Older adolescents and young adults are more likely to engage in risky sexual behaviors than older adults and have less frequent contact with the healthcare system. Control of HIV in this age demographic is critical for long-term epidemic control but is also particularly challenging.

This chapter presents the prevalence of early sexual debut before age 15 years among young people by sex, marital status, region, and socio-demographic characteristics. It also describes knowledge of HIV prevention among younger adolescents boys and girls aged 12-14 years. These data were measured by asking participants to agree or disagree with both accurate and inaccurate statements about HIV prevention. Findings are also presented on attitudes towards HIV-positive people among young adolescents aged 12-14 years. This chapter also describes HIV prevalence and the 90-90-90 cascade for young people.

## 13.3 SEX BEFORE THE AGE OF 15 YEARS

Among young people, 2.7% (3.3% of older adolescent girls and young women and 2.2% of older adolescent boys and young men) reported having had sex before the age of 15 years. Among older adolescent girls, 2.1% reported sex before the age of 15 years, compared to 4.5% among young women. Among older adolescent boys and young men there was little variation, with 2.1% and 2.2%, respectively, reporting sexual debut before the age of 15 years. Among young people, the percentage of those who reported sex before the age of 15 years was higher among those with no education (10.5%), compared to those from other education categories (Table 13.3.A).

Sexual debut before the age of 15 years for young people ranges from 1.2% in Addis Ababa to 4.8% in Afar. For the older adolescent boys and young men, sexual debut before age of 15 years ranges from 0.7% in Amhara and Addis Ababa to 5.6% in Benishangul Gumuz, while for the older adolescent girls and young women, it ranges from 1.6% in Addis Ababa to 6.1% in Afar. Sex before the age of 15 years was reported by 3.6% of employed young people, and 2.4% among the non-employed. It was reported by 4.9% of the employed and 2.7% of the unemployed older adolescent girls and young women, and 2.5% of the employed and 2.0% of the unemployed older adolescent boys and young men (Table 13.3.A).

Table 13.3.A Sex before the age of 15 years

Percentage of male and female young people aged 15–24 years who have had sexual intercourse before the age of 15 years; by sex and selected demographic characteristics, EPHIA 2017-18

Characteristic	Male		Female		Total	
	Percentage who had sex before age of 15 years	Number	Percentage who had sex before age of 15 years	Number	Percentage who had sex before age of 15 years	Number
<b>Urban area size</b>						
Small (≤50,000)	2.7	1,530	4.2	2,312	3.4	3,842
Large (>50,000)	1.6	1,331	2.5	2,578	2.0	3,909
<b>Region</b>						
Tigray	2.7	163	2.4	343	2.5	506
Afar	3.5	112	6.1	183	4.8	295
Amhara	0.7	531	4.0	807	2.2	1,338
Oromia	3.2	675	3.3	1,105	3.3	1,780
Somali	0.0	167	3.2	247	1.5	414
Benishangul Gumuz	5.6	144	3.0	258	4.2	402
SNNPR	2.6	488	4.3	699	3.4	1,187
Gambella	2.7	144	3.7	211	3.1	355
Harari	1.4	75	5.4	150	3.5	225
Addis Ababa	0.7	276	1.6	713	1.2	989
Dire Dawa	2.3	86	2.2	174	2.2	260
<b>Marital status</b>						
Never married	2.1	2,537	1.0	3,174	1.6	5,711
Married	2.9	210	5.9	1,226	5.2	1,436
Living together	(0.0)	39	4.9	156	3.2	195
Divorced or separated	(7.3)	38	18.8	263	16.4	301
Widowed	*	3	*	13	*	16
<b>Education</b>						
No education	7.0	64	12.3	245	10.5	309
Primary	2.6	887	4.9	1,718	3.8	2,605
Secondary	2.0	1,268	1.8	1,819	1.9	3,087
More than secondary	1.4	635	1.5	1,104	1.5	1,739
<b>Wealth quintile</b>						
Lowest	2.7	675	5.6	891	3.9	1,566
Second	2.4	651	4.9	875	3.5	1,526
Middle	2.2	533	2.4	982	2.3	1,515
Fourth	2.1	521	2.6	997	2.4	1,518
Highest	1.1	481	1.8	1,145	1.5	1,626

Table 13.3.A Sex before the age of 15 years (continued)

Percentage of male and female young people aged 15–24 years who have had sexual intercourse before the age of 15 years; by sex and selected demographic characteristics, EPHIA 2017-18

Characteristic	Male		Female		Total	
	Percentage who had sex before age of 15 years	Number	Percentage who had sex before age of 15 years	Number	Percentage who had sex before age of 15 years	Number
<b>Religion</b>						
Ethiopian Orthodox	1.7	1,527	3.0	2,650	2.4	4,177
Muslim	1.9	635	3.9	1,185	3.0	1,820
Roman Catholic	*	13	(4.1)	26	(2.5)	39
Protestant	3.3	650	3.6	1,005	3.4	1,655
Other	(3.0)	34	*	22	2.2	56
<b>Ethnicity</b>						
Oromo	3.0	762	3.4	1,319	3.2	2,081
Amhara	0.9	916	3.3	1,674	2.2	2,590
Tigre	1.0	213	1.7	427	1.4	640
Afari	(4.4)	46	12.0	59	7.7	105
Somali	0.0	134	1.8	231	0.9	365
Welaita	6.0	104	4.5	160	5.3	264
Other	2.5	682	3.5	1,014	3.0	1,696
<b>Employment status (last 12 months)</b>						
Employed	2.5	944	4.9	1,246	3.6	2,190
Not employed	2.0	1,914	2.7	3,636	2.4	5,550
<b>Age</b>						
15-19	2.1	1,516	2.1	2,484	2.1	4,000
20-24	2.2	1,345	4.5	2,406	3.3	3,751
Total 15-24	2.2	2,861	3.3	4,890	2.7	7,751

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

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

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

### 13.4 KNOWLEDGE ABOUT HIV PREVENTION

Table 13.4.A and 13.4.B report on the knowledge about HIV transmission and prevention among younger adolescent boys and girls aged 12-14 years, respectively, by selected demographic characteristics.

Questions asked included:

1. Can a person reduce their chance of getting HIV by not having sex?
2. Can a person reduce their chance of getting HIV by using condoms when having sex?
3. Can a healthy-looking person have HIV or AIDS?
4. Can a mother with HIV or AIDS pass HIV to her unborn baby?
5. Are there medicines that people with HIV or AIDS can take to help them live longer?
6. Can male circumcision help prevent HIV infection?
7. Can female circumcision be a risk factor for HIV infection?
8. Can ARVs make people with HIV less likely to spread the virus?

Overall, 1.9% responded correctly to all eight questions (2.6% of the boys and 1.3% of the girls). Knowledge scores on individual questions among the boys varied, ranging from 81.8% of participants responding correctly to the question, "Are there medicines that people with HIV or AIDS can take to help them live longer?" to 21.2% responding correctly to the question, "Can male circumcision help prevent HIV infection?" (Tables 13.4.A and 13.4.B).

Among younger adolescent girls, 79.5% responded correctly to the question "Are there medicines that people with HIV or AIDS can take to help them live longer?" as compared to 18.6% of girls who responded correctly to the question, "Can male circumcision help prevent HIV infection?" (Table 13.4.B).

There was no significant difference between young adolescents aged 12-14 years in large urban areas and small urban areas. Knowledge scores were not markedly different across wealth quintiles (Table 13.4.C).

Table 13.4.A Young adolescents' knowledge about HIV: Boys

Among young adolescent boys aged 12-14 years, percentage who correctly identify both ways of preventing the sexual transmission of HIV and reject major misconceptions about HIV transmission, by selected demographic characteristics, EPHIA 2017-2018										
Characteristic	Percentage who correctly answered the questions:									Number
	Can a person reduce their chance of getting HIV by not having sex?	Can a person reduce their chance of getting HIV by using condoms when having sex?	Can a healthy-looking person have HIV or AIDS?	Can a mother with HIV or AIDS pass HIV to her unborn baby?	Are there medicines that people with HIV or AIDS can take to help them live longer?	Can male circumcision help prevent HIV infection?	Can female circumcision be a risk factor for HIV infection?	Can ARVs make people with HIV less likely to spread the virus?	All eight questions	
<b>Urban size</b>										
Small	76.5	77.0	44.3	68.2	74.4	15.6	41.7	21.3	1.9	179
Large	85.0	86.8	41.9	83.3	90.6	27.9	43.0	31.8	3.5	159
<b>Region</b>										
Tigray	(83.5)	(71.0)	(40.0)	(69.3)	(83.8)	(23.4)	(43.3)	(31.5)	(3.0)	31
Afar	*	*	*	*	*	*	*	*	*	13
Amhara	80.0	85.6	38.9	75.3	84.3	17.8	42.3	20.1	4.4	53
Oromia	78.4	76.1	61.6	72.1	79.8	24.8	43.0	31.0	4.2	81
Somali	*	*	*	*	*	*	*	*	*	13
Benishangul-Gumuz	*	*	*	*	*	*	*	*	*	10
SNNPR	78.9	85.4	26.6	74.7	79.1	6.8	40.4	12.2	0.0	63
Gambella	*	*	*	*	*	*	*	*	*	7
Harari	*	*	*	*	*	*	*	*	*	17
Addis Ababa	(88.0)	(94.8)	(36.7)	(88.8)	(91.9)	(38.0)	(45.9)	(38.0)	(0.0)	35
Dire Dawa	*	*	*	*	*	*	*	*	*	15
<b>Wealth quintile</b>										
Lowest	(81.1)	(82.4)	(33.5)	(68.0)	(73.2)	(10.2)	(32.7)	(20.6)	(0.0)	44
Second	81.3	84.4	42.1	80.0	80.2	23.8	31.0	28.3	3.7	54
Middle	78.2	82.4	42.8	77.5	82.3	12.8	41.4	24.2	3.8	60
Fourth	78.3	78.8	52.3	64.3	84.5	21.3	41.3	23.9	0.0	101
Highest	83.3	81.6	39.2	87.3	84.3	31.7	57.1	31.8	5.7	79
<b>Age</b>										
Total 12-14	80.4	81.5	43.2	75.1	81.8	21.2	42.3	26.1	2.6	338

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

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

Table 13.4.B Young adolescents' knowledge about HIV: Girls

Among young adolescent girls aged 12-14 years, percentage who correctly identify both ways of preventing the sexual transmission of HIV and reject major misconceptions about HIV transmission, by selected demographic characteristics, EPHIA 2016-2017										
Percentage who correctly answered the questions:										
Characteristic	Can a person reduce their chance of getting HIV by not having sex?	Can a person reduce their chance of getting HIV by using condoms when having sex?	Can a healthy-looking person have HIV or AIDS?	Can a mother with HIV or AIDS pass HIV to her unborn baby?	Are there medicines that people with HIV or AIDS can take to help them live longer?	Can male circumcision help prevent HIV infection?	Can female circumcision be a risk factor for HIV infection?	Can ARVs make people with HIV less likely to spread the virus?	All eight questions	Number
<b>Urban size</b>										
Small	75.0	68.3	41.2	72.8	78.0	17.0	44.1	27.9	1.4	199
Large	75.4	73.0	32.5	76.8	81.2	20.4	55.6	27.4	1.3	185
<b>Region</b>										
Tigray	(83.0)	(87.8)	(40.2)	(70.8)	(85.0)	(9.7)	(46.0)	(30.2)	(0.0)	42
Afar	*	*	*	*	*	*	*	*	*	15
Amhara	69.0	65.5	26.6	89.8	89.2	17.2	62.6	24.3	0.6	52
Oromia	74.3	66.4	46.2	73.1	76.0	17.0	45.8	34.8	1.8	124
Somali	*	*	*	*	*	*	*	*	*	11
Benishangul-Gumuz	*	*	*	*	*	*	*	*	*	11
SNNPR	82.9	79.2	34.5	71.1	80.3	22.6	51.5	20.0	1.5	57
Gambella	*	*	*	*	*	*	*	*	*	13
Harari	*	*	*	*	*	*	*	*	*	7
Addis Ababa	(69.3)	(62.2)	(17.2)	(70.6)	(73.5)	(24.2)	(51.5)	(19.0)	(2.0)	42
Dire Dawa	*	*	*	*	*	*	*	*	*	10
<b>Wealth quintile</b>										
Lowest	69.2	62.0	34.6	66.9	83.3	29.1	54.1	39.1	3.2	51
Second	73.4	69.5	42.5	77.0	75.7	15.2	35.9	29.4	2.0	64
Middle	76.3	70.0	40.3	69.2	79.5	15.0	47.5	22.0	0.0	70
Fourth	80.4	69.5	39.9	77.6	80.2	17.4	58.3	28.7	1.0	97
Highest	73.5	76.6	29.9	77.9	79.4	19.4	48.5	23.9	1.3	102
<b>Age</b>										
Total 12-14	75.2	70.5	37.1	74.7	79.5	18.6	49.4	27.7	1.3	384

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

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

Table 13.4.C Young adolescents' knowledge about HIV: Total

Among young adolescents aged 12-14 years, percentage who correctly identify both ways of preventing the sexual transmission of HIV and reject major misconceptions about HIV transmission, by selected demographic characteristics, EPHIA 2017-2018

Percentage who correctly answered the questions:										
Characteristic	Can a person reduce their chance of getting HIV by not having sex?	Can a person reduce their chance of getting HIV by using condoms when having sex?	Can a healthy-looking person have HIV or AIDS?	Can a mother with HIV or AIDS pass HIV to her unborn baby?	Are there medicines that people with HIV or AIDS can take to help them live longer?	Can male circumcision help prevent HIV infection?	Can female circumcision be a risk factor for HIV infection?	Can ARVs make people with HIV less likely to spread the virus?	All eight questions	Number
<b>Urban size</b>										
Small	75.7	72.5	42.7	70.6	76.2	16.3	42.9	24.7	1.6	378
Large	80.0	79.5	36.9	79.9	85.6	23.9	49.7	29.5	2.3	344
<b>Region</b>										
Tigray	83.2	80.3	40.1	70.1	84.5	15.8	44.8	30.8	1.3	73
Afar	(84.6)	(86.4)	(28.1)	(75.6)	(83.0)	(25.8)	(52.2)	(14.1)	(0.0)	28
Amhara	74.9	76.4	33.2	81.9	86.6	17.5	51.6	22.0	2.7	105
Oromia	76.0	70.5	52.7	72.7	77.6	20.3	44.7	33.2	2.8	205
Somali	*	*	*	*	*	*	*	*	*	24
Benishangul-Gumuz	*	*	*	*	*	*	*	*	*	21
SNNPR	80.8	82.6	30.3	73.1	79.6	14.1	45.5	15.8	0.7	120
Gambella	*	*	*	*	*	*	*	*	*	20
Harari	*	*	*	*	*	*	*	*	*	24
Addis Ababa	78.4	78.0	26.7	79.4	82.4	30.9	48.8	28.2	1.1	77
Dire Dawa	(80.9)	(59.9)	(35.5)	(57.6)	(65.8)	(8.9)	(27.9)	(19.0)	(0.0)	25
<b>Wealth quintile</b>										
Lowest	75.2	72.3	34.1	67.5	78.2	19.5	43.2	29.7	1.6	95
Second	77.0	76.4	42.3	78.4	77.8	19.1	33.6	28.9	2.8	118
Middle	77.2	75.7	41.4	73.1	80.8	14.0	44.7	23.0	1.8	130
Fourth	79.3	74.2	46.2	70.9	82.4	19.4	49.7	26.2	0.5	198
Highest	78.0	78.9	34.2	82.2	81.6	25.0	52.5	27.5	3.3	181
<b>Age</b>										
Total 12-14	77.7	75.7	40.0	74.9	80.6	19.8	46.0	26.9	1.9	722

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

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

### 13.5 DISCRIMINATORY ATTITUDES TOWARDS PEOPLE LIVING WITH HIV

Among younger adolescents aged 12-14 years, 37.3% of respondents who had heard of HIV said they would not share food with someone who has HIV, 35.6% said that they would not be friends with HIV-positive children, 40.5% said they will not be comfortable to have a teacher who has HIV, and 53.3% said they did not have any discriminatory attitudes. More than half (56.1%) of those in small urban areas held no discriminatory attitudes, compared to 49.9% of those in large urban areas. Among those in the lowest wealth quintile, 66.9% held no discriminatory attitudes, in comparison to 46.1% of those in the highest wealth quintile (Table 13.5.A).

**Table 13.5.A Discriminatory attitudes towards people living with HIV**

Among persons aged 12-14 years who have heard of HIV, percentage who report discriminatory attitudes towards people living with HIV, by selected demographic characteristics, EPHIA 2017-2018

Characteristic	Would you be willing to share food with someone who has HIV?	Would you be friend with someone who has HIV?	Would you be comfortable to have a teacher who has HIV?	All questions	Number
	Percentage who responded "No"	Percentage who responded "No"	Percentage who responded "No"	Percentage who responded "Yes" to all questions <sup>1</sup>	
<b>Urban size</b>					
Small	41.1	39.3	43.3	56.1	355
Large	32.8	31.0	37.2	49.9	310
<b>Region</b>					
Tigray	25.4	17.4	13.8	32.1	58
Afar	(27.3)	(31.1)	(36.7)	(40.4)	25
Amhara	40.1	27.6	38.6	58.3	99
Oromia	38.4	36.2	41.0	52.5	193
Somali	*	*	*	*	22
Benishangul-Gumuz	*	*	*	*	22
SNNPR	44.8	52.6	58.4	68.1	113
Gambella	*	*	*	*	18
Harari	*	*	*	*	22
Addis Ababa	24.4	28.5	34.2	40.7	69
Dire Dawa	*	*	*	*	24
<b>Wealth quintile</b>					
Lowest	55.5	40.8	55.2	66.9	89
Second	43.2	39.9	42.5	58.6	110
Middle	32.7	32.2	40.7	49.8	119
Fourth	35.4	38.7	38.7	51.9	180
Highest	28.7	28.8	33.1	46.1	167
<b>Age</b>					
Total 12-14	37.3	35.6	40.5	53.3	665

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

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

### 13.6 HIV INCIDENCE AND PREVALENCE

There were very few recent HIV infections detected among young people in EPHIA (HIV incidence was estimated to be 0.01%) however; the precision of estimates for age-sex sub-groups was low (see Table 5.3. B).

Overall HIV prevalence among young people was 0.7% (0.8% in older adolescent girls and young women and 0.6% in older adolescent boys and young men). HIV prevalence was 0.7% in older adolescent girls and 0.9% in young women; and 1.0% in older adolescent boys and 0.3% in young men (Table 6.3.A).

### 13.7 HIV TESTING, TREATMENT, AND VIRAL LOAD SUPPRESSION

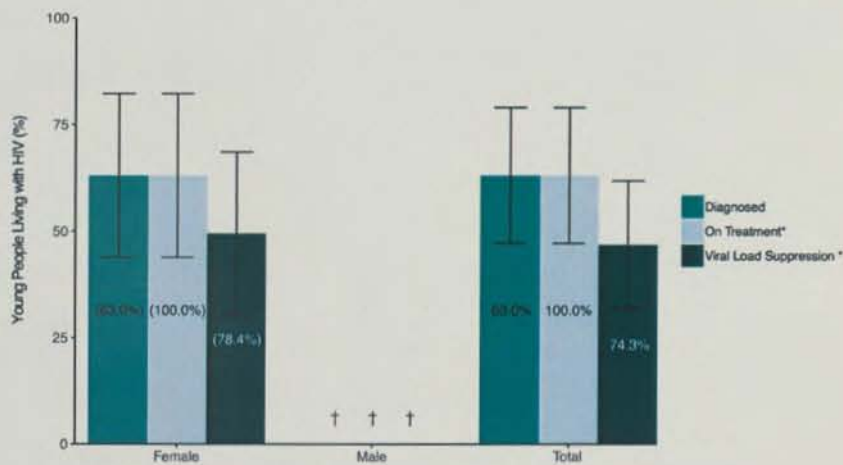
Among young people, 51.5% reported that they had ever tested for HIV and received their results (46.0% among older adolescent boys and young men and 56.9% among older adolescent girls and young women). The percentage among older adolescents was less than one-half of that among young adults (32.4% vs. 70.3%, respectively). Among young people, 21.0% (16.5% among older adolescent boys and young men and 25.4% among older adolescent girls and young women) reported testing and receiving results in the 12 months preceding the survey. The percentage among older adolescents (12.3%) is less than half of the percentage of young adults (29.6%). (Tables 7.3.A, 7.3.B, and 7.3.C).

Based upon self-report, among HIV-positive young people, 47.5% were unaware of their HIV status, and 49.9% were on ART (Table 8.3.C).

Overall, 48.2% of HIV-positive young people had suppressed viral loads. VLS was observed in 52.4% of older adolescents and in 42.3% of young adults living with HIV (Tables 9.3.A and 9.3.B). (Note: These estimates by age group disaggregation are based on small denominators between 25-49 and should be interpreted with caution.)

### 13.8 STATUS OF THE 90-90-90 TARGETS

Based on self-report and detection of ARVs in blood, it is estimated that 63.0% of young people living with HIV had been diagnosed and that among those who had been previously diagnosed, 100% were on ART. Among those on treatment, 74.3% had VLS (Table 10.3.B and Figure 13.7.A). Among all young people living with HIV (including those not previously diagnosed), 63.0% were on ART, and only 46.8% had VLS (Table 10.3.A).



**Figure 13.8.A**

Young people 90-90-90 (laboratory ARV-adjusted data among young people aged 15-24 years), EPHIA 2017-2018

In the antiretroviral (ARV)-adjusted 90-90-90, young people aged 15-24 years are classified as 'Aware' or 'Diagnosed' if they reported knowing their HIV-positive status before testing HIV seropositive in EPHIA or had detectable ARVs in their blood. Young people are classified as 'On Treatment' if they reported that they were on treatment or if they had detectable ARVs in their blood.

\*Inset numbers are conditional proportions.

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

### 13.9 GAPS AND UNMET NEEDS

- Almost half of young people in urban Ethiopia were unaware of their HIV-positive status. Testing strategies that better engage young people could increase awareness about HIV-positive status among this population.
- Almost a quarter of the HIV-positive young people in urban Ethiopia who reported taking ART did not achieve VLS.
- Many young adolescents 12-14 years of age do not have sufficient knowledge about HIV prevention and the ways to reduce their risk of HIV acquisition.
- Almost half of young adolescents 12-14 years of age had some form of discriminatory attitude. Improved efforts to educate the adolescents about HIV could reduce HIV-related stigma and discrimination.

### 13.10 REFERENCES

1. Hervish A, Clifton D. *The Status Report on Adolescents and Young People in Sub-Saharan Africa: Opportunities and Challenges*. Johannesburg and Washington, D.C.: Population Reference Bureau; 2012.
2. Central Statistical Agency (CSA). *Population Projections for Ethiopia 2007-2037*. Addis Ababa: Central Statistical Agency; July 2013.



## 14. CHILDREN

### KEY FINDINGS

- The estimated prevalence of HIV among children (those aged 0-14 years) in urban Ethiopia was 0.3%. This corresponds to approximately 19,000 children living with HIV in urban Ethiopia.

## 14.2 BACKGROUND

Estimates of prevalence of HIV in children, estimates of children living with HIV, and VLS among children are most commonly derived indirectly from clinic-based data or epidemiologic models. EPHIA provides direct measurements of these estimates among children. These estimates are critical for meeting the needs of pediatric HIV treatment, planning for HIV prevention, care and treatment services for children, evaluating PMTCT programs, and addressing specific needs of young adolescents (those aged 10-14 years).

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

## 14.3 HIV PREVALENCE

It is estimated that 0.3% of children in urban Ethiopia are living with HIV (0.3% of males and 0.3% of females). This corresponds to approximately 19,000 HIV-positive children in urban Ethiopia. The prevalence of HIV was 0.1% among those under 5 years of age, 0.2% among those aged 5-9 years, and 0.6% among those young adolescents (Table 6.3.A).

## 14.4 HIV TREATMENT AND VIRAL LOAD SUPPRESSION

Among children EPHIA identified as living with HIV, the sample size was inadequate to generate reliable estimates (Table 14.5.B). Since the number of observations was very small (less than 25 unweighted cases), the point estimates for the proportion of the children on treatment and with VLS were not reported.

## 14.5 STATUS OF THE UNAIDS 90-90-90 TARGETS

The sample size of children living with HIV identified in EPHIA was inadequate to generate reliable estimates (Table 14.5.B). Since the number of observations was very small (less than 25 unweighted cases), the point estimates for the proportion of the children on treatment and with VLS were not reported.

**Table 14.5.A Pediatric 90-90-90 (based on parent-reported antiretroviral therapy [ART] data; conditional percentages)**

90-90-90 targets among people living with HIV aged 0-14 years, by age, EPHIA 2017-18						
Age	Diagnosed		On Treatment		Viral Load Suppression (VLS)	
	Total		Among children whose parent reported that the child is HIV positive		Among children whose parent reported that the child is on ART	
	Percentage whose parent reported that the child is HIV positive	Number	Percentage whose parent reported that the child is on ART	Number	Percentage with VLS	Number
0-17 months	*	0	*	0	*	0
18-59 months	*	2	*	0	*	0
0-4 years	*	2	*	0	*	0
5-9 years	*	4	*	3	*	3
10-14 years	*	10	*	8	*	7
0-14 years	*	16	*	11	*	10

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

**Table 14.5.B Pediatric 90-90-90 (based on laboratory antiretroviral [ARV] data; conditional percentages)**

90-90-90 targets among people living with HIV aged 0-14 years, by age, EPHIA 2017-18						
Age	Diagnosed		On Treatment		Viral Load Suppression (VLS)	
	Total		Among children whose parent reported that the child is HIV positive or with detectable ARVs		Among children with detectable ARVs or whose parent reported current ARV usage for the child	
	Percentage whose parent reported that the child is HIV positive or with a detectable ARV <sup>1</sup>	Number	Percentage with a detectable ARV or whose parent reported current ARV usage for the child <sup>2</sup>	Number	Percentage with VLS <sup>3</sup>	Number
0-17 months	*	0	*	0	*	0
18-59 months	*	2	*	0	*	0
0-4 years	*	2	*	0	*	0
5-9 years	*	5	*	4	*	4
10-14 years	*	10	*	8	*	7
0-14 years	*	17	*	12	*	11

<sup>1</sup>Relates to Global AIDS Monitoring Indicator (GAM) 1.1: People living with HIV who know their HIV status and PEPFAR Indicator DIAGNOSED\_NAT: The percentage of adults and children living with HIV who know their status (have been diagnosed).

<sup>2</sup>Relates to GAM 1.2: People living with HIV on antiretroviral therapy and PEPFAR Indicator TX\_CURR\_NAT / SUBNAT: Percentage of adults and children receiving antiretroviral therapy (ART).

<sup>3</sup>Relates to GAM 1.4: People living with HIV who have suppressed viral loads and PEPFAR VL\_SUPPRESSION\_NAT: Percentage of people living with HIV on ART with a suppressed viral load.

Weighted figures.

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

# 15. HIV RISK BEHAVIORS

## KEY FINDINGS

- Among adults (ages 15-64 years) who reported sexual debut before the age of 15 years, the estimated HIV prevalence was 6.8% (7.6% for women and 2.6% for males).
- Among sexually active adults, 15.9% (18.5% of men and 13.0% of women) reported having sex with a non-marital or non-cohabitating partner in the 12 months preceding the survey, of whom 37.6% reported using a condom during their last sexual intercourse with such a non-marital or non-cohabitating partner.
- Among sexually active young people (ages 15-24 years), 36.6% (57.2% of older adolescent boys and young men and 23.0% of older adolescent girls and young women) reported having sex with a non-marital, non-cohabitating partner as compared to 4.5% (4.4% of men and 4.6% of women) of older adults aged 50-64 years.

## 15.2 BACKGROUND

This chapter describes the prevalence of sexual behaviors that elevate the risk of HIV infection. The EPHIA 2017-2018 asked questions about high-risk behaviors, including early sexual debut, recent engagement in multiple sexual partnerships, condom use at last sexual intercourse, recent engagement in paid sexual intercourse, and condom use at last sexual intercourse with a non-marital, non-cohabitating partner. With this information, programs can target those individuals most in need of information and most at risk for HIV infection.

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

## 15.3 HIV PREVALENCE BY SEXUAL BEHAVIOR

HIV prevalence among adults with the sexual debut before the age of 15 years (6.8%) was higher than those with the sexual debut during ages 20-24 years (2.7%) or ages 25 years and older (3.0%). Among adults in each category defined by the age of sexual debut, the prevalence of HIV infection was higher for women whose sexual debut was between ages 15-19 years or ages 20-24 years than for men with the same age of sexual debut (5.5% vs. 2.5% and 3.7% vs. 2.0%, respectively). (Table 15.3.A).

Among those who reported having two or more sexual partners in the 12 months preceding the survey, HIV prevalence among women was higher (11.2%) compared to men (0.7%).

Among adults who reported using a condom in the last sexual intercourse in the past 12 months, HIV prevalence was higher among women (17.7%) than men (5.3%) (Table 15.3.A).

**Table 15.3.A HIV prevalence by sexual behavior**

Prevalence of HIV among adults aged 15-64 years, by sex and sexual behavior characteristics, EPHIA 2017-18						
Characteristic	Male		Female		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
<b>Age at first sexual intercourse</b>						
<15	2.6	128	7.6	886	6.8	1,014
15-19	2.5	1,975	5.5	5,130	4.4	7,105
20-24	2.0	2,043	3.7	2,041	2.7	4,084
≥25	3.0	1,154	3.1	500	3.0	1,654
<b>Number of sexual partners in the preceding 12 months</b>						
0	2.8	1,117	7.9	2,572	6.0	3,689
1	2.4	3,548	3.4	5,230	2.9	8,778
≥2	0.7	339	11.2	158	3.1	497

Table 15.3.A HIV prevalence by sexual behavior (continued)

Prevalence of HIV among adults aged 15-64 years, by sex and sexual behavior characteristics, EPHIA 2017-18						
Characteristic	Male		Female		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
<b>Condom use at last sexual intercourse in the preceding 12 months</b>						
Used condom	5.3	450	17.7	343	9.6	793
Did not use condom	2.0	3,276	2.7	4,916	2.3	8,192
No sexual intercourse in the preceding 12 months	2.8	1,117	7.9	2,572	6.0	3,689
Total 15-24	0.6	2,759	0.8	4,788	0.7	7,547
Total 15-49	1.7	6,714	4.0	10,512	2.9	17,226
Total 50-64	4.2	823	4.7	1,087	4.4	1,910
Total 15-64	2.0	7,537	4.1	11,599	3.0	19,136

Weighted figures.

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

#### 15.4 CONDOM USE AT LAST SEX WITH A NON-MARITAL, NON-COHABITATING PARTNER

Overall among adults who reported having sex in the year preceding the survey, 15.9% (18.5% of men and 13.0% of women) reported having sex with a non-marital, non-cohabitating partner during this time. Of these adults, 37.6% (48.0% of men and 21.7% of women) reported using a condom during their last sexual intercourse with this non-marital, non-cohabitating partner (Tables 15.5.A, Table 15.5.B, and Table 15.5.C).

The percentage of sexually active persons reporting sexual intercourse with a non-marital, non-cohabitating partner in the last 12 months was higher among those residing in large urban areas (18.6%) than among those in small urban areas (13.4%). The percentage of sexually active persons reporting sexual intercourse with a non-marital, non-cohabitating partner ranged from 9.7% among those with no education to 20.3% among those with secondary education. The percentage reporting condom use at last sexual intercourse with a non-marital, non-cohabitating partner, ranged from 18.2% among those with no education to 46.6% among those with secondary education (Table 15.5.C).

Among sexually active young people, 36.6% (57.2% of older adolescent boys and young men and 23.0% of older adolescent girls and young women) reported having sex with a non-marital, non-cohabitating partner as compared to 4.5% (4.4% of men and 4.6% of women) of those aged 50-64 years.

Among sexually active adults residing in small urban areas, 13.4% (15.4% of men and 11.1% of women) reported having sex with a non-marital, non-cohabitating partner as compared to 18.6% (22.2% of men and 15.0% of women) of those residing in large urban areas. There were no differences observed with regards to condom use across various sociodemographic factors (Tables 15.5.A, Table 15.5.B, and Table 15.5.C)

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

Among men aged 15-64 years who reported having sex in the 12 months before the survey, percentage who reported having a non-marital, non-cohabitating partner during that time; and among those who reported having sex with a non-marital, non-cohabitating partner during that time, percentage who reported using a condom the last time they had sex with a non-marital, non-cohabitating partner, by selected demographic characteristics, EPHIA 2017-18

Characteristic	Among men who reported having sex in the 12 months before the survey		Among men who reported having sex with a non-marital, non-cohabitating partner in the 12 months before the survey	
	Percentage who reported having sex with a non-marital, non-cohabitating partner in the 12 months before the survey	Number	Percentage who reported using a condom the last time they had sex with a non-marital, non-cohabitating partner <sup>1</sup>	Number
<b>Urban area size</b>				
Small (≤50,000)	15.4	2,194	45.6	316
Large (>50,000)	22.2	1,928	49.9	416
<b>Region</b>				
Tigray	17.9	253	(52.5)	43
Afar	14.8	211	(49.1)	30
Amhara	15.8	635	40.4	99
Oromia	18.5	997	38.8	173
Somali	10.7	124	*	15
Benishangul Gumuz	15.9	204	(61.9)	33
SNNPR	16.4	730	56.3	117
Gambella	24.3	208	(41.5)	42
Harari	26.8	130	(43.3)	34
Addis Ababa	24.9	505	58.9	119
Dire Dawa	23.2	125	(49.4)	27
<b>Marital status</b>				
Never married	83.0	740	53.0	559
Married	2.6	2,944	33.6	69
Living together	4.8	270	*	11
Divorced or separated	61.6	147	33.3	85
Widowed	*	15	*	7
<b>Education</b>				
No education	13.8	309	(26.5)	35
Primary	13.5	1,452	38.9	186
Secondary	24.8	1,042	59.3	244
More than secondary	20.1	1,305	47.6	264

Table 15.4.A Condom use at last sex with a non-marital, non-cohabitating partner: Men (continued)

Among men aged 15-64 years who reported having sex in the 12 months before the survey, percentage who reported having a non-marital, non-cohabitating partner during that time; and among those who reported having sex with a non-marital, non-cohabitating partner during that time, percentage who reported using a condom the last time they had sex with a non-marital, non-cohabitating partner, by selected demographic characteristics, EPHIA 2017-18

Characteristic	Among men who reported having sex in the 12 months before the survey		Among men who reported having sex with a non-marital, non-cohabitating partner in the 12 months before the survey	
	Percentage who reported having sex with a non-marital, non-cohabitating partner in the 12 months before the survey	Number	Percentage who reported using a condom the last time they had sex with a non-marital, non-cohabitating partner <sup>1</sup>	Number
<b>Wealth quintile</b>				
Lowest	19.4	690	33.4	125
Second	18.2	743	42.8	136
Middle	16.3	922	49.6	157
Fourth	17.8	924	55.7	146
Highest	21.2	843	52.6	168
<b>Religion</b>				
Ethiopian Orthodox	21.3	2,264	48.0	461
Muslim	13.9	924	52.8	115
Roman Catholic	*	20	*	3
Protestant	14.7	867	43.9	137
Other	(35.8)	40	*	13
<b>Ethnicity</b>				
Oromo	18.3	1,117	45.3	189
Amhara	20.1	1,353	44.0	269
Tigre	21.3	347	55.6	69
Afari	17.8	66	*	9
Somali	3.9	98	*	5
Welaita	16.0	142	*	22
Other	16.2	978	54.0	161
<b>Employment status (last 12 months)</b>				
Employed	17.0	2,916	49.2	469
Not employed	22.4	1,203	46.0	263

Table 15.4.A Condom use at last sex with a non-marital, non-cohabitating partner: Men (continued)

Among men aged 15-64 years who reported having sex in the 12 months before the survey, percentage who reported having a non-marital, non-cohabitating partner during that time; and among those who reported having sex with a non-marital, non-cohabitating partner during that time, percentage who reported using a condom the last time they had sex with a non-marital, non-cohabitating partner, by selected demographic characteristics, EPHIA 2017-18

Characteristic	Among men who reported having sex in the 12 months before the survey		Among men who reported having sex with a non-marital, non-cohabitating partner in the 12 months before the survey	
	Percentage who reported having sex with a non-marital, non-cohabitating partner in the 12 months before the survey	Number	Percentage who reported using a condom the last time they had sex with a non-marital, non-cohabitating partner <sup>1</sup>	Number
<b>Age</b>				
15-19	79.4	127	50.3	96
20-24	51.8	474	49.7	223
25-29	26.0	898	51.9	207
30-34	13.4	708	49.3	90
35-39	8.4	574	(45.3)	49
40-44	6.9	436	(36.3)	25
45-49	3.2	324	*	11
50-54	4.0	245	*	13
55-59	5.1	192	*	11
60-64	4.2	144	*	7
Total 15-24	57.2	601	49.9	319
Total 15-49	20.6	3,541	48.9	701
Total 50-64	4.4	581	(22.6)	31
Total 15-64	18.5	4,122	48.0	732

<sup>1</sup>Relates to Global AIDS Monitoring Indicator 3.1B: Condom use at last high-risk sex.

Weighted figures.

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

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

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

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

Among women aged 15-64 years who reported having sex in the 12 months before the survey, percentage who reported having a non-marital, non-cohabitating partner during that time; and among those who reported having sex with a non-marital, non-cohabitating partner during that time, percentage who reported using a condom the last time they had sex with a non-marital, non-cohabitating partner, by selected demographic characteristics, EPHIA 2017-18

Characteristic	Among women who reported having sex in the 12 months before the survey		Among women who reported having sex with a non-marital, non-cohabitating partner in the 12 months before the survey	
	Percentage who reported having sex with a non-marital, non-cohabitating partner in the 12 months before the survey	Number	Percentage who reported using a condom the last time they had sex with a non-marital, non-cohabitating partner <sup>1</sup>	Number
<b>Urban area size</b>				
Small ( $\leq 50,000$ )	11.1	2,781	17.4	306
Large ( $> 50,000$ )	15.0	2,869	24.8	439
<b>Region</b>				
Tigray	12.3	449	23.0	57
Afar	6.6	266	*	20
Amhara	13.8	911	15.6	138
Oromia	13.5	1,403	19.6	189
Somali	6.3	223	*	14
Benishangul Gumuz	15.3	223	(19.7)	34
SNNPR	9.3	752	24.0	79
Gambella	13.7	266	(27.1)	36
Harari	13.6	196	*	23
Addis Ababa	15.3	745	30.0	114
Dire Dawa	18.1	216	(22.0)	41
<b>Marital status</b>				
Never married	70.0	543	27.0	369
Married	1.5	4,187	14.9	56
Living together	3.6	386	*	17
Divorced or separated	62.8	444	15.7	260
Widowed	39.9	77	(20.1)	32
<b>Education</b>				
No education	8.0	1,037	13.1	81
Primary	12.7	2,100	17.0	260
Secondary	14.8	1,320	23.3	197
More than secondary	16.3	1,167	30.7	206
<b>Wealth quintile</b>				
Lowest	14.8	920	11.2	127
Second	13.4	992	17.9	130
Middle	11.5	1,202	23.0	146
Fourth	11.7	1,274	24.6	159
Highest	14.1	1,262	27.4	183

Table 15.4.B Condom use at last sex with a non-marital, non-cohabitating partner: Women (continued)

Among women aged 15-64 years who reported having sex in the 12 months before the survey, percentage who reported having a non-marital, non-cohabitating partner during that time; and among those who reported having sex with a non-marital, non-cohabitating partner during that time, percentage who reported using a condom the last time they had sex with a non-marital, non-cohabitating partner, by selected demographic characteristics, EPHIA 2017-18

Characteristic	Among women who reported having sex in the 12 months before the survey		Among women who reported having sex with a non-marital, non-cohabitating partner in the 12 months before the survey	
	Percentage who reported having sex with a non-marital, non-cohabitating partner in the 12 months before the survey	Number	Percentage who reported using a condom the last time they had sex with a non-marital, non-cohabitating partner <sup>1</sup>	Number
<b>Religion</b>				
Ethiopian Orthodox	15.9	3,187	24.4	523
Muslim	7.2	1,332	8.5	102
Roman Catholic	*	23	*	1
Protestant	10.3	1,076	19.3	116
Other	(11.4)	29	*	3
<b>Ethnicity</b>				
Oromo	13.1	1,553	23.1	209
Amhara	14.5	1,985	20.0	302
Tigre	13.5	557	27.1	78
Afari	6.2	85	*	6
Somali	5.7	189	*	11
Welaita	17.9	140	(23.0)	27
Other	9.8	1,130	19.9	111
<b>Employment status (last 12 months)</b>				
Employed	17.2	2,172	22.5	388
Not employed	10.2	3,473	20.8	356
<b>Age</b>				
15-19	31.5	346	25.9	101
20-24	20.9	1,308	22.3	257
25-29	13.0	1,506	22.3	187
30-34	8.7	834	20.6	72
35-39	9.8	719	15.5	67
40-44	7.7	361	*	24
45-49	9.8	241	*	18
50-54	5.8	177	*	11
55-59	1.7	84	*	2
60-64	5.7	74	*	6
Total 15-24	23.0	1,654	23.3	358
Total 15-49	13.6	5,315	21.7	726
Total 50-64	4.6	335	*	19
Total 15-64	13.0	5,650	21.7	745

<sup>1</sup>Relates to Global AIDS Monitoring Indicator 3.1B: Condom use at last high-risk sex.

Weighted figures.

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

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

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

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

Among adults aged 15-64 years who reported having sex in the 12 months before the survey, percentage who reported having a non-marital, non-cohabitating partner during that time; and among those who reported having sex with a non-marital, non-cohabitating partner during that time, percentage who reported using a condom the last time they had sex with a non-marital, non-cohabitating partner, by selected demographic characteristics, EPHIA 2017-18

Characteristic	Among persons who reported having sex in the 12 months before the survey		Among persons who reported having sex with a non-marital, non-cohabitating partner in the 12 months before the survey	
	Percentage who reported having sex with a non-marital, non-cohabitating partner in the 12 months before the survey	Number	Percentage who reported using a condom the last time they had sex with a non-marital, non-cohabitating partner <sup>1</sup>	Number
<b>Urban area size</b>				
Small (≤50,000)	13.4	4,975	34.7	622
Large (>50,000)	18.6	4,797	39.8	855
<b>Region</b>				
Tigray	14.9	702	39.1	100
Afar	11.2	477	39.8	50
Amhara	14.8	1,546	28.9	237
Oromia	16.1	2,400	30.9	362
Somali	8.3	347	(30.0)	29
Benishangul Gumuz	15.6	427	44.8	67
SNNPR	13.5	1,482	46.7	196
Gambella	19.6	474	36.4	78
Harari	20.3	326	40.4	57
Addis Ababa	20.3	1,250	48.1	233
Dire Dawa	20.5	341	35.7	68
<b>Marital status</b>				
Never married	78.8	1,283	45.4	928
Married	2.1	7,131	27.1	125
Living together	4.2	656	(25.7)	28
Divorced or separated	62.5	591	21.1	345
Widowed	40.3	92	(19.6)	39
<b>Education</b>				
No education	9.7	1,346	18.2	116
Primary	13.1	3,552	28.6	446
Secondary	20.3	2,362	46.6	441
More than secondary	18.8	2,472	42.2	470

Table 15.5.A Male circumcision

Characteristic	Circumcised <sup>1</sup>		Uncircumcised	Unknown	Total	Number
	Medical circumcision	Non-medical circumcision				
<b>Result of PHIA survey HIV test</b>						
HIV positive	13.5	80.4	2.0	4.1	100.0	153
HIV negative	21.6	71.7	3.3	3.4	100.0	7,384
Not tested	25.9	66.5	2.9	4.6	100.0	475
<b>Urban area size</b>						
Small (≤50,000)	16.5	76.6	3.4	3.5	100.0	4,093
Large (>50,000)	27.2	66.1	3.1	3.6	100.0	3,919
<b>Region</b>						
Tigray	7.0	87.3	2.3	3.4	100.0	467
Afar	7.8	87.3	2.0	3.0	100.0	355
Amhara	6.2	85.0	4.5	4.3	100.0	1,334
Oromia	20.2	74.1	2.9	2.8	100.0	1,871
Somali	8.7	84.8	4.8	1.7	100.0	367
Benishangul Gumuz	7.8	82.7	3.1	6.4	100.0	355
SNNPR	40.7	53.1	2.0	4.2	100.0	1,289
Gambella	16.8	52.8	27.5	2.9	100.0	381
Harari	19.3	72.3	4.9	3.5	100.0	286
Addis Ababa	31.7	61.6	3.3	3.4	100.0	1,030
Dire Dawa	13.0	81.6	2.6	2.8	100.0	277
<b>Marital status</b>						
Never married	31.3	59.8	4.7	4.1	100.0	3,552
Married	14.4	80.4	1.9	3.3	100.0	3,585
Living together	11.8	83.3	4.2	0.7	100.0	416
Divorced or separated	19.0	74.7	1.8	4.5	100.0	356
Widowed	13.4	80.0	6.0	0.6	100.0	57
<b>Education</b>						
No education	7.0	87.0	3.9	2.2	100.0	470
Primary	16.6	76.2	3.6	3.7	100.0	2,634
Secondary	26.4	66.1	3.7	3.8	100.0	2,536
More than secondary	25.4	69.0	2.2	3.3	100.0	2,349
<b>Wealth quintile</b>						
Lowest	12.0	78.9	5.9	3.2	100.0	1,460
Second	17.3	77.0	3.6	2.1	100.0	1,567
Middle	21.3	72.7	1.9	4.1	100.0	1,648
Fourth	24.9	68.3	2.9	3.9	100.0	1,698
Highest	30.2	63.0	2.6	4.2	100.0	1,639

Table 15.5.A Male circumcision (continued)

Percent distribution of men aged 15-64 years by self-reported circumcision status, by result of PHIA survey HIV test and selected demographic characteristics, EPHIA 2017-18

Characteristic	Circumcised <sup>1</sup>		Uncircumcised	Unknown	Total	Number
	Medical circumcision	Non-medical circumcision				
<b>Religion</b>						
Ethiopian Orthodox	18.7	74.0	3.0	4.4	100.0	4,435
Muslim	18.6	75.6	3.0	2.9	100.0	1,834
Roman Catholic	(50.3)	(47.7)	(2.0)	(0.0)	(100.0)	32
Protestant	32.1	61.6	4.4	1.9	100.0	1,621
Other	18.4	77.5	2.3	1.9	100.0	79
<b>Ethnicity</b>						
Oromo	20.1	74.0	3.6	2.3	100.0	2,093
Amhara	15.6	75.9	3.6	4.8	100.0	2,776
Tigre	12.7	81.5	2.5	3.3	100.0	635
Afari	5.1	90.6	3.0	1.3	100.0	114
Somali	6.6	88.6	4.8	0.0	100.0	305
Welaita	53.2	43.3	1.0	2.4	100.0	264
Other	33.1	60.3	2.8	3.8	100.0	1,798
<b>Employment status (last 12 months)</b>						
Employed	19.4	74.6	2.3	3.7	100.0	4,523
Not employed	24.9	67.1	4.7	3.3	100.0	3,481
<b>Age</b>						
15-19	35.0	54.2	6.2	4.6	100.0	1,543
20-24	26.1	66.6	3.8	3.5	100.0	1,367
25-29	24.9	68.2	2.6	4.3	100.0	1,459
30-34	20.2	74.6	2.8	2.5	100.0	963
35-39	15.5	79.5	2.4	2.6	100.0	793
40-44	15.4	79.2	1.9	3.4	100.0	592
45-49	10.9	83.9	2.4	2.8	100.0	429
50-54	7.1	88.7	0.8	3.4	100.0	348
55-59	5.5	88.2	2.1	4.2	100.0	286
60-64	5.2	90.1	2.6	2.2	100.0	232
Total 15-24	30.5	60.4	5.0	4.1	100.0	2,910
Total 15-49	23.4	69.6	3.4	3.5	100.0	7,146
Total 50-64	6.1	88.9	1.6	3.4	100.0	866
Total 15-64	21.7	71.5	3.3	3.5	100.0	8,012

<sup>1</sup>Relates to Global AIDS Monitoring Indicator 3.16: Prevalence of male circumcision and PEPFAR Indicator VMMC\_TOTALCIRC NAT / SUBNAT.

Total number of men ever circumcised.

Weighted figures.

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

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

## 15.6 GAPS AND UNMET NEEDS

- Nearly two thirds of sexually active adults who reported to have sex with a non-marital, non-cohabitating partner in the last 12 months were not using a condom at last sex.
- The proportion of uncircumcised men in Gambella was significantly higher than other regions.

# 16. TUBERCULOSIS, SYPHILIS, HBV, STI SYMPTOMS, AND CERVICAL CANCER

## KEY FINDINGS

- Based on self-report, 57.0% of adults (ages 15-64 years) in urban Ethiopia who visited a tuberculosis (TB) clinic were tested for HIV during a TB clinic visit; however, 39.6% did not test for HIV during the visit and did not know their HIV status.
- Among adults living with HIV in urban Ethiopia who had ever visited a clinic for TB diagnosis and treatment, 63.3% were diagnosed with TB and of these, 100% were treated for TB.
- Overall, the prevalence of ever having been infected with syphilis was 13.4% among HIV-positive adults (17.4% among men and 11.5% among women). The overall prevalence of active syphilis infection was 2.6% (5.0% among men and 1.4% among women).
- The prevalence of hepatitis B was 4.8% among adults who tested HIV positive (7.4% among men and 3.6% among women).
- For women 15-64 years of age, the prevalence of abnormal vaginal discharge was twice as high in women living with HIV versus those without HIV (6.8% versus 3.5% respectively). In addition, ulcers or sores on or near the vagina were four times as likely to be reported among HIV-positive women than HIV-negative women (6.3% versus 1.3%).
- Among women with HIV aged 30-49 years in urban Ethiopia, the proportion who had been screened for cervical cancer was 18.5% in large urban areas and 12.9% in small urban areas.

## 16.2 BACKGROUND

People living with HIV are at risk for acquiring other diseases, including TB, hepatitis B, syphilis, and other sexually transmitted infections (STIs). TB is the leading cause of death among people living with HIV in sub-Saharan Africa. A UNAIDS model estimates there were 3,600 TB-related deaths among HIV-positive persons in Ethiopia in 2017.<sup>1</sup> This chapter describes the TB clinical care cascade for HIV-positive individuals: received care at a TB clinic, TB diagnoses among those receiving care, and treatment among those diagnosed with TB.

Syphilis is a relatively common STI, and untreated syphilis can result in severe morbidity and death in adults and children. Providing a syphilis diagnosis in a timely manner also allows patients to get treated, thereby reducing morbidity and transmission to sexual partners or vertically to newborn infants. As syphilis has been implicated in increasing transmission and acquisition of HIV, describing syphilis in HIV-positive individuals adds to the understanding of the epidemiology of HIV. This chapter describes syphilis prevalence in adults, by HIV status, age, sex, and sociodemographic characteristics.

HIV and HBV have similar transmission routes and concurrent infection with both viruses often results in more rapid progression of HBV disease to cirrhosis and higher liver disease-related mortality. EPHIA 2017-2018 provided population-based HBV prevalence estimates among HIV-positive individuals, which can support actionable policy recommendations for screening and treatment and may help gauge the impact of national HBV vaccination programs. This chapter describes the prevalence of HBV by region, sex, age, and other sociodemographic characteristics.

*Syphilis and Hepatitis B tests were done only among HIV-positive persons. For the description of testing methodologies (see Appendix B).*

Women living with HIV are at greater risk of developing cervical cancer because their weakened immune systems are not able to clear human papilloma virus (HPV) infections. WHO recommends HPV screening and treatment for all sexually active HIV-positive women. EPHIA 2017-2018 provides population-based rates of screening not available from routine clinic data, which does not capture women not in care. This chapter presents cervical cancer screening rates by age and socio-demographic characteristics.

## 16.3 TUBERCULOSIS

Table 16.3.A shows the prevalence of self-reported HIV testing during a clinic visit for TB diagnosis or treatment among adults by knowledge of HIV status and sex. Overall, 57.0 % of adults (53.9% of men and 60.7% of women) tested for HIV during a TB-related clinic visit, and 3.4% did not test because they already knew their HIV status. More than a third (39.6%) of adults (43.5% of men and 34.9% of women) who visited a clinic for TB diagnosis or treatment were not tested for HIV and did not know their HIV status.

Table 16.3.B presents information on the percentage of self-reported HIV-positive adults who visited a TB clinic, were diagnosed with TB, and received treatment. Among these HIV-positive adults, 38.1% had ever visited a TB clinic, with 49.5% of men having ever visited a TB clinic compared to 33.9% of women. Among those who had ever visited a clinic for TB diagnosis, 63.3% were diagnosed with TB (69.0% of men and 60.3% of women). All men and women diagnosed with TB reported to have been treated for TB.

**Table 16.3.A HIV testing in a clinic for tuberculosis (TB) diagnosis or treatment**

Percent distribution of adults aged 15-64 years who had ever visited a clinic for TB diagnosis or treatment by whether they were tested for HIV during a TB-related clinic visit, by sex, EPHIA 2017-18

Characteristic	Not Tested for HIV during a TB-related clinic visit			Total	Number
	Tested for HIV during a TB-related clinic visit	Already knew they were HIV positive	Did not know their status		
<b>Sex</b>					
Male	53.9	2.7	43.5	100.0	482
Female	60.7	4.4	34.9	100.0	608
Total 15-64	57.0	3.4	39.6	100.0	1,090

Weighted figures

**Table 16.3.B Self-reported tuberculosis (TB) diagnosis and treatment among HIV-positive adults**

Among self-reported HIV-positive adults aged 15-64 years, percentage who ever visited a TB clinic; among those who had ever visited a TB clinic, percentage who were diagnosed for TB; and among those diagnosed with TB, percentage who were treated for TB, by sex, EPHIA 2017-18

Characteristic	Among HIV-positive adults		Among HIV-positive adults who ever visited a TB clinic		Among HIV-positive adults who were diagnosed with TB	
	Percentage who ever visited a TB clinic	Number	Percentage who were diagnosed with TB	Number	Percentage who were treated for TB	Number
<b>Sex</b>						
Male	49.5	106	69.0	52	(100.0)	33
Female	33.9	371	60.3	128	100.0	80
Total 15-64	38.1	477	63.3	180	100.0	113

Weighted figures

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

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

## 16.4 SYPHILIS PREVALENCE AMONG HIV-POSITIVE PERSONS

Overall, the prevalence of ever having been infected with syphilis was 13.4% among HIV-positive adults aged 15-64 years (17.4% among men and 11.5% among women). The overall prevalence of active syphilis infection was 2.6% (5.0% among men and 1.4% among women). The prevalence of ever having been infected with syphilis did not vary between small urban areas (14.1%) and large urban areas (12.8%). There were also no differences by geographical regions and other sociodemographic characteristics (Table 16.4.A).

The prevalence of ever having been infected among adults aged 15-49 years was 10.2% (11.8% for men and 9.5% for women), compared to those aged 50-64 years (32.4%; 39.0% for men and 26.7% for women) (Table 16.4.A).

Table 16.4.A Syphilis prevalence

Prevalence of syphilis (ever infected and active infection) among adults aged 15-64 years, by sex, result of PHIA survey HIV test, and selected demographic characteristics, EPHIA 2017-18

Characteristic	Male			Female			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	17.4	5.0	153	11.5	1.4	461	13.4	2.6	614
<b>Urban area size</b>									
Small (≤50,000)	14.9	4.1	75	13.6	2.0	186	14.1	2.8	261
Large (>50,000)	20.1	5.9	78	9.8	1.0	275	12.8	2.4	353
<b>Region</b>									
Tigray	*	*	3	(3.2)	(3.2)	36	(6.7)	(2.9)	39
Afar	*	*	12	*	*	20	(11.5)	(0.0)	32
Amhara	(9.1)	(2.2)	33	16.1	1.2	85	13.6	1.6	118
Oromia	(15.5)	(5.1)	37	10.9	1.8	112	12.4	2.8	149
Somali	*	*	2	*	*	6	*	*	8
Benishangul Gumuz	*	*	6	*	*	14	*	*	20
SNNPR	*	*	14	(29.5)	(0.0)	35	(26.7)	(3.1)	49
Gambella	*	*	14	(4.0)	(0.0)	30	(8.1)	(0.0)	44
Harari	*	*	4	(0.0)	(0.0)	28	(3.7)	(3.7)	32
Addis Ababa	*	*	20	5.0	1.5	68	12.2	3.6	88
Dire Dawa	*	*	8	3.2	0.0	27	2.2	0.0	35
<b>Marital status</b>									
Never married	(22.9)	(5.0)	28	(0.0)	(0.0)	43	10.8	2.4	71
Married	17.4	5.6	88	11.4	1.7	168	14.1	3.4	256
Living together	*	*	12	*	*	17	(11.8)	(0.0)	29
Divorced or separated	*	*	17	13.7	1.0	127	14.2	2.1	144
Widowed	*	*	7	12.7	2.3	105	13.2	2.2	112
<b>Education</b>									
No education	*	*	10	17.5	2.2	111	17.5	2.0	121
Primary	12.3	3.6	72	10.5	1.8	219	11.1	2.4	291
Secondary	(22.6)	(4.8)	45	8.9	0.0	96	14.2	1.9	141
More than secondary	(27.5)	(12.7)	25	(0.0)	(0.0)	33	15.4	7.1	58
<b>Wealth quintile</b>									
Lowest	*	*	23	20.1	4.9	80	16.1	3.5	103
Second	(10.0)	(1.0)	27	4.5	0.0	81	6.3	0.3	108
Middle	(17.9)	(3.5)	40	13.7	1.3	103	15.2	2.1	143
Fourth	(21.8)	(3.6)	36	10.1	0.0	111	13.9	1.2	147
Highest	(29.2)	(18.5)	27	9.0	1.4	86	14.9	6.4	113

Table 16.4.A Syphilis prevalence (continued)

Prevalence of syphilis (ever infected and active infection) among adults aged 15-64 years, by sex, result of PHIA survey HIV test, and selected demographic characteristics, EPHIA 2017-18

Characteristic	Male			Female			Total		
	Percentage ever infected	Percentage active infection	Number	Percentage ever infected	Percentage active infection	Number	Percentage ever infected	Percentage active infection	Number
<b>Religion</b>									
Ethiopian Orthodox	19.9	5.4	102	12.9	1.4	337	15.0	2.6	439
Muslim	(8.7)	(5.7)	26	5.7	3.1	57	7.0	4.3	83
Roman Catholic	*	*	0	*	*	1	*	*	1
Protestant	(14.1)	(1.5)	25	5.2	0.0	61	8.3	0.5	86
Other	*	*	0	*	*	3	*	*	3
<b>Ethnicity</b>									
Oromo	(23.9)	(4.1)	39	9.7	2.1	123	14.4	2.8	162
Amhara	13.8	4.5	74	11.1	1.2	220	12.0	2.2	294
Tigre	*	*	5	(5.2)	(2.6)	48	10.8	8.5	53
Afari	*	*	4	*	*	4	*	*	8
Somali	*	*	0	*	*	1	*	*	1
Welaita	*	*	2	*	*	9	*	*	11
Other	(11.8)	(0.0)	29	24.6	0.0	55	18.8	0.0	84
<b>Employment status (last 12 months)</b>									
Employed	18.1	4.1	93	9.2	0.0	205	12.7	1.6	298
Not employed	16.7	6.5	59	13.4	2.6	254	14.2	3.6	313
<b>Pregnancy status</b>									
Currently pregnant <sup>1</sup>	NA	NA	NA	*	*	16	NA	NA	NA
Not currently pregnant	NA	NA	NA	11.8	1.5	444	NA	NA	NA

**Table 16.4.A Syphilis prevalence (continued)**

Prevalence of syphilis (ever infected and active infection) among adults aged 15-64 years, by sex, result of PHIA survey HIV test, and selected demographic characteristics, EPHIA 2017-18

Characteristic	Male			Female			Total		
	Percentage ever infected	Percentage active infection	Number	Percentage ever infected	Percentage active infection	Number	Percentage ever infected	Percentage active infection	Number
<b>Age</b>									
15-19	*	*	14	*	*	17	(4.7)	(4.7)	31
20-24	*	*	7	*	*	24	(0.8)	(0.0)	31
25-29	*	*	10	6.2	0.0	64	8.6	3.3	74
30-34	*	*	11	10.9	1.5	90	10.5	1.3	101
35-39	*	*	22	11.2	1.1	115	8.8	0.9	137
40-44	(25.4)	(8.7)	33	9.0	2.5	64	15.9	5.1	97
45-49	*	*	23	(13.6)	(2.7)	34	10.0	1.5	57
50-54	*	*	16	(17.2)	(0.0)	31	(23.2)	(2.5)	47
55-59	*	*	10	*	*	8	*	*	18
60-64	*	*	7	*	*	14	*	*	21
Total 15-24	*	*	21	(0.0)	(0.0)	41	3.1	2.7	62
Total 15-49	11.8	4.8	120	9.5	1.4	408	10.2	2.4	528
Total 50-64	(39.0)	(5.8)	33	26.7	1.8	53	32.4	3.6	86
Total 15-64	17.4	5.0	153	11.5	1.4	461	13.4	2.6	614

\*Relates to Global AIDS Monitoring Indicator 2.4: Syphilis among pregnant women.

Weighted figures.

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

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

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

**16.5 HEPATITIS B PREVALENCE AMONG HIV-POSITIVE PERSONS**

The prevalence of hepatitis B was 4.8% among HIV-positive adults (7.4% among men and 3.6% among women).

The prevalence of hepatitis B among women was lower in small urban areas (1.2%) compared to large urban areas (5.5%).

There were no differences by geographical regions and other sociodemographic characteristics (Table 16.5.A).

Table 16.5.A Hepatitis B prevalence

Prevalence of hepatitis B among adults aged 15-64 years, by sex, result of PHIA survey HIV test, and selected demographic characteristics, EPHIA 2017-18

Characteristic	Male		Female		Total	
	Percentage HBV positive	Number	Percentage HBV positive	Number	Percentage HBV positive	Number
<b>Result of PHIA survey HIV test</b>						
HIV positive	7.4	153	3.6	461	4.8	614
Urban area size						
Small (≤50,000)	7.0	75	1.2	186	3.2	261
Large (>50,000)	7.8	78	5.5	275	6.2	353
<b>Region</b>						
Tigray	*	3	(2.3)	36	(2.0)	39
Afar	*	12	*	20	(5.8)	32
Amhara	(7.8)	33	3.1	85	4.8	118
Oromia	(8.0)	37	5.0	112	6.0	149
Somali	*	2	*	6	*	8
Benishangul Gumuz	*	6	*	14	*	20
SNNPR	*	14	(3.5)	35	(5.5)	49
Gambella	*	14	(3.9)	30	(7.5)	44
Harari	*	4	(11.2)	28	(9.3)	32
Addis Ababa	*	20	1.1	68	2.7	88
Dire Dawa	*	8	(6.3)	27	(4.3)	35
<b>Marital status</b>						
Never married	(9.2)	28	(1.9)	43	5.3	71
Married	5.1	88	2.8	168	3.8	256
Living together	*	12	*	17	(12.0)	29
Divorced or separated	*	17	4.6	127	3.9	144
Widowed	*	7	4.9	105	6.0	112
<b>Education</b>						
No education	*	10	4.6	111	4.2	121
Primary	6.2	72	1.7	219	3.3	291
Secondary	(14.0)	45	6.0	96	9.1	141
More than secondary	(1.8)	25	(6.9)	33	4.0	58
<b>Wealth quintile</b>						
Lowest	*	23	5.5	80	6.2	103
Second	(1.0)	27	2.5	81	2.0	108
Middle	(12.3)	40	2.5	103	6.1	143
Fourth	(8.2)	36	4.4	111	5.6	147
Highest	(5.3)	27	3.2	86	3.8	113

Table 16.5.A Hepatitis B prevalence (continued)

Prevalence of hepatitis B among adults aged 15-64 years, by sex, result of PHIA survey HIV test, and selected demographic characteristics, EPHIA 2017-18						
Characteristic	Male		Female		Total	
	Percentage HBV positive	Number	Percentage HBV positive	Number	Percentage HBV positive	Number
<b>Religion</b>						
Ethiopian Orthodox	5.9	102	3.3	337	4.1	439
Muslim	(12.9)	26	7.2	57	9.7	83
Roman Catholic	*	0	*	1	*	1
Protestant	(8.9)	25	1.0	61	3.8	86
Other	*	0	*	3	*	3
<b>Ethnicity</b>						
Oromo	(7.4)	39	6.6	123	6.9	162
Amhara	4.9	74	2.8	220	3.5	294
Tigre	*	5	(3.0)	48	5.5	53
Afari	*	4	*	4	*	8
Somali	*	0	*	1	*	1
Welaïta	*	2	*	9	*	11
Other	(12.4)	29	0.5	55	5.8	84
<b>Employment status (last 12 months)</b>						
Employed	7.3	93	4.6	205	5.6	298
Not employed	7.7	59	2.9	254	4.1	313
<b>Pregnancy status</b>						
Currently pregnant	NA	NA	*	16	NA	NA
Not currently pregnant	NA	NA	3.7	444	NA	NA

**Table 16.5.A Hepatitis B prevalence (continued)**

Prevalence of hepatitis B among adults aged 15-64 years, by sex, result of PHIA survey HIV test, and selected demographic characteristics, EPHIA 2017-18						
Characteristic	Male		Female		Total	
	Percentage HBV positive	Number	Percentage HBV positive	Number	Percentage HBV positive	Number
<b>Age</b>						
15-19	*	14	*	17	(10.9)	31
20-24	*	7	*	24	(2.8)	31
25-29	*	10	3.5	64	3.3	74
30-34	*	11	2.7	90	4.6	101
35-39	*	22	5.5	115	6.0	137
40-44	(7.9)	33	2.6	64	4.8	97
45-49	*	23	(3.5)	34	6.1	57
50-54	*	16	(0.0)	31	(0.0)	47
55-59	*	10	*	8	*	18
60-64	*	7	*	14	*	21
Total 15-24	*	21	(2.4)	41	7.5	62
Total 15-49	9.3	120	3.6	408	5.3	528
Total 50-64	(0.0)	33	3.6	53	1.9	86
Total 15-64	7.4	153	3.6	461	4.8	614

Weighted figures.

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

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

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

## 16.6 SELF-REPORTED SYMPTOMS AND DIAGNOSIS OF SEXUALLY TRANSMITTED INFECTION

Among all men, 2.0% reported abnormal penile discharge, 1.2% reported a penile sore, and 1.1% reported being diagnosed with an STI by a medical professional in the 12 months before the survey. Among HIV-positive men, 3.1% reported abnormal discharge, and 3.2% reported a sore or ulcer, while 2.8% reported they had been diagnosed with an STI in the previous 12 months by a medical professional (Table 16.6.A). For women, 3.6% self-reported abnormal vaginal discharge in the past 12 months and 1.5% self-reported ulcer or sore on or near the vagina. Overall 1.5% of adult women were diagnosed with an STI in the previous 12 months by a doctor, clinical officer, or nurse. Among HIV-positive women, 6.8% reported abnormal discharge, while 6.3% reported a sore or ulcer, and 6.1% reported being medically diagnosed with an STI in the 12 months preceding the survey (Table 16.6.B).

Table 16.6.A Other sexually transmitted infections (STIs): Men

Among men aged 15-64 years, percentage who self-reported symptoms of a sexually transmitted infection and percentage who reported clinical diagnosis of a sexually transmitted infection in the 12 months before the survey; by HIV status and selected demographic characteristics, EPHIA 2017-18

Characteristic	Self-reported symptoms in the 12 months before the survey		Percentage who were diagnosed with an STI in the 12 months before the survey by a doctor, clinical officer, or nurse	Number
	Percentage who had abnormal discharge from the penis <sup>1</sup>	Percentage who had an ulcer or sore on or near the penis		
<b>Result of PHIA survey HIV test</b>				
HIV positive	3.1	3.2	2.8	135
HIV negative	2.1	1.2	1.0	5,263
Not tested	0.7	0.3	0.7	345
<b>Urban area size</b>				
Small (≤50,000)	2.3	1.2	1.2	2,928
Large (>50,000)	1.8	1.2	0.9	2,815
<b>Region</b>				
Tigray	2.7	0.6	2.8	323
Afar	1.2	0.7	0.6	272
Amhara	2.0	2.1	0.8	878
Oromia	2.3	1.6	1.0	1,398
Somali	1.4	0.9	0.9	197
Benishangul Gumuz	3.5	1.8	1.9	263
SNNPR	1.6	0.4	0.9	903
Gambella	3.6	3.1	2.7	280
Harari	0.0	0.0	0.4	226
Addis Ababa	1.8	0.7	0.8	793
Dire Dawa	1.7	0.0	1.1	210
<b>Marital status</b>				
Never married	2.7	1.5	1.3	1,369
Married	1.7	1.1	1.0	3,555
Living together	1.7	0.9	0.2	405
Divorced or separated	3.6	1.3	2.1	353
Widowed	0.0	2.0	0.0	56
<b>Education</b>				
No education	2.5	1.4	1.5	425
Primary	2.5	1.6	1.0	1,994
Secondary	1.7	1.5	1.0	1,509
More than secondary	1.6	0.6	0.9	1,803

Table 16.6.A Other sexually transmitted infections (STIs): Men (continued)

Among men aged 15-64 years, percentage who self-reported symptoms of a sexually transmitted infection and percentage who reported clinical diagnosis of a sexually transmitted infection in the 12 months before the survey; by HIV status and selected demographic characteristics, EPH 2017-18

Characteristic	Self-reported symptoms in the 12 months before the survey		Percentage who were diagnosed with an STI in the 12 months before the survey by a doctor, clinical officer, or nurse	Number
	Percentage who had abnormal discharge from the penis <sup>1</sup>	Percentage who had an ulcer or sore on or near the penis		
<b>Wealth quintile</b>				
Lowest	2.0	1.6	1.1	967
Second	2.3	0.9	1.0	1,053
Middle	2.6	2.2	1.5	1,234
Fourth	1.8	0.9	1.0	1,258
Highest	1.5	0.6	0.8	1,231
<b>Religion</b>				
Ethiopian Orthodox	2.2	1.3	1.3	3,253
Muslim	1.3	0.9	0.8	1,279
Roman Catholic	*	*	*	21
Protestant	2.2	1.1	0.7	1,123
Other	2.9	2.9	2.7	56
<b>Ethnicity</b>				
Oromo	2.2	1.4	1.1	1,564
Amhara	2.0	1.4	1.0	2,011
Tigre	2.4	1.1	2.2	460
Afari	2.0	1.2	2.0	82
Somali	0.5	0.0	0.0	159
Welaita	0.0	0.2	0.0	178
Other	2.0	1.0	0.9	1,263
<b>Employment status (last 12 months)</b>				
Employed	1.9	1.1	1.0	3,896
Not employed	2.2	1.5	1.2	1,843

Table 16.6.A Other sexually transmitted infections (STIs): Men (continued)

Among men aged 15-64 years, percentage who self-reported symptoms of a sexually transmitted infection and percentage who reported clinical diagnosis of a sexually transmitted infection in the 12 months before the survey; by HIV status and selected demographic characteristics, EPHIA 2017-18

Characteristic	Self-reported symptoms in the 12 months before the survey		Percentage who were diagnosed with an STI in the 12 months before the survey by a doctor, clinical officer, or nurse	Number
	Percentage who had abnormal discharge from the penis <sup>1</sup>	Percentage who had an ulcer or sore on or near the penis		
<b>Age</b>				
15-19	2.0	2.5	0.0	227
20-24	2.5	1.3	0.8	735
25-29	2.7	1.7	1.3	1,228
30-34	1.7	0.8	1.3	922
35-39	2.1	1.0	1.3	765
40-44	1.2	0.8	0.2	583
45-49	2.7	1.3	0.8	423
50-54	1.1	1.1	1.1	347
55-59	1.2	1.9	2.2	282
60-64	1.5	0.6	1.1	231
Total 15-24	2.4	1.6	0.6	962
Total 15-49	2.1	1.2	1.0	4,883
Total 50-64	1.2	1.2	1.4	860
Total 15-64	2.0	1.2	1.1	5,743

<sup>1</sup>Relates to Global AIDS Monitoring Indicator 10.4: Men with urethral discharge.

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

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

Table 16.6.B Other sexually transmitted infections (STIs): Women

Among women aged 15-64 years, percentage who self-reported symptoms of a sexually transmitted infection and percentage who reported clinical diagnosis of a sexually transmitted infection in the 12 months before the survey; by HIV status and selected demographic characteristics EPHIA 2017-18

Characteristic	Self-reported symptoms in the 12 months before the survey		Percentage diagnosed with an STI in the 12 months before the survey by a doctor, clinical officer, or nurse	Number
	Percentage who had abnormal discharge from the vagina	Percentage who had an ulcer or sore on or near the vagina		
<b>Result of PHIA survey HIV test</b>				
HIV positive	6.8	6.3	6.1	442
HIV negative	3.5	1.3	1.3	8,227
Not tested	1.3	0.9	0.9	425
<b>Urban area size</b>				
Small (<50,000)	3.7	1.7	1.7	4,334
Large (>50,000)	3.5	1.4	1.3	4,760
<b>Region</b>				
Tigray	3.8	1.9	1.9	700
Afar	2.5	0.7	0.7	413
Amhara	4.1	1.7	2.2	1,457
Oromia	4.2	2.0	1.7	2,188
Somali	1.2	0.2	0.5	391
Benishangul Gumuz	5.1	2.1	1.1	342
SNNPR	2.2	0.6	0.7	1,073
Gambella	3.6	3.1	2.0	375
Harari	2.1	1.8	0.4	365
Addis Ababa	3.1	1.2	1.0	1,378
Dire Dawa	1.6	0.7	0.6	412
<b>Marital status</b>				
Never married	3.6	1.5	1.5	1,092
Married	3.5	1.5	1.4	5,243
Living together	1.9	0.5	0.7	561
Divorced or separated	5.4	2.2	2.1	1,452
Widowed	2.4	1.6	1.5	724
<b>Education</b>				
No education	2.9	1.3	1.2	1,950
Primary	4.2	1.6	1.8	3,482
Secondary	3.7	2.1	1.6	2,019
More than secondary	2.9	1.1	1.1	1,617
<b>Wealth quintile</b>				
Lowest	4.0	1.4	1.9	1,584
Second	3.0	1.5	1.0	1,610
Middle	4.4	2.6	2.1	1,804
Fourth	3.2	1.3	1.4	1,981
Highest	3.4	1.1	1.2	2,114

**Table 16.6.B Other sexually transmitted infections (STIs): Women (continued)**

Among women aged 15-64 years, percentage who self-reported symptoms of a sexually transmitted infection and percentage who reported clinical diagnosis of a sexually transmitted infection in the 12 months before the survey; by HIV status and selected demographic characteristics, EPHIA 2017-18

Characteristic	Self-reported symptoms in the 12 months before the survey		Percentage diagnosed with an STI in the 12 months before the survey by a doctor, clinical officer, or nurse	Number
	Percentage who had abnormal discharge from the vagina	Percentage who had an ulcer or sore on or near the vagina		
<b>Religion</b>				
Ethiopian Orthodox	4.0	1.5	1.6	5,269
Muslim	2.6	1.7	1.1	2,166
Roman Catholic	0.0	0.0	(0.0)	31
Protestant	3.2	1.5	1.4	1,577
Other	5.3	0.0	(0.0)	45
<b>Ethnicity</b>				
Oromo	3.7	1.8	1.4	2,495
Amhara	3.8	1.7	1.6	3,359
Tigre	3.7	1.8	2.1	894
Afari	4.3	2.0	1.4	143
Somali	0.9	0.2	0.6	327
Welaïta	1.2	1.0	1.5	213
Other	3.2	0.7	1.1	1,648
<b>Employment status (last 12 months)</b>				
Employed	4.1	1.9	1.6	3,482
Not employed	3.2	1.3	1.4	5,602
<b>Age</b>				
15-19	2.2	2.0	1.4	553
20-24	3.9	2.1	1.5	1,727
25-29	3.8	1.9	1.8	2,100
30-34	3.9	1.5	1.9	1,256
35-39	4.2	1.0	1.1	1,174
40-44	3.9	1.4	1.4	689
45-49	3.4	1.7	1.3	481
50-54	2.3	1.6	1.3	461
55-59	1.7	0.0	0.7	299
60-64	2.3	0.6	0.6	354
Total 15-24	3.5	2.1	1.5	2,280
Total 15-49	3.8	1.7	1.6	7,980
Total 50-64	2.1	0.8	0.9	1,114
Total 15-64	3.6	1.5	1.5	9,094

Weighted figures.

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

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

### 16.7 SELF-REPORTED CERVICAL CANCER SCREENING AMONG HIV-POSITIVE WOMEN

Among self-reported HIV-positive women aged 30-49 years, 16.0% report being screened for cervical cancer. The proportion of women screened was higher in large urban areas (18.5%) than in small urban areas (12.9%). Among HIV-positive women with different education level or in different wealth quintiles, there were no significant differences (Table 16.7.A).

**Table 16.7.A Cervical Cancer Screening Among HIV-Positive Women**

Among HIV-positive women aged 30-49 years, percentage who report being screened for cervical cancer, by selected demographic characteristics, EPHIA 2017-18

Characteristic	Percentage who report ever having had a screening test for cervical cancer	Number
<b>Urban area size</b>		
Small ( $\leq 50,000$ )	12.9	122
Large ( $> 50,000$ )	18.5	176
<b>Region</b>		
Tigray	*	24
Afar	*	15
Amhara	16.2	51
Oromia	16.8	74
Somali	*	2
Benishangul Gumuz	*	10
SNNPR	(15.5)	26
Gambella	*	17
Harari	*	22
Addis Ababa	(12.7)	39
Dire Dawa	*	18
<b>Marital status</b>		
Never married	*	13
Married	17.5	127
Living together	*	11
Divorced or separated	20.5	76
Widowed	12.7	71
<b>Education</b>		
No education	15.7	78
Primary	14.1	132
Secondary	19.9	63
More than secondary	*	23

Table 16.7.A Cervical Cancer Screening Among HIV-Positive Women (continued)

Among HIV-positive women aged 30-49 years, percentage who report being screened for cervical cancer, by selected demographic characteristics, EPHIA 2017-18		
Characteristic	Percentage who report ever having had a screening test for cervical cancer	Number
<b>Wealth quintile</b>		
Lowest	(11.2)	49
Second	(11.4)	46
Middle	21.6	67
Fourth	17.3	85
Highest	15.7	51
<b>Religion</b>		
Ethiopian Orthodox	17.7	220
Muslim	(12.4)	40
Roman Catholic	*	1
Protestant	(7.7)	34
Other	*	1
<b>Ethnicity</b>		
Oromo	17.3	82
Amhara	13.1	139
Tigre	(23.8)	33
Afari	*	3
Somali	*	1
Welaita	*	6
Other	(13.1)	34
<b>Employment status (last 12 months)</b>		
Employed	15.5	139
Not employed	15.7	158
<b>Age</b>		
30-34	11.7	90
35-39	13.5	113
40-44	21.8	63
45-49	(22.3)	32
Total 30-49	16.0	298

\*Relates to Global AIDS Monitoring Indicator 10.10: Cervical cancer screening among women living with HIV.

Weighted figures.

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

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

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

## 16.7 SELF-REPORTED CERVICAL CANCER SCREENING AMONG HIV-POSITIVE WOMEN

Among self-reported HIV-positive women aged 30-49 years, 16.0% report being screened for cervical cancer. The proportion of women screened was higher in large urban areas (18.5%) than in small urban areas (12.9%). Among HIV-positive women with different education level or in different wealth quintiles, there were no significant differences (Table 16.7.A).

**Table 16.7.A Cervical Cancer Screening Among HIV-Positive Women**

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<b>Urban area size</b>		
Small ( $\leq 50,000$ )	12.9	122
Large ( $> 50,000$ )	18.5	176
<b>Region</b>		
Tigray	*	24
Afar	*	15
Amhara	16.2	51
Oromia	16.8	74
Somali	*	2
Benishangul Gumuz	*	10
SNNPR	(15.5)	26
Gambella	*	17
Harari	*	22
Addis Ababa	(12.7)	39
Dire Dawa	*	18
<b>Marital status</b>		
Never married	*	13
Married	17.5	127
Living together	*	11
Divorced or separated	20.5	76
Widowed	12.7	71
<b>Education</b>		
No education	15.7	78
Primary	14.1	132
Secondary	19.9	63
More than secondary	*	23

Table 16.7.A Cervical Cancer Screening Among HIV-Positive Women (continued)

Among HIV-positive women aged 30-49 years, percentage who report being screened for cervical cancer, by selected demographic characteristics, EPHIA 2017-18

Characteristic	Percentage who report ever having had a screening test for cervical cancer	Number
<b>Wealth quintile</b>		
Lowest	(11.2)	49
Second	(11.4)	46
Middle	21.6	67
Fourth	17.3	85
Highest	15.7	51
<b>Religion</b>		
Ethiopian Orthodox	17.7	220
Muslim	(12.4)	40
Roman Catholic	*	1
Protestant	(7.7)	34
Other	*	1
<b>Ethnicity</b>		
Oromo	17.3	82
Amhara	13.1	139
Tigre	(23.8)	33
Afari	*	3
Somali	*	1
Welaita	*	6
Other	(13.1)	34
<b>Employment status (last 12 months)</b>		
Employed	15.5	139
Not employed	15.7	158
<b>Age</b>		
30-34	11.7	90
35-39	13.5	113
40-44	21.8	63
45-49	(22.3)	32
Total 30-49	16.0	298

\*Relates to Global AIDS Monitoring Indicator 10.10: Cervical cancer screening among women living with HIV.

Weighted figures.

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

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

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

## 16.8 GAPS AND UNMET NEEDS

- More than a third of HIV-positive adults ever visited a clinic for TB diagnosis and treatment. Among adults who ever visited a clinic for TB diagnosis or treatment, more than a third were not tested for HIV although they did not know their HIV status. Better implementation of collaborative HIV/TB services and effective linkages between TB and HIV could improve outcomes among people at risk of HIV/TB coinfection.
- Active syphilis coinfection is a major health problem among HIV-positive persons.
- Hepatitis B coinfection is also a public health problem among people living with HIV.
- Less than a quarter of HIV-positive women aged 30-49 years reported they had ever been screened for cervical cancer. HIV-positive women at risk for this common co-morbidity are in need of expanded screening services.

## 16.7 REFERENCES

1. Joint United Nations Programme on HIV/AIDS. UNAIDS data tables, 2017. <http://aidsinfo.unaids.org/>. Accessed September 18, 2018.

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DISCUSSION AND  
CONCLUSIONS



## DISCUSSION AND CONCLUSIONS

- In urban Ethiopia, the annual HIV incidence was 0.05% (6,000 new cases) among adults (defined as individuals aged 15-64 years) in 2017-2018.
- While HIV incidence was low, steps should be taken to bring it to zero.
- In urban Ethiopia, the HIV prevalence was 3.0% among adults in 2017-2018, which corresponds to 384,000 persons living with HIV. HIV prevalence varies by demographic characteristics and region, which calls for further investigation into understanding the various aspects of the epidemic.
- The findings indicate that there is some reluctance to disclose HIV-positive status in urban Ethiopia. More interventions are needed to encourage people to disclose their HIV status.
- Ethiopia has made considerable progress towards 90-90-90 targets in urban areas. However, there is a major gap in the diagnosis of those living with HIV, especially among young people and adult men in general. More interventions are needed to improve case finding, especially among young people and adult men.
- About one third of the adults living with HIV in urban Ethiopia do not have VLS. This finding was more pronounced among younger people and in certain regions, indicating a need to improve case finding as well as adherence to treatment.
- More than half of HIV-positive people who do not know their status were immunosuppressed, with CD4 count less than 350 cells/ $\mu$ L. More HIV-positive men were immunosuppressed compared to women.
- Over a quarter of HIV-positive women who reported that they were HIV negative or never tested were severely immunosuppressed, with CD4 count less than 200 cells/ $\mu$ L. More efforts are needed to identify these individuals and initiate them on ART.
- Many adolescents 12-14 years of age show inadequate information about HIV transmission and exhibit discriminatory attitudes towards HIV-positive people. There is a need to provide further education about HIV modes of transmission and people living with HIV for this age group.
- Nearly two thirds of sexually active adults who reported to have sex with a non-marital, non-cohabitating partner in the last 12 months were not using a condom at last sex. More efforts are needed to promote condom use, particularly among people at higher risk of infection.
- The proportion of uncircumcised men in Gambella was significantly higher than other regions. More interventions are needed to promote medical male circumcision in that region.
- Little more than a third of HIV-positive adults reported that they had ever visited a clinic for TB diagnosis or treatment. Approximately four out of 10 adults who did not know their HIV status when they visited a clinic for TB diagnosis or treatment were not tested for HIV. HIV testing at TB diagnosis or treatment units should be strengthened.
- The survey's findings demonstrate a need for interventions to improve screening for active syphilis and hepatitis B among people living with HIV.
- Less than a sixth of HIV-positive women aged 30-49 years reported that they had ever been screened for cervical

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# APPENDICES

## APPENDIX A SAMPLE DESIGN AND WEIGHTING

Appendix A provides a high-level overview of sampling and weighting procedures for EPHIA 2017-2018. In-depth details are provided in the EPHIA 2017-2018 Sampling and Weighting Technical Report, which may be found on the <https://phia.icap.columbia.edu/>.

### A.1 SAMPLE DESIGN

#### Overview

The sample design for EPHIA 2017-2018 is a stratified multistage probability sample design, with strata defined to be the urban areas in the 11 regions of the country, first-stage sampling units defined by EAs within strata, second-stage sampling units defined by households within EAs, and finally eligible persons within households. Within each urban region, the first-stage sampling units (also referred to as PSUs) were selected with probabilities proportionate to the number of households in the EA based on the 2007 Ethiopia Population and Housing Census. The allocation of the sample PSUs to the regional urban areas was made in a manner designed to achieve specified precision levels for regional estimates of viral load suppression (VLS) rates among HIV-positive adults 15-49 years of age.

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

Within the sampled households, all eligible adults aged 15-64 years were included in the study sample for data collection. Eligible children aged 0-14 years in a randomly selected one-half of the sampled households were included in the study for data collection.

#### Population of Inference

The population of inference for EPHIA 2017-2018 is comprised of the de facto household population. The de facto population is comprised of individuals who were present in households (i.e., slept in the household) on the night prior to the household interview. In contrast, the de jure population is comprised of individuals who are usual residents of the household, irrespective of whether or not they slept in the household on the night prior to the household interview.

#### Precision Specifications and Assumptions

The following specifications were used to develop the sample design for EPHIA 2017-2018.

- 95% confidence bounds of  $\pm 0.20$  or less around an estimated VLS rate among all HIV-positive adults aged 15-49 years for each of the 11 sampling strata of Ethiopia (see Table 2-2);
- Total combined sample size of approximately 20,000-25,000 analyzable blood draws among adults aged 15-64 years and children aged 0-14 years.

#### The following assumptions were used to develop the sample design for EPHIA 2017-2018:

- An overall HIV prevalence rate in urban areas of 0.021 (2.1%) for males aged 15-49 years and 0.042 (4.2%) for females aged 15-49 years, that varied by stratum (see Table 2-2). Source: 2017 projections developed by CDC-Ethiopia.
- A viral load suppression (VLS) rate of  $P_{vh} = 0.50$  (50%) among HIV-positive adults aged 15-49. This was a conservative assumption because it could have overstated the actual variance of the estimated VLS rate.
- An average sample size of 30 dwelling units per PSU were sampled (prior to losses due to vacancy and nonresponse).
- An intra-cluster correlation (ICC) of  $\rho = 0.05$  for prevalence and VLS rates. The ICC provided an average measure of the homogeneity of responses within the first-stage sampling units.
- An occupancy rate of 96% for sampled dwellings. Source: 2011 Ethiopia Demographic and Health Survey (DHS).
- An overall household response rate of 97% among occupied households. Source: 2011 Ethiopia DHS.
- The average number of persons aged 15 to 49 per urban household was 2.11. Source: 2011 Ethiopia DHS.
- The overall percentage of persons in urban households who were 0-14 years of age was 32.2%. Source: 2007 Ethiopia Population and Housing Census.
- The overall percentage of persons in urban households who were 50-64 years of age was 5.4%.

Source: 2007 Ethiopia Population and Housing Census.

- Among the eligible adults aged 15-64 years in urban households completing the household roster, a biomarker response rate of 78%. Source: 2011 Ethiopia DHS.
- Among the eligible children 0-14 years of age in urban households designated for child data collection, a biomarker response rate of 73%. This value was the corresponding biomarker response rate for adults minus 5%.

### **Selection of the Primary Sampling Units**

The PSUs for EPHIA 2017-2018 were defined as the EAs created for the 2007 Ethiopia Population and Housing Census. The sampling frame consisted of slightly over 17,000 urban EAs containing an estimated 3.0 million households at the time of the 2007 census. EAs in six of the nine zones in the Somali region were excluded from the sampling frame for security reasons.

A stratified sample of 395 EAs were selected from the sampling frame. The 11 strata specified for sampling were the urban centers of the 11 regions of Ethiopia. Two of the originally-sampled enumeration areas were found to no longer contain households because they had all been destroyed. These two EAs are considered to be out-of-scope (ineligible) and were deleted from the study sample. Thus, 393 of the 395 sampled EAs remained in the study for data collection.

The EA samples were selected systematically and with probabilities proportionate to a measure of size (MOS) equal to the number of households in the EA based on the 2007 Ethiopia Population and Housing Census. Prior to selection, the EAs were sorted by type of EA, including whether it was within a large urban area (population >50,000) or a small urban area (population ≤50,000), and by region, zone within region, wereda (district) within zone, town within wereda, kebele (ward or neighborhood) within town, and finally by EA within kebele. Sorting of the EAs prior to sample selection induces an implicit geographic stratification. To select the sample from a particular stratum, the cumulative MOS was determined for each EA in the ordered list of EAs, and the sample selections were designated using a sampling interval equal to the total MOS of the EAs in the stratum divided by the number of EAs to be selected and a random starting point. The resulting sample had the property that the probability of selecting an EA within a particular stratum was proportional to the MOS of the EA in the stratum.

Details regarding EA substitution and segmentation may be found in the EPHIA 2017-2018 Sampling and Weighting Technical Report available on the <https://phia.icap.columbia.edu/>.

### **Selection of Households**

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

The selection of households for EPHIA 2017-2018 involved the following steps: (1) listing the dwelling units/households within the sampled EAs; (2) assigning eligibility codes to the listed dwelling unit/household records; (3) selecting the samples of dwelling units/households; and (4) designating a subsample of households for data collection for children.

A description of the household listing process as well as a summary of household eligibility may be found in the EPHIA 2017-2018 Sampling and Weighting Technical Report on the <https://phia.icap.columbia.edu/>.

Selection of households utilized an equal probability design. In order to achieve equal probability samples of households within each of the 11 regions' urban areas, the sampling rates required to select dwelling units/households within an EA depended on the difference between the MOS used in sampling and the actual number of dwelling units/households found at the time of listing in late 2017. Thus, application of these within-EA sampling rates could have yielded more or less than the desired 30 households in EAs where the sampling MOS differs from the actual listing count. The EPHIA 2017-2018 Sampling and Weighting Technical Report provides an in-depth description of the equal probability sample design, as well as a detailed summary of the results of the household selection.

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

Stratum (Region)	Number of sample PSUs	Number of sampled dwelling units/households	Minimum PSU sample size	Maximum PSU sample size	UEW DEFF for dwelling unit sample
Tigray	26	779	15	57	1.00
Afar	17	513	15	60	1.01
Amhara	71	2,114	15	60	1.05
Oromia	92	2,759	15	60	1.08
Somali	17	513	15	60	1.03
Benishangul Gumuz	17	513	16	60	1.01
SNNPR	51	1,513	15	60	1.03
Gambella	17	513	15	45	1.01
Harari	16	498	19	60	1.00
Addis Ababa City Adm	52	1,582	15	60	1.09
Dire Dawa City Adm	17	513	15	43	1.00
Total	393	11,810	15	60	1.28 <sup>1</sup>

<sup>1</sup>Overall DEFF reflects total variation in weights within and across regions.

### Selection of Individuals

The selection of individuals for EPHIA 2017-2018 involved the following steps: (1) compiling a list of all individuals known to reside in the household or who slept in the household during the night prior to data collection; (2) identifying those rostered individuals who were eligible for data collection; and (3) selecting for the study those individuals who met the age and residency requirements of the study. However, only those individuals who slept in the household the night before the household interview (i.e., the de facto population) were retained for subsequent weighting and analysis.

The EPHIA 2017-2018 Sampling and Weighting Technical Report provides a brief description of the process for listing and selecting individuals for participation in EPHIA 2017-2018, and also presents detailed summaries of the distributions of eligible individuals and participants in individual interviews and HIV testing by strata and age.

## A.2 WEIGHTING

### Overview

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

Nonresponse is unavoidable in virtually all surveys of human populations. For EPHIA 2017-2018, nonresponse could have occurred at different stages of data collection, for example, (1) before the enumeration of individuals in the household, (2) after household enumeration and selection of persons, but before completion of the individual interview, and (3) after completion of the interview, but before collection of a viable blood sample.

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

## Methods

The overall weighting approach for EPHIA 2017-2018 included several steps. Methods and results for each of the steps below are detailed in the EPHIA 2017-2018 Sampling and Weighting Technical Report.

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

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

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

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

**Calculation of person-level interview weights:** Once the household weights were determined, they were used to calculate the individual base weights. The individual base weights were then adjusted for nonresponse among the eligible individuals, with a final adjustment for the individual weights to compensate for under-coverage in the sampling process by post-stratifying (i.e., weighting up) to 2017 population projections.

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

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

## A.3 REFERENCES

1. Central Statistical Agency [Ethiopia] (CSA) and ICF International. Ethiopia Demographic and Health Survey 2011. Addis Ababa, Ethiopia and Calverton, Maryland, United States: CSA and ICF International; 2012. <https://dhsprogram.com/pubs/pdf/FR255/FR255.pdf>. Accessed September 17, 2019.
2. Joint United Nations Programme on HIV/AIDS. UNAIDS data tables, 2014. <http://aidsinfo.unaids.org/>. Accessed September 17, 2019.

## APPENDIX B HIV TESTING METHODOLOGY

### B.1 SPECIMEN COLLECTION AND HANDLING

Blood was collected by qualified survey staff from consenting participants: 14 mL of venous blood from adults, 5 mL from children aged 2-14 years and 1 mL of capillary blood from adults (ages 15-64 years) who either refused to give venous blood or failed to be collected using vacuum tubes, and from children aged 0-2 years—using finger-stick for children aged 6-24 months, and heel-stick for infants younger than 6 months of age.

Blood samples were labeled with a unique barcoded participant identification number and stored in temperature-controlled cooler boxes with well-frozen Techni-Ice (Techni-Ice Australia Factory Outlet Address: 3 Finch St, Frankston, Victoria, Australia) at the field level. At the end of each day, samples were transported to a satellite laboratory for processing into plasma aliquots and dried blood spots (DBS), and were frozen and stored at -20°C within 24 hours of blood collection. Samples were transported on a weekly basis to the national HIV reference laboratory, EPHI, in Addis Ababa for additional testing and long-term storage at -80°C.

### B.2 HOUSEHOLD-BASED PROCEDURES

#### *HIV Rapid Testing*

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

#### *CD4 Testing*

All participants who tested HIV positive and a random sample of 2% of participants who tested HIV negative received a CD4 T-cell count measurement in the field by qualified survey staff. The measurement was performed using a Pima™ Analyzer and Pima™ CD4 Cartridge (Abbott Molecular Inc., Chicago, Illinois, United States, formerly Alere).

#### *Counseling, Referral to Care, and Active Linkage to Care*

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

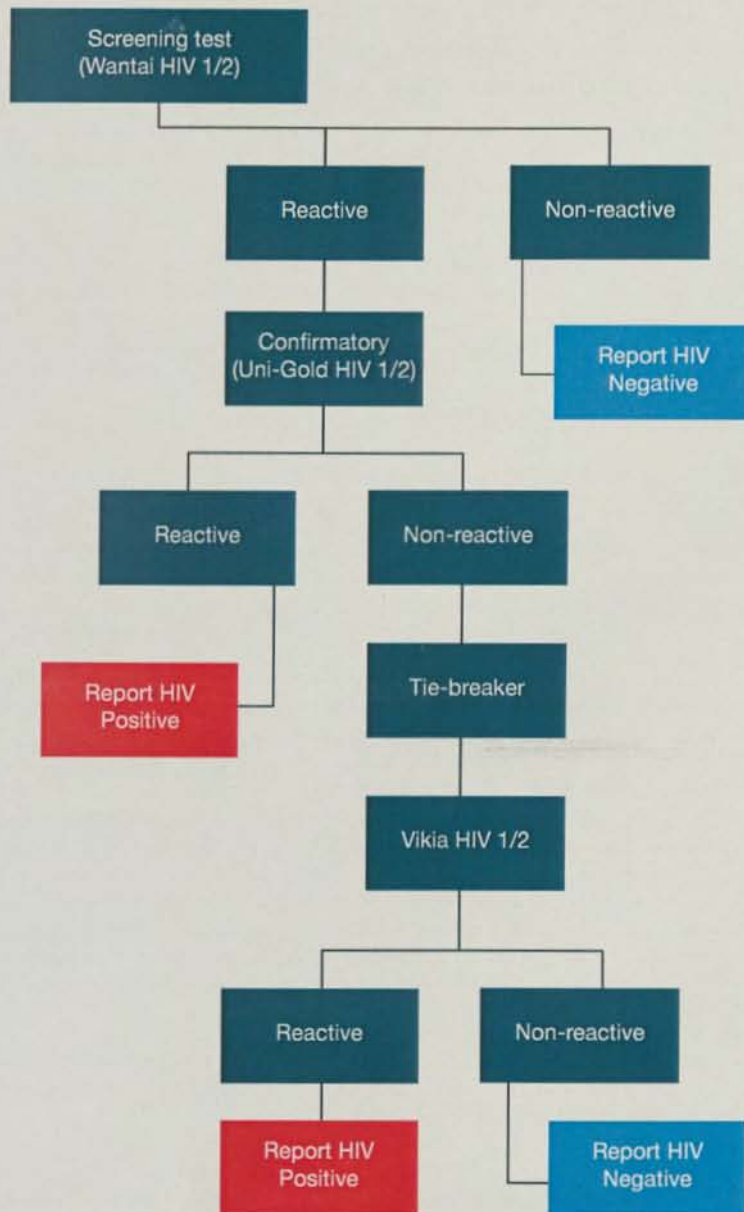
In rare cases where participants were provided an incorrect HIV test result, reported an HIV-positive status but tested HIV negative during the survey, or required additional collection of blood to complete testing, households were revisited by qualified personnel to provide participants with correct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

#### *Quality Assurance and Control*

To control the quality of the performance of HIV rapid tests, field staff conducted testing of a panel of HIV-positive and HIV-negative DTS on a weekly basis. To assure the quality of the performance of field staff conducting HIV testing, proficiency testing using a panel of blinded HIV-positive and HIV-negative DTS was evaluated twice during the course of fieldwork. Additionally, sample re-testing was conducted at a satellite lab for (1) the first 50 samples tested by each field staff member, (2) a random sample of 5% of HIV-negative specimens, and (3) all HIV-indeterminate specimens.

A limitation of the survey was the limited potential of rapid tests to detect low levels of HIV antibodies among people within the serological window of infection and in HIV-positive patients on ART. Participants in these two categories were not expected to be a significant source of bias. However, it is possible that this study did not identify all HIV-exposed infants who would need further PCR testing to verify HIV status. Although the survey used the methodology commonly practiced at the time, studies cited in a recent WHO programmatic update suggest that the use of rapid tests to establish HIV-exposure status may be unreliable in some HIV-infected infants.<sup>1,2,3</sup>

**Figure B.2.A**  
Household-based HIV testing algorithm, over the age of 18 months, EPHIA 2017-2018



### B.3 LABORATORY-BASED PROCEDURES

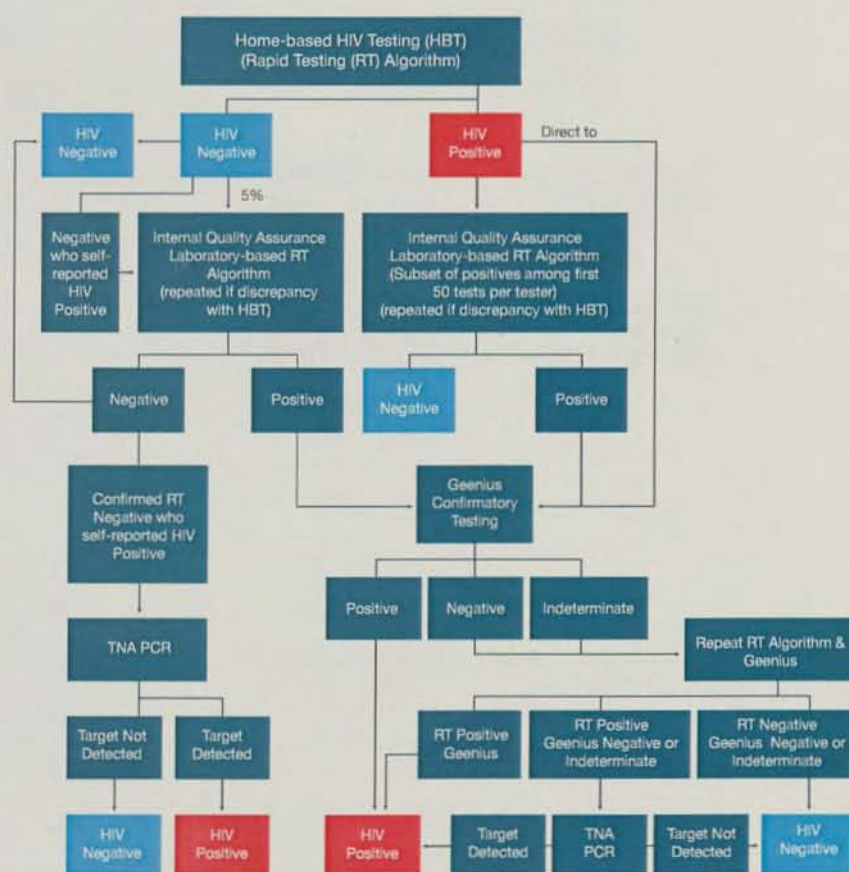
There were 21 survey satellite laboratories established in existing health facility laboratories across the country. One central reference laboratory, EPHI in Addis Ababa, was chosen for more specialized tests.

#### Geenius Testing

All HIV-positive samples, as well as samples with discrepant or indeterminate results, were tested using the Geenius™ HIV 1/2 Supplemental Assay (Bio-Rad, Hercules, California, United States) (Figure B.3.A). Testing was conducted at EPHI in accordance with the manufacturer-specified protocol.

#### Classification of Final HIV Status

For participants aged 18 months or older, the algorithm for classification of final HIV status included results from HIV rapid testing, Geenius testing, and HIV deoxyribonucleic acid (DNA) PCR (Figure B.3.A).



**Figure B.3.A**  
Final HIV Status  
Classification  
Algorithm  
(≥18 months),  
EPHIA 2017–2018

TNA PCR: Total Nucleic Acid polymerase chain reaction.

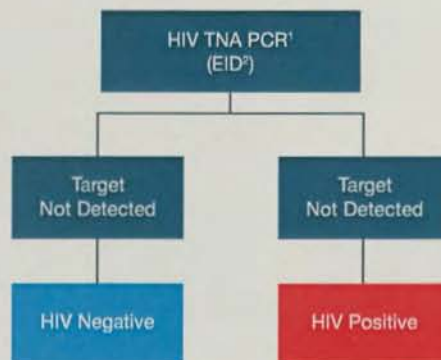
Note: Grey boxes indicate the final HIV status determination.

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

For children below the age of 18 months who had a reactive HIV test result during household-based testing, HIV TNA PCR was conducted (Figure B.3.B). Additionally, HIV TNA PCR was evaluated for participants who reported an HIV-positive status but tested HIV negative during the survey, as well as for samples that were HIV positive by the rapid testing algorithm, but were HIV negative or indeterminate by Geenius testing (Figure B.3.B). Virological testing was conducted via HIV TNA PCR using the Roche TaqMan HIV-1 Qualitative Assay (COBAS® TaqMan® system (Roche Molecular Diagnostics, Branchburg, New Jersey, United States).

For participants aged younger than 18 months, the algorithm for classification of final HIV status included results from HIV rapid testing and HIV TNA PCR. (Note: WHO currently recommends that virological testing be performed on all infants who are HIV exposed; at 4-6 weeks, at 9 months and repeated at the age of 18 months or three months after last breastfeeding, in order to make a final determination of HIV status.)<sup>1,2,3</sup> Classification of final HIV status was used to determine estimates for HIV prevalence and to inform estimates for HIV incidence.

**Figure B.3.B**  
Final HIV Status  
Classification  
Algorithm  
(<18 months),  
CIPHIA 2017-2018



<sup>1</sup>TNA PCR: total nucleic acid polymerase chain reaction;

<sup>2</sup>EID: early infant diagnosis.

### Viral Load Testing

The HIV-1 VL (HIV RNA copies per mL) of confirmed HIV-positive participants was measured from plasma using the Roche (COBAS® AmpliPrep/COBAS® TaqMan® HIV-1 Test (Roche Diagnostics, Indianapolis, Indiana, United States) and from DBS using Abbott m2000 System (Abbott Molecular Inc., Chicago, Illinois, United States). Both instruments consist of two separate instruments, the sample preparation (AmpliPrep and m2000sp, which carries out automated extraction, purification, and preparation of HIV-1 RNA), and the COBAS TaqMan -96 and m2000rt (which amplifies, detects, and measures the HIV-1 RNA load). In COBAS Taqman-96, 1 mL of plasma protocol was used, while the open-mode protocol for the Abbott Real Time HIV-1 assay was used to measure VL from DBS samples from children and adults with insufficient volume of plasma.

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

### **Infant HIV Virological Testing**

For infants younger than 18 months of age who screened positive for HIV during HBTC, virological testing was conducted via HIV TNA PCR using the Roche Taqman HIV-1 Qualitative Assay (COBAS® TaqMan® system (Roche Molecular Diagnostics, Branchburg, New Jersey, United States). Results were returned to a health facility selected by the child's parent or guardian within eight weeks, and the RRC also contacted the parent or guardian via telephone to inform them that the child's results were available at the facility.

### **HIV Recency Testing**

To distinguish recent from long-term HIV infections, in order to estimate incidence, the survey used two different laboratory-based testing algorithms. Each algorithm employed a combination of assays: 1) HIV-1 Limiting Antigen (LAg)-Avidity Enzyme Immunoassay (EIA) (Sedia Biosciences Corporation, Portland, Oregon, United States) and VL (Figure B.3.C) and 2) HIV-1 LAg Avidity EIA, VL, and antiretroviral (ARV) detection (Figure B.3.D).

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

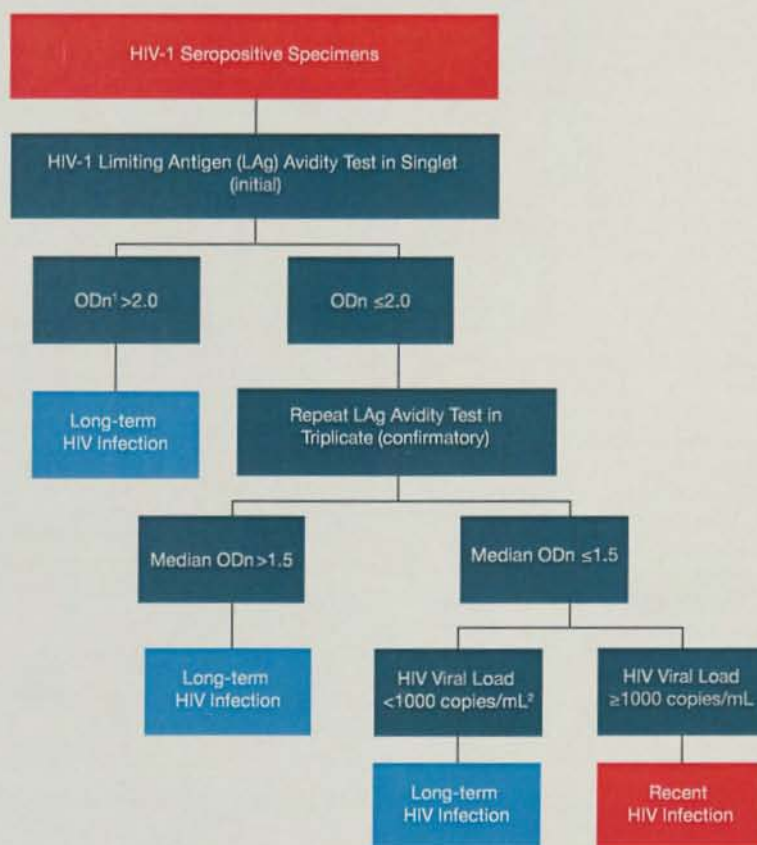
Samples with a median  $ODn \leq 1.5$  were classified as potential HIV-recent infections, and their VL results were assessed. For the first incidence testing algorithm, specimens with  $VL < 1,000$  copies/mL were classified as long-term infections, while those with  $VL \geq 1,000$  copies/mL were classified as recent infections. Specimens with median  $ODn \leq 1.5$  using LAg avidity testing were classified as potential recent infections, and their VL results were assessed. Specimens with  $VL < 1,000$  copies/mL were classified as long-term infections, while those with  $VL \geq 1,000$  copies/mL were classified as recent infections (Figure B.3.C).

In the ARV-adjusted algorithm, specimens with  $VL \geq 1,000$  copies/mL and with detectable ARVs were classified as long-term infections. Specimens with  $VL \geq 1,000$  copies/mL and without detectable ARVs were classified as recent infections (Figure B.3.D). (Note: In EPHIA, one case was reclassified as recent because the participant reported having an initial positive HIV test and ART initiation within three months of the survey interview.)

The HIV recent infection testing algorithms were applied to repository specimens from all confirmed HIV-positive participants aged 18 months and older.

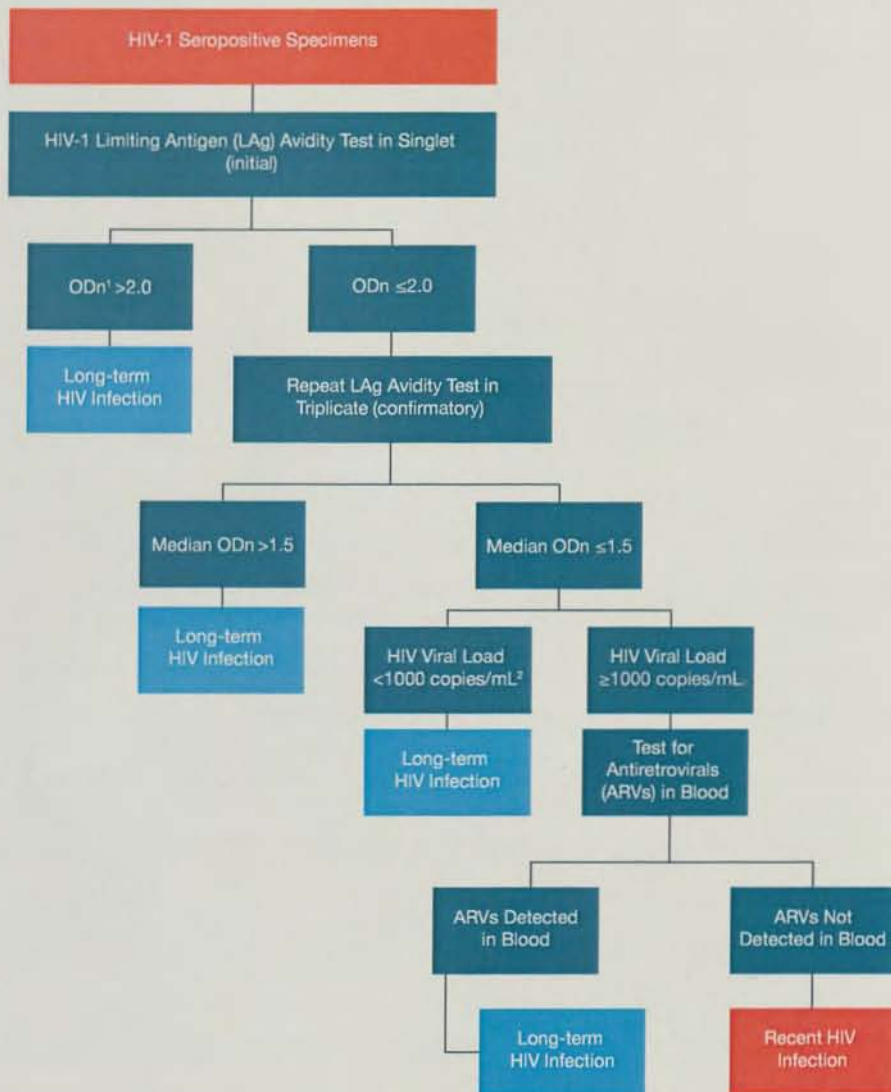
For the updated incidence algorithm, those classified as recent infections by the first algorithm were reclassified using ARV detection data. Those specimens in which efavirenz, lopinavir, and tenofovir were detected were classified as long-term infections and those in which no ARVs were detected remained classified as recent infections.

**Figure B.3.C**  
HIV-1 recent  
infection testing  
algorithm (LAg/VL  
algorithm), EPHIA  
2017-2018



<sup>1</sup>ODn: normalized optical density;

<sup>2</sup>mL: milliliter



**Figure B.3.D**  
HIV-1 recent  
infection testing  
algorithm (LAG-  
VL/ARV algorithm)  
EPHIA 2017-2019

<sup>1</sup>ODn: normalized optical density; <sup>2</sup>mL: milliliter

### HIV Incidence Estimation

Incidence estimates were obtained using the formula recommended by the WHO Incidence Working Group and Consortium for Evaluation and Performance of Incidence Assays. Weighted counts for HIV-negative persons (N); HIV-positive persons (P); number tested on the LAG assay (Q); and numbers HIV recent (R) were provided for use in incidence calculations or the Joint United Nations Programme on HIV/AIDS Spectrum models (Tables B.3.A, B.3.B). Incidence estimates were calculated using the following parameters: MDRI = 130 days (95% CI: 118-142 days); proportion false recent (PFR) = 0.00; time cutoff (T) = 1 year. In-depth details provided in the EPHIA Technical Report, which may be found online on the PHIA Project website.

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

Annual incidence of HIV among adults aged 15-49 and 15-64 years, by sex and age, EPHIA 2017-18												
Age	Male			Female				Total				
	Number HIV negative <sup>1</sup> (N)	Number HIV positive <sup>1</sup> (P)	Number tested on LAg assay <sup>1</sup> (Q)	Number HIV recent <sup>1</sup> (R)	Number HIV negative <sup>1</sup> (N)	Number HIV positive <sup>1</sup> (P)	Number tested on LAg assay <sup>1</sup> (Q)	Number HIV recent <sup>1</sup> (R)	Number HIV negative <sup>1</sup> (N)	Number HIV positive <sup>1</sup> (P)	Number tested on LAg assay <sup>1</sup> (Q)	Number HIV recent <sup>1</sup> (R)
15-24	2741.35	17.65	17.65	0.29	4748.68	39.32	39.32	1.08	7491.83	55.17	55.17	1.25
25-34	2223.13	19.87	19.87	0.00	3275.54	145.46	145.46	1.23	5517.48	146.52	146.52	1.03
35-49	1640.77	71.23	71.23	0.00	2109.82	193.18	193.18	0.96	3764.78	250.22	250.22	0.82
15-49	6599.10	114.90	114.90	0.27	10087.56	424.44	424.44	3.39	16730.84	495.16	495.16	3.13
50-64	788.75	34.25	34.25	0.00	1036.41	50.59	50.59	0.90	1825.71	84.29	84.29	0.81
15-64	7390.04	146.96	146.96	0.28	11123.43	475.57	475.57	4.34	18556.71	579.29	579.29	3.93

<sup>1</sup>Weighted number  
 Note: mean duration recent infection (MDRI) = 130 days (95% CI: 118-142 days); proportion false recent (PFR) = 0.00; time cutoff (T) = 1 year  
 Weighted figures

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

Annual incidence of HIV among persons ages 15-49 and 15-64 years, by sex and age, using LAg+VL+ARVs algorithm, EPHIA 2017-2018												
Age	Male			Female				Total				
	Number HIV negative <sup>1</sup> (N)	Number HIV positive <sup>1</sup> (P)	Number tested on LAg assay <sup>1</sup> (Q)	Number HIV recent <sup>1</sup> (R)	Number HIV negative <sup>1</sup> (N)	Number HIV positive <sup>1</sup> (P)	Number tested on LAg assay <sup>1</sup> (Q)	Number HIV recent <sup>1</sup> (R)	Number HIV negative <sup>1</sup> (N)	Number HIV positive <sup>1</sup> (P)	Number tested on LAg assay <sup>1</sup> (Q)	Number HIV recent <sup>1</sup> (R)
15-24	2741.35	17.65	17.65	0.29	4748.68	39.32	39.32	0.00	7491.83	55.17	55.17	0.40
25-34	2223.13	19.87	19.87	0.00	3275.54	145.46	145.46	1.23	5517.48	146.52	146.52	1.03
35-49	1640.77	71.23	71.23	0.00	2109.82	193.18	193.18	0.96	3764.78	250.22	250.22	0.82
15-49	6599.10	114.90	114.90	0.27	10087.56	424.44	424.44	2.48	16730.84	495.16	495.16	2.38
50-64	788.75	34.25	34.25	0.00	1036.41	50.59	50.59	0.90	1825.71	84.29	84.29	0.81
15-64	7390.04	146.96	146.96	0.28	11123.43	475.57	475.57	3.43	18556.71	579.29	579.29	3.18

<sup>1</sup>Weighted number  
 Note: mean duration recent infection (MDRI) = 130 days (95% CI: 118-142 days); proportion false recent (PFR) = 0.00; time cutoff (T) = 1 year  
 Weighted figures  
 One long-term case according to the LAg+VL+ARV algorithm was reclassified to recent because the respondent indicated in the interview that they started treatment within the recent infection time window

### ***Detection of Antiretrovirals***

To understand recent exposure to ARVs and hence level of ART coverage, samples from all confirmed HIV-positive participants were evaluated for the presence of selected ARVs, using high-resolution liquid chromatography coupled with tandem mass spectrometry to detect ARVs from DBS specimens.<sup>4</sup>

As detection of all ARVs in use at the time of the survey was cost-prohibitive, three ARVs, efavirenz, lopinavir, and tenofovir, were selected as markers for the most commonly prescribed first and second line regimens. Samples from participants who had suppressed viral loads and/or reported being on ART, but had no evidence of the first three compounds, were tested for nevirapine. These ARVs were also selected based on their relatively long half-lives, allowing for a longer period of detection following intake.

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

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

### ***Genotyping for Detection of Antiretroviral Drug Resistance and HIV Subtyping***

To determine the extent of transmitted HIV-1 drug resistance mutations among participants in EPHIA 2017-2018, samples from confirmed HIV-positive infants below the age of 18 months and HIV-positive participants aged 18 months or older who were classified as recent infections, as well as an equal or greater number of whom were classified as long-term infections, were evaluated using a TaqMan<sup>®</sup> SNP Genotyping Assay (Applied Biosystems) to identify mutations within the HIV-1 pol gene region, which encodes amino acid substitutions known to be responsible for resistance to specific ARVs.

Viral RNA or TNA from plasma or DBS was extracted using the NucliSENS<sup>®</sup> easyMAG<sup>®</sup> (bioMerieux, SA, F-69280 Marcy l'Etoile, France) platform. The HIV pol gene was amplified by one-step reverse transcription polymerase chain reaction, which was followed by nested PCR. Sequencing of the approximately one-kilobase amplicons was performed on the ABI 3730 DNA Analyzer (Applied Biosystems, Foster City, California, United States).<sup>5,6,7</sup>

The customized RECall software program was used to edit raw sequences and generate consensus sequences.<sup>8</sup> Mutations in the protease and reverse transcriptase genes were classified as potentially associated with drug resistance, according to the Stanford University HIV Drug Resistance Database.<sup>9</sup> Sequences with >98% homology were flagged for potential cross-contamination or possible epidemiological links. Internal QA measures and in-house QC standards were included in each run, in order to validate results. The assay's sensitivity was established at 1000 copies/mL for plasma and DBS.<sup>9</sup> Sequences were also analyzed for potential cross-contamination by phylogenetic analysis from code 6 of the protease gene to code 251 of the reverse transcriptase gene.

Subtyping of each sample was performed using the REGA HIV-1 & 2 Automated Subtyping Tool.<sup>10, 11, 12</sup> This BioAfrica viral subtyping tool was designed to use phylogenetic methods in order to identify the HIV-1 subtype of a specific sequence. The sequence was analyzed for recombination using boot-scanning methods.

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## APPENDIX C ESTIMATES OF SAMPLING ERRORS

Estimates from sample surveys are affected by two types of errors: non-sampling errors and sampling errors. Non-sampling errors result from mistakes made during data collection (e.g., misinterpretation of an HIV test result) and data management (e.g., transcription errors in data entry). While EPHIA 2017-2018 implemented numerous QA and QC measures to minimize non-sampling errors, these errors are impossible to avoid and difficult to evaluate statistically.

In contrast, sampling errors can be evaluated statistically. The sample of respondents selected for EPHIA 2017-2018 is only one of many samples that could have been selected from the same population, using the same design and expected size. Each of these samples would yield results that differ somewhat from the results of the actual sample selected. Sampling errors are a measure of the variability between all possible samples. Although the degree of variability is not known exactly, it can be estimated from the survey results.

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

EPHIA 2017-2018 utilized a multi-stage stratified sample design, which required complex calculations to obtain sampling errors. Specifically, a variant of the jackknife replication method was implemented in SAS to estimate variance for proportions (e.g., HIV prevalence), rates (e.g., annual HIV incidence), and counts (e.g., numbers of people living with HIV). Each replication considered all but one cluster in the calculation of the estimates. Pseudo-independent replications were thus created. In EPHIA 2017-2018, a jackknife replicate was created by randomly deleting one cluster from each variance-estimation stratum and retaining all of the clusters in the remaining strata. A total of 193 variance-estimation strata were created by pairing (or occasionally tripling) the sample clusters in the systematic order in which they had been selected. Hence, 193 replications were created. The variance of a sample-based statistic,  $y$ , was calculated as follows:

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

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

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

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

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

Sampling errors for selected variables from EPHIA 2017-2018 are presented in tables C.1 through C.8, and sampling errors for all survey estimates may be found online on the PHIA website. For each variable, sampling error tables include the weighted estimate, unweighted denominator, standard error, design effect, and lower and upper 95 percent confidence limits.

Table C.1 Sampling errors: Annual HIV incidence by age, (EPHIA 2017-2018)

Age (years)	Weighted estimate (%)	Design effect	Lower confidence limit (%)	Upper confidence limit (%)
TOTAL				
15-24	0.01	0.20	0.00	0.06
25-34	0.05	0.65	0.00	0.15
35-49	0.06	0.82	0.00	0.19
15-49	0.04	0.77	0.00	0.09
50-64	0.12	0.79	0.00	0.39
15-64	0.05	0.74	0.00	0.10
MALE				
15-24	0.03	0.15	0.00	0.14
25-34	0.00	0.00	0.00	0.46
35-49	0.00	0.00	0.00	0.63
15-49	0.01	0.14	0.00	0.06
50-64	0.00	0.00	0.00	1.30
15-64	0.01	0.14	0.00	0.05
FEMALE				
15-24	0.00	0.00	0.00	0.22
25-34	0.11	0.78	0.00	0.29
35-49	0.13	0.96	0.00	0.38
15-49	0.06	1.08	0.00	0.15
50-64	0.24	0.88	0.00	0.74
15-64	0.09	0.97	0.00	0.18

Note: In strata where the design effect was 0.00, there were no recent infections detected.

Table C.2 Sampling errors: HIV prevalence by age, EPHIA 2017-2018

Ages	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
TOTAL					
0-17 months	0.0	455	0.0	0.0	0.0
18-59 months	0.1	1,136	0.1	0.0	0.4
5-9	0.2	1,529	0.1	0.0	0.4
10-14	0.6	1,609	0.2	0.2	1.1
Total 0-4	0.1	1,591	0.1	0.0	0.3
Total 0-14	0.3	4,729	0.1	0.1	0.5
15-19	0.9	3,924	0.2	0.5	1.2
20-24	0.6	3,623	0.1	0.3	0.9
25-29	1.8	3,509	0.3	1.3	2.4
30-34	3.5	2,155	0.4	2.7	4.4
35-39	5.7	1,908	0.6	4.4	7.0
40-44	7.0	1,228	0.7	5.5	8.6
45-49	6.2	879	0.8	4.6	7.9
50-54	5.8	772	0.9	3.9	7.8
55-59	3.2	565	0.8	1.5	4.9
60-64	3.6	573	0.9	1.8	5.4
Total 15-24	0.7	7,547	0.1	0.5	1.0
Total 15-49	2.9	17,226	0.2	2.5	3.3
Total 50-64	4.4	1,910	0.5	3.4	5.4
Total 15-64	3.0	19,136	0.2	2.6	3.4
MALE					
0-17 months	0.0	263	0.0	0.0	0.0
18-59 months	0.3	566	0.2	0.0	0.8
5-9	0.2	737	0.1	0.0	0.5
10-14	0.5	740	0.3	0.0	1.0
Total 0-4	0.2	829	0.2	0.0	0.5
Total 0-14	0.3	2,306	0.1	0.1	0.5
15-19	1.0	1,473	0.3	0.4	1.6
20-24	0.3	1,286	0.1	0.0	0.6
25-29	0.8	1,340	0.3	0.2	1.5

Table C.2 Sampling errors: HIV prevalence by age, EPHIA 2017-2018 (continued)

Ages	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
TOTAL					
30-34	0.9	903	0.3	0.3	1.5
35-39	2.4	746	0.6	1.2	3.6
40-44	5.7	553	1.1	3.4	8.0
45-49	5.4	413	1.1	3.1	7.8
50-54	5.2	328	1.2	2.6	7.7
55-59	3.5	272	1.2	1.0	6.0
60-64	3.1	223	1.1	0.8	5.4
Total 15-24	0.6	2,759	0.2	0.3	1.0
Total 15-49	1.7	6,714	0.2	1.3	2.1
Total 50-64	4.2	823	0.7	2.8	5.6
Total 15-64	2.0	7,537	0.2	1.5	2.4
FEMALE					
0-17 months	0.0	192	0.0		0.0
18-59 months	0.0	570	0.0	0.0	0.0
5-9	0.2	792	0.2	0.0	0.5
10-14	0.7	869	0.3	0.1	1.4
Total 0-4	0.0	762	0.0	0.0	0.0
Total 0-14	0.3	2,423	0.1	0.1	0.6
15-19	0.7	2,451	0.2	0.3	1.1
20-24	0.9	2,337	0.2	0.5	1.3
25-29	2.8	2,169	0.4	2.0	3.5
30-34	6.1	1,252	0.7	4.6	7.6
35-39	9.1	1,162	1.0	7.1	11.0
40-44	8.4	675	1.1	6.1	10.8
45-49	7.0	466	1.2	4.5	9.6
50-54	6.5	444	1.2	4.0	9.0
54-59	2.8	293	1.2	0.4	5.3
60-64	4.0	350	1.3	1.4	6.7
Total 15-24	0.8	4,788	0.1	0.5	1.1
Total 15-49	4.0	10,512	0.3	3.5	4.6
Total 50-64	4.7	1,087	0.7	3.3	6.0
Total 15-64	4.1	11,599	0.3	3.6	4.7

Table C.3 Sampling errors: HIV prevalence by residence and region, ages 15-64 years, EPHIA 2017-2018

Characteristic	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
<b>Urban area size</b>					
Small (≤50,000)	2.8	9,245	0.3	2.3	3.4
Large (>50,000)	3.2	9,891	0.3	2.5	3.9
<b>Region</b>					
Tigray	2.7	1,369	0.7	1.3	4.0
Afar	4.1	821	1.0	2.1	6.1
Amhara	4.1	2,999	0.5	3.0	5.2
Oromia	3.0	4,510	0.4	2.2	3.8
Somali	0.8	926	0.4	0.0	1.6
Benishangul Gumuz	2.4	798	0.5	1.5	3.4
SNNPR	1.8	2,665	0.4	1.0	2.5
Gambella	5.7	788	1.7	2.2	9.2
Harari	4.6	697	0.7	3.2	6.0
Addis Ababa	3.1	2,780	0.5	2.1	4.0
Dire Dawa	4.6	783	1.2	2.2	7.1
<b>MALE</b>					
<b>Urban area size</b>					
Small (≤50,000)	1.9	3,884	0.3	1.4	2.4
Large (>50,000)	2.0	3,653	0.3	1.3	2.7
<b>Region</b>					
Tigray	0.7	455	0.5	0.0	1.7
Afar	3.6	340	0.8	1.9	5.3
Amhara	2.9	1,214	0.6	1.7	4.2
Oromia	1.9	1,775	0.3	1.3	2.6
Somali	0.5	356	0.5	0.0	1.6
Benishangul Gumuz	1.8	343	0.7	0.2	3.3
SNNPR	1.1	1,218	0.4	0.4	1.8
Gambella	4.0	369	1.3	1.3	6.7
Harari	1.6	265	0.7	0.1	3.0
Addis Ababa	2.0	939	0.6	0.9	3.2
Dire Dawa	3.3	263	1.1	1.1	5.4

Table C.3 Sampling errors: HIV prevalence by residence and region, ages 15-64 years, EPHIA 2017-2018 (continued)

Characteristic	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
FEMALE					
<b>Urban area size</b>					
Small (≤50,000)	3.8	5,361	0.4	3.0	4.6
Large (>50,000)	4.4	6,238	0.4	3.5	5.2
<b>Region</b>					
Tigray	4.1	914	0.8	2.4	5.8
Afar	4.6	481	1.4	1.8	7.4
Amhara	5.4	1,785	0.6	4.1	6.7
Oromia	4.1	2,735	0.6	2.9	5.3
Somali	1.0	570	0.3	0.3	1.7
Benishangul Gumuz	3.2	455	0.6	2.0	4.4
SNNPR	2.6	1,447	0.5	1.5	3.6
Gambella	8.0	419	2.1	3.7	12.2
Harari	7.6	432	1.0	5.6	9.6
Addis Ababa	3.9	1,841	0.5	2.9	4.9
Dire Dawa	5.7	520	1.7	2.3	9.2

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

Table C.4 Sampling errors: Viral load suppression by age, EPHIA 2017-2018

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
TOTAL					
0-14	*	17	11.8	8.2	56.9
15-24	48.2	62	7.3	33.1	63.3
25-34	65.3	175	4.3	56.5	74.1
35-44	72.5	234	3.9	64.4	80.6
45-54	80.2	104	4.6	70.7	89.6
55-64	(72.3)	39	7.8	56.2	88.5
Total 15-24	48.2	62	7.3	33.1	63.3
Total 15-49	68.2	528	2.6	62.8	73.5
Total 50-64	81.7	86	4.3	72.8	90.6
Total 15-64	70.1	614	2.3	65.4	74.8
MALE					
0-14	*	8	16.9	0.0	62.4
15-24	*	21	12.4	17.9	69.0
25-34	*	21	12.3	8.1	58.9
35-44	64.4	55	8.0	47.9	80.8
45-54	(91.8)	39	4.6	82.4	100.0
55-64	*	17	10.0	57.7	98.7
Total 15-24	*	21	12.4	17.9	69.0
Total 15-49	60.6	120	5.6	49.1	72.2
Total 50-64	(90.2)	33	4.8	80.3	100.0
Total 15-64	66.8	153	4.7	57.1	76.4
FEMALE					
0-14	*	9	17.5	1.0	73.0
15-24	(51.9)	41	9.3	32.7	71.0
25-34	71.8	154	3.8	64.0	79.5
35-44	76.1	179	3.7	68.6	83.6
45-54	70.8	65	6.8	56.9	84.8
55-64	*	22	11.1	44.1	90.0
Total 15-24	(51.9)	41	9.3	32.7	71.0
Total 15-49	71.4	408	2.5	66.3	76.4
Total 50-64	74.4	53	6.4	61.2	87.7
Total 15-64	71.7	461	2.2	67.2	76.3

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

Table C.5 Sampling errors: Viral load suppression by residence and region, ages 15-64 years, EPHIA 2017-2018

Characteristic	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
TOTAL					
<b>Urban area size</b>					
Small (≤50,000)	72.1	261	3.5	65.0	79.3
Large (>50,000)	68.4	353	3.0	62.3	74.5
<b>Region</b>					
Tigray	(70.2)	39	6.8	56.2	84.1
Afar	(68.2)	32	7.3	53.1	83.2
Amhara	79.6	118	5.0	69.2	89.9
Oromia	70.0	149	4.3	61.2	78.8
Somali	*	8	10.0	69.3	100.0
Benishangul Gumuz	*	20	5.5	79.5	100.0
SNNPR	(67.2)	49	7.2	52.4	81.9
Gambella	(56.7)	44	8.9	38.3	75.1
Harari	(64.6)	32	7.0	50.3	78.9
Addis Ababa	58.2	88	5.8	46.4	70.1
Dire Dawa	(71.7)	35	10.9	49.3	94.1
MALE					
<b>Urban area size</b>					
Small (≤50,000)	68.6	75	7.6	52.9	84.2
Large (>50,000)	64.9	78	5.5	53.6	76.2
<b>Region</b>					
Tigray	*	3	17.1	35.8	100.0
Afar	*	12	9.7	33.1	73.0
Amhara	(80.4)	33	7.5	65.0	95.7
Oromia	(60.6)	37	10.1	39.9	81.3
Somali	*	2	0.0	100.0	100.0
Benishangul Gumuz	*	6	12.8	58.2	100.0
SNNPR	*	14	14.2	35.3	93.6
Gambella	*	14	14.0	20.8	78.4
Harari	*	4	14.7	53.6	100.0
Addis Ababa	*	20	9.2	38.0	75.7
Dire Dawa	*	8	14.2	45.7	100.0

Table C.5 Sampling errors: Viral load suppression by residence and region, ages 15-64 years, EPHIA 2017-2018 (continued)

Characteristic	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
FEMALE					
<b>Urban area size</b>					
Small (≤50,000)	74.1	186	3.3	67.3	80.9
Large (>50,000)	69.9	275	3.0	63.7	76.0
<b>Region</b>					
Tigray	(70.1)	36	7.4	54.8	85.4
Afar	*	20	9.7	61.1	100.0
Amhara	79.1	85	5.2	68.4	89.7
Oromia	74.4	112	3.7	66.8	82.0
Somali	*	6	14.5	55.6	100.0
Benishangul Gumuz	*	14	5.6	83.1	100.0
SNNPR	(68.6)	35	8.0	52.1	85.1
Gambella	(61.4)	30	8.3	44.3	78.6
Harari	(60.6)	28	7.2	45.9	75.4
Addis Ababa	58.8	68	5.7	47.1	70.5
Dire Dawa	(70.2)	27	9.9	49.8	90.5

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

Table C.6 Sampling errors: Antiretroviral-adjusted 90-90-90 by age (conditional percentages), EPHIA 2017-2018

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
TOTAL					
Diagnosed					
15-24	63.0	62	7.7	47.1	78.9
25-34	79.9	172	4.3	71.0	88.8
35-49	78.8	290	3.0	72.7	85.0
15-49	77.6	524	2.4	72.7	82.5
50-64	87.5	85	4.0	79.3	95.8
15-64	79.0	609	2.1	74.7	83.3
On Treatment					
15-24	(100.0)	39	0.0	100.0	100.0
25-34	95.8	141	1.8	92.0	99.5
35-49	97.5	235	1.1	95.3	99.7
15-49	97.2	415	0.9	95.4	99.0
50-64	96.7	75	2.4	91.8	100.0
15-64	97.1	490	0.8	95.4	98.8

Table C.6 Sampling errors: Antiretroviral-adjusted 90-90-90 by age (conditional percentages), EPHIA 2017-2018 (continued)

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
Viral Load Suppression					
15-24	(74.3)	39	8.5	56.7	91.8
25-34	82.8	135	3.7	75.3	90.4
35-49	90.2	229	2.2	85.7	94.7
15-49	86.6	403	0.9	82.6	90.7
50-64	92.6	73	2.4	86.7	98.5
15-64	87.6	476	0.8	84.1	91.0
MALE					
Diagnosed					
15-24	*	21	12.6	37.2	88.9
25-34	*	21	13.9	17.4	74.6
35-49	70.1	78	6.3	57.2	83.0
15-49	64.9	120	5.3	54.1	75.8
50-64	(89.5)	33	5.6	78.0	100.0
15-64	70.0	153	4.5	60.8	79.2
On Treatment					
15-24	*	12	0.0	100.0	100.0
25-34	*	12	0.0	100.0	100.0
35-49	99.7	58	0.3	99.1	100.0
15-49	99.8	82	0.2	99.4	100.0
50-64	(96.4)	30	3.4	89.4	100.0
15-64	98.9	112	0.9	96.9	100.0
Viral Load Suppression					
15-24	*	12	17.2	33.6	100.0
25-34	*	12	18.0	35.8	100.0
35-49	94.6	57	3.2	88.0	100.0
15-49	88.4	81	4.2	79.7	97.0
50-64	(99.1)	29	0.9	97.2	100.0
15-64	91.1	110	3.1	84.7	97.6
FEMALE					
Diagnosed					
15-24	(63.0)	41	9.3	43.8	82.2
25-34	87.0	151	2.9	81.0	92.9
35-49	83.4	212	2.6	78.1	88.6
15-49	83.0	404	1.9	79.0	87.0
50-64	85.8	52	5.4	74.7	96.8
15-64	83.3	456	1.8	79.7	86.9

Table C.6 Sampling errors: Antiretroviral-adjusted 90-90-90 by age (conditional percentages), EPHIA 2017-2018 (continued)

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
On Treatment					
15-24	(100.0)	27	0.0	100.0	100.0
25-34	95.3	129	2.0	100.0	100.0
35-49	96.5	177	1.5	99.1	100.0
15-49	96.3	333	1.2	99.4	100.0
50-64	(97.1)	45	3.4	89.4	100.0
15-64	96.4	378	1.1	96.9	100.0
Viral Load Suppression					
15-24	(78.4)	27	8.5	60.8	96.0
25-34	84.0	123	3.4	77.1	90.9
35-49	88.2	172	2.7	82.6	93.8
15-49	86.0	322	2.0	81.8	90.2
50-64	(86.7)	44	5.4	75.5	97.9
15-64	86.1	366	1.8	82.3	89.9

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

Table C.7 Sampling errors: Antiretroviral-adjusted 90-90-90 by age (unconditional percentages), EPHIA 2017

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
TOTAL					
Diagnosed					
15-24	63.0	62	7.7	47.1	78.9
25-34	79.9	172	4.3	71.0	88.8
35-49	78.8	290	3.0	72.7	85.0
15-49	77.6	524	2.4	72.7	82.5
50-64	87.5	85	4.0	79.3	95.8
15-64	79.0	609	2.1	74.7	83.3
On Treatment					
15-24	63.0	62	7.7	47.1	78.9
25-34	76.5	172	4.2	67.9	85.2
35-49	76.9	290	3.1	70.5	83.2
15-49	75.4	524	2.4	70.5	80.3
50-64	84.7	85	4.4	75.5	93.8
15-64	76.7	609	2.1	72.4	81.0

Table C.7 Sampling errors: Antiretroviral-adjusted 90-90-90 by age (unconditional percentages), EPHIA 2017 (continued)

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
TOTAL					
Viral Load Suppression					
15-24	46.8	62	7.3	31.8	61.8
25-34	63.4	172	4.2	54.7	72.1
35-49	69.3	290	3.4	62.4	76.3
15-49	65.3	524	2.6	60.1	70.6
50-64	78.4	85	4.7	68.7	88.1
15-64	67.2	609	2.3	62.5	71.9
MALE					
Diagnosed					
15-24	*	21	12.6	37.2	88.9
25-34	*	21	13.9	17.4	74.6
35-49	70.1	78	6.3	57.2	83.0
15-49	64.9	120	5.3	54.1	75.8
50-64	(89.5)	33	5.6	78.0	100.0
15-64	70.0	153	4.5	60.8	79.2
On Treatment					
15-24	*	21	12.6	37.2	88.9
25-34	*	21	13.9	17.4	74.6
35-49	69.9	78	6.3	57.0	82.8
15-49	64.8	120	5.3	53.9	75.7
50-64	(86.2)	33	6.2	73.6	98.9
15-64	69.3	153	4.5	60.0	78.5
Viral Load Suppression					
15-24	*	21	12.4	17.9	69.0
25-34	*	21	12.3	8.1	58.9
35-49	66.2	78	6.2	53.4	79.0
15-49	57.3	120	5.2	46.6	67.9
50-64	(85.5)	33	6.2	72.7	98.2
15-64	63.1	153	4.4	54.0	72.3
FEMALE					
Diagnosed					
15-24	(63.0)	41	9.3	43.8	82.2
25-34	87.0	151	2.9	81.0	92.9
35-49	83.4	212	2.6	78.1	88.6
15-49	83.0	404	1.9	79.0	87.0
50-64	85.8	52	5.4	74.7	96.8
15-64	83.3	456	1.8	79.7	86.9

Table C.7 Sampling errors: Antiretroviral-adjusted 90-90-90 by age (unconditional percentages), EPHIA 2017 (continued)

Age (years)	Weighted estimate (%)	Unweighted number	Standard error (%)	Lower confidence limit (%)	Upper confidence limit (%)
TOTAL					
On Treatment					
15-24	(63.0)	41	9.3	43.8	82.2
25-34	82.9	151	2.9	76.8	89.0
35-49	80.5	212	2.9	74.6	86.4
15-49	79.9	404	2.1	75.7	84.2
50-64	83.2	52	6.0	70.8	95.7
15-64	80.3	456	1.9	76.5	84.1
Viral Load Suppression					
15-24	(49.4)	41	9.3	30.3	68.5
25-34	69.6	151	3.9	61.6	77.7
35-49	71.0	212	3.5	63.8	78.2
15-49	68.8	404	2.6	63.5	74.1
50-64	72.1	52	6.8	58.1	86.2
15-64	69.2	456	2.3	64.4	73.9

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

Table C.8 Sampling errors: Number of new infections annually and number of people living with HIV (ages 15-64 years) EPHIA 2017-2018

	Weighted estimate	Standard error	Lower confidence limit	Upper confidence limit
Number of new infections annually (using the limiting antigen [LAg]/viral load [VL] algorithm)	7,320	3542	12	14629
Number of new infections annually (using LAg/VL/antiretroviral [ARV] algorithm)	5,556	2692	0	11907
Number of people living with HIV	384,011	25339	331824	436199

## APPENDIX D SURVEY INVESTIGATORS AND CONTRIBUTORS

Table D.1 Survey Investigators

Name	Organization
Yimam Getaneh	Ethiopian Public Health Institute
Saro Abdella	Ethiopian Public Health Institute
Wudinesh Belete	Ethiopian Public Health Institute
Tsigereda Kifle	Ethiopian Public Health Institute
Abebe Habteselassie	Ethiopian Public Health Institute
Minilik Demissie	Ethiopian Public Health Institute
G/medhin G/Michael	Ethiopian Public Health Institute
Habtamu Teklie	Ethiopian Public Health Institute
Eleri Seyoum	Federal HIV/AIDS Prevention and Control Office
Esayas Muleta	Central Statistics Agency, Ethiopia
Ebba Abate	Ethiopian Public Health Institute
Frehywot Eshetu	CDC-Ethiopia
Jelaludin Ahmed	CDC-Ethiopia
Clare Dykewicz	CDC-Ethiopia
Ashenafi Haile	CDC-Ethiopia
Yared Tedla	CDC-Ethiopia
<b>Jeff Hanson</b>	CDC-Ethiopia
Christine Ross	CDC-Ethiopia
Biniyam Eskinder	CDC-Ethiopia
Solomon Fekadie	CDC-Ethiopia
Wondimu Teferi	CDC-Ethiopia
Aderonke S. Ajiboye	CDC-Atlanta
Sehin Birhanu	CDC-Atlanta
Kristin Brown	CDC-Atlanta
Edith Nyangoma	CDC-Atlanta
Bharat Parekh	CDC-Atlanta
Hetal Patel	CDC-Atlanta
Drew Voetsch	CDC-Atlanta
Christine West	CDC-Atlanta
Sileshi Lulseged	ICAP in Ethiopia
Zenebe Melaku	ICAP in Ethiopia
Halegnaw Eshete	ICAP in Ethiopia
Terefe Gelibo	ICAP in Ethiopia
Belete Tegbaru	ICAP in Ethiopia
Yohanes Demissie	ICAP in Ethiopia
Nadew Tademe	ICAP in Ethiopia
Jessica Justman	ICAP New York
David Hoos	ICAP New York

Table D.1 Survey Investigators (continued)

Mansoor Farahani	ICAP New York
Karampreet Sachatp	ICAP New York
Suzue Saito	ICAP New York
Andrea Low	ICAP New York
Chelsea Solmo	ICAP New York

Table D.2 Survey Contributors

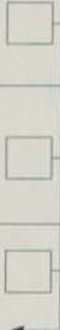
Name	Organization
Eleni Kidane	Ethiopian Public Health Institute
Fitsum Girma	Ethiopian Public Health Institute
Mulu Girma	Ethiopian Public Health Institute
Tefaye Tilahun	Ethiopian Public Health Institute
Ajanaw Yizengaw	Ethiopian Public Health Institute
Mulusew Getahun	Ethiopian Public Health Institute
Sisay Adane	Ethiopian Public Health Institute
Boki Lengeso	Ethiopian Public Health Institute
Nigussie Gezahagn	Ethiopian Public Health Institute
Yohannes Belay	Ethiopian Public Health Institute
Agajie Likie	Ethiopian Public Health Institute
Amelework Yilma	Ethiopian Public Health Institute
Dinknesh Chelchessa	Ethiopian Public Health Institute
Wegayehu Tadele	Ethiopian Public Health Institute
Dawit Chala	Ethiopian Public Health Institute
Desta Kassa	Ethiopian Public Health Institute
Mirtie Getachew	Ministry of Health
Hiwot Solomon	Ministry of Health
Achamyeleh Fentaye	Federal HIV/AIDS Prevention and Control Office
Susan (Neely) Kaydos-Daniels	CDC-Ethiopia
Getinet Abera	CDC-Ethiopia
Dereje Habte	CDC-Ethiopia
Fikirte Yohannes	CDC-Ethiopia
Kussito Kursha	CDC-Ethiopia
Laura Porter	CDC-Atlanta
Wolfgang Hladik	CDC-Atlanta
Steve Kinchen	CDC-Atlanta
Naeemah Logan	CDC-Atlanta

Table D.2 Survey Contributors (continued)

Name	Organization
Steve McCracken	CDC-Atlanta
Paul Stupp	CDC-Atlanta
William Levine	CDC-Atlanta
Carin Molchan	CDC-Atlanta
Katina Pappas-Deluca	CDC-Atlanta
Kat Sleeman	CDC-Atlanta
Mervi Dettori	CDC-Atlanta
Linda Fleming	CDC-Atlanta
Kat Sleeman	CDC-Atlanta
Mervi Dettori	CDC-Atlanta
Thomas Carpino	ICAP New York
Hannah Chung	ICAP New York
Stephen Delgado	ICAP New York
Katherine Evans	ICAP New York
Leticia Froix	ICAP New York
Blair Gilmartin	ICAP New York
Katherine Johnson	ICAP New York
Kiwon Lee	ICAP New York
Jacqueline Maxwell	ICAP New York
Natasha McLeod	ICAP New York
Melissa Metz	ICAP New York
Hugh Siegel	ICAP New York
Mekleet Teferi	ICAP New York
Theo Smart	ICAP New York
Alejandra Villadiego	ICAP New York
John Wylie	ICAP New York
Rachel Bray	ICAP New York
Noelle Esquire	ICAP New York
Sally Findley	ICAP New York
Oren Mayer	ICAP New York
Kristina Parkins	ICAP New York

## APPENDIX E HOUSEHOLD QUESTIONNAIRE

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

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
<input type="checkbox"/>	TICK HERE IF CONTINUATION SHEET USED	<b>CODES FOR COLUMN 3: RELATIONSHIP TO HOUSEHOLD HEAD</b>	
2A)	Just to make sure I have a complete listing, are there any other persons such as small children or infants that we have not listed?	YES <input type="checkbox"/> NO <input type="checkbox"/>	01 = HEAD 02 = WIFE/HUSBAND/ PARTNER 03 = SON OR DAUGHTER 04 = SON-IN-LAW/ DAUGHTER-IN-LAW 05 = GRANDCHILD 06 = PARENT 07 = PARENT-IN-LAW 08 = BROTHER/SISTER 09 = CO-WIFE 10 = OTHER RELATIVE 11 = ADOPTED FOSTER/STEPCHILD 12 = NOT RELATED -8 = DON'T KNOW
2B)	Are there any other people such as domestic servants, lodgers, or friends who may not be members of your household who usually live here?	YES <input type="checkbox"/> NO <input type="checkbox"/>	
2C)	Are there any guests or temporary visitors staying here, or anyone else who stayed here last night who we have not seen?	YES <input type="checkbox"/> NO <input type="checkbox"/>	
	 ADD TO SCHEDULE		

## HOUSEHOLD SCHEDULE (CONTINUED)

LINE NO.	EMANC STATUS	IF (NAME) IS 0-17 YEARS		IF (NAME) IS 0-14 YEARS		RECORD LINE NUMBER OF PARENT/GUARDIAN WHO WILL FILL OUT CHILDREN'S MODULE FOR (NAME)	DO NOT READ: IS (NAME) ELIGIBLE FOR SURVEY?
		ORPHAN STATUS/PARENT OR GUARDIAN					
	Is (NAME) an emancipated minor?		Does ((NAME)'s natural mother usually live in this household or was (NAME) a guest last night?		Does (NAME)'s natural father usually live in this household or was (NAME) a guest last night?		
	Emancipated minor is a person ages 13-17 who is not legally an adult but who, because he or she is married/ previously married, has a baby, is the head of a child-headed household, or otherwise emancipated by an order of the court is considered able to consent.	Is (NAME)'s natural mother alive?	IF YES: RECORD MOTHER'S LINE NUMBER.  IF NO: RECORD FEMALE GUARDIAN'S LINE NUMBER OR '00' IF FEMALE PARENT OR GUARDIAN NOT PRESENT IN HH.	Is (NAME)'s natural father alive?	IF YES: RECORD FATHER'S LINE NUMBER.  IF NO: RECORD MALE GUARDIAN'S LINE NUMBER OR '00' IF MALE PARENT OR GUARDIAN NOT PRESENT IN HH.		
(1)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1	Y N DK	Y N DK ↓ 12	<input type="text"/>	Y N DK ↓ 14	<input type="text"/>	<input type="text"/>	Y N
2	Y N DK	Y N DK ↓ 12	<input type="text"/>	Y N DK ↓ 14	<input type="text"/>	<input type="text"/>	Y N
3	Y N DK	Y N DK ↓ 12	<input type="text"/>	Y N DK ↓ 12	<input type="text"/>	<input type="text"/>	Y N
4	Y N DK	Y N DK ↓ 12	<input type="text"/>	Y N DK ↓ 14	<input type="text"/>	<input type="text"/>	Y N
5	Y N DK	Y N DK ↓ 12	<input type="text"/>	Y N DK ↓ 14	<input type="text"/>	<input type="text"/>	Y N
6	Y N DK	Y N DK ↓ 12	<input type="text"/>	Y N DK ↓ 14	<input type="text"/>	<input type="text"/>	Y N
7	Y N DK	Y N DK ↓ 12	<input type="text"/>	Y N DK ↓ 14	<input type="text"/>	<input type="text"/>	Y N
8	Y N DK	Y N DK ↓ 12	<input type="text"/>	Y N DK ↓ 14	<input type="text"/>	<input type="text"/>	Y N

(1)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
9	Y N DK	Y N DK ↓ 12	<input type="text"/>	Y N DK ↓ 14	<input type="text"/>	<input type="text"/>	Y N
10	Y N DK	Y N DK ↓ 12	<input type="text"/>	Y N DK ↓ 14	<input type="text"/>	<input type="text"/>	Y N
TOTAL ELIGIBLE MEN (ADULTS 15+ YEARS AND EMANCIPATED MINORS)							<input type="text"/>
TOTAL ELIGIBLE WOMEN (ADULTS 15+ YEARS AND EMANCIPATED MINORS)							<input type="text"/>
TOTAL ELIGIBLE CHILDREN (12 TO 14 YEARS)							<input type="text"/>
TOTAL ELIGIBLE CHILDREN (0 MONTHS TO 11 YEARS)							<input type="text"/>

## HOUSEHOLD SCHEDULE (OPTIONAL) (CONTINUED)

IF (NAME) is 18+		IF (NAME) is 0-17 years					
LINE NO.	SICK PERSON	SICKNESS AND RESIDENCE OF BIOLOGICAL PARENTS			MOTHER DEAD OR SICK	FATHER DEAD OR SICK	
	CHECK COLUMNS 7 AND 8, IF UNDER 18 → 17  IF 18 YEARS OR MORE:  Has (NAME) been very sick for at least 3 months during the past 12 months, that is was (NAME) too sick to work or do normal activities?	CHECK COLUMN 10, IF COLUMN 10 'N' OR 'DK' → 21 IF COLUMN 10 'Y': Has (NAME)'s natural mother been very sick for at least 3 months during the past 12 months, that is she was she too sick to work or do normal activities?	IF MOTHER SICK  Does (NAME)'s natural mother has HIV/AIDS?	CHECK COLUMN 12, IF COLUMN 12 'N' OR 'DK' → 23 IF COLUMN 12 'Y':  Has (NAME)'s natural father been very sick for at least 3 months during the past 12 months, that is was he was too sick to work or do normal activities?	IF FATHER SICK  Does (NAME)'s natural father has HIV/AIDS?	IF CHILD'S NATURAL MOTHER HAS DIED (COLUMN 10 'N') OR BEEN SICK (COLUMN 18 'Y'), SELECT Y.	IF CHILD'S NATURAL FATHER HAS DIED (COLUMN 12 'N') OR BEEN SICK (COLUMN 20 'Y'), SELECT Y.
(1)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
1	Y N DK	Y N DK ↓ 19	Y N DK	Y N DK ↓ 21	Y N DK	Y N	Y N
2	Y N DK	Y N DK ↓ 19	Y N DK	Y N DK ↓ 21	Y N DK	Y N	Y N
3	Y N DK	Y N DK ↓ 19	Y N DK	Y N DK ↓ 21	Y N DK	Y N	Y N
4	Y N DK	Y N DK ↓ 19	Y N DK	Y N DK ↓ 21	Y N DK	Y N	Y N
5	Y N DK	Y N DK ↓ 19	Y N DK	Y N DK ↓ 21	Y N DK	Y N	Y N
6	Y N DK	Y N DK ↓ 19	Y N DK	Y N DK ↓ 21	Y N DK	Y N	Y N
7	Y N DK	Y N DK ↓ 19	Y N DK	Y N DK ↓ 21	Y N DK	Y N	Y N
8	Y N DK	Y N DK ↓ 19	Y N DK	Y N DK ↓ 21	Y N DK	Y N	Y N
9	Y N DK	Y N DK ↓ 19	Y N DK	Y N DK ↓ 21	Y N DK	Y N	Y N
10	Y N DK	Y N DK ↓ 19	Y N DK	Y N DK ↓ 21	Y N DK	Y N	Y N

## HOUSEHOLD SCHEDULE (CONTINUED)

LINE  
NO.

## SPOUSES AND CO-HABITATING PARTNERS

Record the LINE  
NUMBER (NAME)'s  
of spouse or partner.  
If no spouse or  
partner leave blank.Record the LINE  
NUMBER (NAME)'s  
of spouse or partner.  
If no spouse or  
partner leave blank.Record the LINE  
NUMBER (NAME)'s  
of spouse or partner.  
If no spouse or  
partner leave blank.Record the LINE  
NUMBER (NAME)'s  
of spouse or partner.  
If no spouse or  
partner leave blank.Record the LINE  
NUMBER (NAME)'s  
of spouse or partner.  
If no spouse or  
partner leave blank.Record the LINE  
NUMBER (NAME)'s  
of spouse or partner.  
If no spouse or  
partner leave blank.

(1)

(23a)

(23b)

(23c)

(23d)

(23e)

(23f)

1

2

3

4

5

6

7

8

9

10

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
-----	----------------------------	-------------------	------

**SUPPORT FOR ORPHANS AND VULNERABLE CHILDREN (OPTIONAL)**

101	DO NOT READ: CHECK COLUMN 7 IN THE HOUSEHOLD SCHEDULE.  ANY CHILD AGE 0-17 YEARS?	NUMBER OF CHILDREN 0-17 YRS:	<table border="1" style="display: inline-table;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> </table>			NONE → 114

102	DO NOT READ: CHECK COLUMN 16 IN THE HOUSEHOLD SCHEDULE.  ANY SICK ADULT AGE 18+ YEARS?	YES _____ 1 NO _____ 2	YES → 105
-----	--	---------------------------	-----------

103	DO NOT READ: CHECK COLUMN 21 IN THE HOUSEHOLD SCHEDULE.  ANY CHILD WHOSE MOTHER HAS DIED OR IS VERY SICK?	YES _____ 1 NO _____ 2	YES → 105
-----	---	---------------------------	-----------

104	DO NOT READ: CHECK COLUMN 22 IN THE HOUSEHOLD SCHEDULE.  ANY CHILD WHOSE FATHER HAS DIED OR IS VERY SICK?	YES _____ 1 NO _____ 2	NO → 114
-----	---	---------------------------	----------

105. **Record names, line numbers, and ages of all children 0-17 who are identified in columns 16, 21, and 22 as having a sick adult in their household or having a mother and/or father who has died or has been very sick.**

	CHILD (1)	CHILD (2)	CHILD (3)
	NAME _____	NAME _____	NAME _____

LINE NUMBER (FROM COLUMN 1)

--	--

--	--

--	--

AGE (FROM COLUMN 7)

--	--

--	--

--	--

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
-----	----------------------------	-------------------	------

**SUPPORT FOR ORPHANS AND VULNERABLE CHILDREN (OPTIONAL) (CONTINUED)**

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

106	Now I would like to ask you about the support your household received for <b>(NAME)</b> .  In the last 12 months, has your household received any medical support for <b>(NAME)</b> , such as medical care, supplies, or medicine, for which you did not have to pay?	YES _____ 1 NO _____ 2 DON'T KNOW _____ -8	
107	In the last 12 months, has your household received any emotional or psychological support for <b>(NAME)</b> , such as companionship, counseling from a trained counselor, or spiritual support, which you received at home and for which you did not have to pay?	YES _____ 1 NO _____ 2 DON'T KNOW _____ -8	NO, DK → 109
108	Did your household receive any of this emotional or psychological support for <b>(NAME)</b> in the past 3 months?	YES _____ 1 NO _____ 2 DON'T KNOW _____ -8	
109	In the last 12 months, has your household received any material support for <b>(NAME)</b> , such as clothing, food, or financial support, for which you did not have to pay?	YES _____ 1 NO _____ 2 DON'T KNOW _____ -8	NO, DK → 111
110	Did your household receive any of this material support for <b>(NAME)</b> in the past 3 months?	YES _____ 1 NO _____ 2 DON'T KNOW _____ -8	
111	In the last 12 months, has your household received any social support for <b>(NAME)</b> such as help in household work, training for a caregiver, or legal services, for which you did not have to pay?	YES _____ 1 NO _____ 2 DON'T KNOW _____ -8	NO, DK → 113

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
112	Did your household receive any of this social support for <b>(NAME)</b> in the past 3 months?	YES _____1 NO _____2 DON'T KNOW _____8	
113	In the last 12 months, has your household received any support for <b>(NAME)</b> 's schooling, such as allowance, free admission, books, or supplies, for which you did not have to pay?	YES _____1 NO, DID NOT RECEIVE SUPPORT _____2 NO, CHILD DOES NOT ATTEND SCHOOL _____3 DON'T KNOW _____8	

SKIP IF  
CHILD < 5 YEARS

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

**SUPPORT FOR ORPHANS AND VULNERABLE CHILDREN (OPTIONAL) (CONTINUED)**

**MATRIX END**

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

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

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

TICK IF CONTINUATION SHEET REQUIRED.

IF NO OTHER CHILDREN, CONTINUE HOUSEHOLD INTERVIEW.

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
-----	----------------------------	-------------------	------

**HOUSEHOLD DEATHS (OPTIONAL)**

114	Now I would like to ask you more questions about your household. Has any usual resident of your household died since January 1, 2015?	YES _____ 1 NO _____ 2 DON'T KNOW _____ -8	NO, DK → 201
-----	---	--	--------------

115	How many usual household residents died since January 1, 2015?	NUMBER OF DEATHS <input type="text"/> <input type="text"/>	
		DON'T KNOW _____ -8	

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

116	What was the name of the person who died (most recently/before him/her)?	NAME 1 <sup>ST</sup> DEATH _____	NAME 2 <sup>ND</sup> DEATH _____	NAME 3 <sup>RD</sup> DEATH _____
-----	--	-------------------------------------	-------------------------------------	-------------------------------------

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

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
<b>HOUSEHOLD DEATHS (OPTIONAL) (CONTINUED)</b>			
118	Was ( <b>NAME</b> ) male or female?	YES _____ 1 NO _____ 2 DON'T KNOW _____ -8	YES _____ 1 NO _____ 2 DON'T KNOW _____ -8
		CURRENT DATE> DATE OF DEATH 1 > JANUARY 1, [INSERT YEAR]	CURRENT DATE> DATE OF DEATH 1 > JANUARY 1, [ INSERT YEAR]
		CURRENT DATE> DATE OF DEATH 1 > JANUARY 1, [INSERT YEAR]	CURRENT DATE> DATE OF DEATH 1 > JANUARY 1, [INSERT YEAR]
119	How old was ( <b>NAME</b> ) when (he/she) died?	DAYS <input type="text"/> <input type="text"/>	DAYS <input type="text"/> <input type="text"/>
	RECORD DAYS IF LESS THAN 1 MONTH, MONTHS IF LESS THAN 1 YEAR, AND COMPLETED YEARS IF 1 YEAR OR MORE.	MONTHS <input type="text"/> <input type="text"/>	MONTHS <input type="text"/> <input type="text"/>
		YEARS <input type="text"/> <input type="text"/>	YEARS <input type="text"/> <input type="text"/>
		DON'T KNOW _____ -8	DON'T KNOW _____ -8

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

TICK IF CONTINUATION SHEET REQUIRED.

#### HOUSEHOLD CHARACTERISTICS

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

201	What is the <u>main</u> source of drinking water for members of your household?	<b>PIPED WATER</b> PIPED INTO DWELLING _____ 11 PIPED TO YARD/PLOT _____ 12 PUBLIC TAP/STANDPIPE _____ 13 TUBE WELL OR BOREHOLE _____ 21  <b>DUG WELL</b> PROTECTED WELL _____ 31 UNPROTECTED WELL _____ 32  <b>WATER FROM SPRING</b> PROTECTED SPRING _____ 41 UNPROTECTED SPRING _____ 42  RAINWATER _____ 51 TANKER TRUCK _____ 61 CART WITH SMALL TANK _____ 71 SURFACE WATER (RIVER/DAM/ LAKE/ POND/STREAM/CANAL) _____ 81 BOTTLED WATER _____ 91 IRRIGATION CHANNEL _____ 95 OTHER _____ 96 (SPECIFY) _____
-----	---	--

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
203	What do you do to make your water safe for drinking?	BOILING _____ 1 FILTRATION (CERAMIC/SAND/ COMPOSITE/CHARCOAL FILTER) _____ 2 SEDIMENTATION (LET IT STAND AND SETTLE) _____ 3 DISINFECTION (WATERGUARD/ BLEACH/CHLORINE) _____ 4 USE BOTTLED WATER _____ 5 STRAIN THROUGH A CLOTH _____ 6 OTHER _____ 96 (SPECIFY) _____ DON'T KNOW _____ -8	
204	What kind of toilet facility do members of your household usually use?	FLUSH OR POUR FLUSH TOILET _____ 11 TRADITIONAL PIT LATRINE _____ 21 VENTILATED IMPROVED PIT LATRINE (VIP) _____ 22 COMPOSTING TOILET _____ 31 BUCKET TOILET _____ 32 HANGING TOILET/LATRINE _____ 33 NO FACILITY/BUSH/FIELD _____ 61 OTHER _____ 96 (SPECIFY) _____	NO FACILITY, OTHER → 207
205	Do you share this toilet facility with other households?	YES _____ 1 NO _____ 2	NO → 207
206	How many households use this toilet facility?	NO. OF HOUSEHOLD IF LESS THAN 10 _____ 10 OR MORE HOUSEHOLDS _____ 96 DON'T KNOW _____ -8	
<b>PREFACE BEFORE QUESTIONS 207-HHX10:</b>			
<b>Does your household have:</b>			
207	Electricity	YES _____ 1 NO _____ 2	
208	A radio	YES _____ 1 NO _____ 2	
209	A television	YES _____ 1 NO _____ 2	
210	A telephone/mobile telephone	YES _____ 1 NO _____ 2	
211	A refrigerator	YES _____ 1 NO _____ 2	

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
202	Do you do anything to the water to make it safer to drink?	YES _____ NO _____ DON'T KNOW _____	1 NO, DK → 204 2 -8
<b>HOUSEHOLD CHARACTERISTICS (CONTINUED)</b>			
HHX1	Freezer	YES _____ NO _____	1 2
HHX1	Computer/Laptop	YES _____ NO _____	1 2
HHX3	A stove	YES _____ NO _____	1 2
HHX4	A microwave	YES _____ NO _____	1 2
HHX5	Home internet connectivity	YES _____ NO _____	1 2
HHX6	A wardrobe	YES _____ NO _____	1 2
HHX7	A sofa	YES _____ NO _____	1 2
HHX8	A bed	YES _____ NO _____	1 2
HHX9	A table and chairs	YES _____ NO _____	1 2
HHX10	Windows with glass	YES _____ NO _____	1 2
212	What type of fuel does your household mainly use for cooking?	ELECTRICITY _____ LPG/NATURAL GAS _____ BIOGAS _____ PARAFFIN / KEROSENE _____ COAL, LIGNITE _____ CHARCOAL FROM WOOD _____ FIREWOOD / STRAW _____ DUNG _____ NO FOOD COOKED IN HOUSEHOLD _____ OTHER _____ (SPECIFY) _____	1 2 3 4 5 6 7 8 9 96

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
HHX11	Is the cooking usually done in the house, in a separate building or outdoors?	HOUSE = 1 SEPARATE BUILDING = 2 OUTDOORS = 3 DON'T KNOW = -8	
HHX12	Do you have a separate room which is used as a kitchen?	YES _____ 1 NO _____ 2 DON'T KNOW _____ -8	
213	MAIN MATERIAL OF FLOOR  RECORD OBSERVATION.	<b>NATURAL FLOOR</b> EARTH / SAND _____ 11 DUNG _____ 12 MUD / CLAY _____ 13  <b>RUDIMENTARY FLOOR</b> WOOD PLANKS _____ 21 PALM / BAMBOO _____ 22  <b>FINISHED FLOOR</b> PARQUET OR POLISHED WOOD _____ 31 VINYL OR ASPHALT STRIP _____ 32 CERAMIC TILES _____ 33 CEMENT/TERAZO _____ 34 CARPET _____ 35 OTHER _____ 96 (SPECIFY) _____	
214	MAIN MATERIAL OF THE ROOF  RECORD OBSERVATION.	<b>NATURAL ROOFING</b> NO ROOF _____ 11 THATCH/PALM LEAF/GRASS _____ 12 DUNG / MUD _____ 13 SO _____ 18  <b>RUDIMENTARY ROOFING</b> RUSTIC MAT _____ 14 WOOD PLANKS _____ 15 CARDBOARD _____ 16 TIN CANS _____ 22 PALM/BAMBOO _____ 25 STICKS WITH MUD AND DUNG _____ 26 PLASTIC/PVC _____ 27  <b>FINISHED ROOFING</b> CORRUGATED IRON _____ 21 WOOD _____ 23 CALAMINE/CEMENT FIBER _____ 24 ASBESTOS SHEET _____ 31 CONCRETE _____ 32 TILES (CERAMIC/BRICK/ETC.) _____ 33 ROOFING SHINGLES _____ 34 TIN _____ 35 SLATE _____ 36 OTHER _____ 96 (SPECIFY) _____	

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
215	MAIN MATERIAL OF THE EXTERIOR WALLS  RECORD OBSERVATION.	<b>NATURAL WALLS</b>	
		NO WALLS _____	11
		CANE/PALM/TRUNKS _____	12
		DIRT _____	16
		<b>RUDIMENTARY WALLS</b>	
		DUNG/MUD/CLAY _____	13
		STICKS WITH MUD/CLAY/DUNG _____	14
		BAMBOO WITH MUD/CLAY/DUNG _____	21
		STONE WITH MUD _____	22
		CARTON _____	24
		REUSED WOOD _____	25
		PLYWOOD _____	26
		CARDBOARD _____	27
		UNCOVERED ADOBE _____	29
		<b>FINISHED WALLS</b>	
		CEMENT _____	31
		STONE WITH LIME/CEMENT _____	32
		BRICKS _____	33
		CEMENT BLOCKS _____	34
		WOOD PLANKS/SHINGLES _____	35
OTHER _____	96		
(SPECIFY) _____			
216	How many rooms are used for sleeping?	NUMBER OF ROOMS: <input type="text"/> <input type="text"/>	
<b>PREFACE BEFORE QUESTIONS 217-HHX14:</b> Does any member of your household own:			
217	A bicycle?	YES _____	1
		NO _____	2
218	A motorcycle or motor scooter?	YES _____	1
		NO _____	2
	A bajaj?	YES _____	1
		NO _____	2
219	A car or truck?	YES _____	1
		NO _____	2
220	A boat with a motor?	YES _____	1
		NO _____	2

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
HHX13	A watch?	YES _____	1
		NO _____	2
HHX14	An animal drawn cart?	YES _____	1
		NO _____	2
<b>PREFACE BEFORE QUESTIONS 221-225: DOES ANY MEMBER OF YOUR HOUSEHOLD OWN:</b>			
221	Cows (Cattle)?	YES _____	1
		NO _____	2 NO→222
221A	Milk cows?	YES _____	1
		NO _____	2
221B	Bulls?	YES _____	1
		NO _____	2
222	Goats/Sheep?	YES _____	1
		NO _____	2
223	Poultry (e.g., ducks, chickens)?	YES _____	1
		NO _____	2
224	Dogs?	YES _____	1
		NO _____	2
225	Other animals (camels, horses, donkeys)?	YES _____	1
		NO _____	2
HHX15	Does any member of household own any agricultural land?	YES _____	1
		NO _____	2 NO → HHX17
HHX16	How many hectares of agricultural land do members of this household own?	HECTARES _____	[]
		DON'T KNOW _____	-8
HHX17	Does any member of this household have an active bank account?	YES _____	1
		NO _____	2

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
<b>MALARIA &amp; FOOD SECURITY (OPTIONAL)</b>			
226*	Does your household have any mosquito nets that can be used while sleeping?	YES _____ 1 NO _____ 2 DON'T KNOW _____ -8 REFUSED _____ 9	
227*	In the past 4 weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	YES _____ 1 NO _____ 2 DON'T KNOW _____ -8	NO, DK → 229
228*	How often did this happen in the past 4 weeks?	RARELY (1-2 TIMES) _____ 1 SOMETIMES (3-10 TIMES) _____ 2 OFTEN (MORE THAN 10 TIMES) _____ 3 DON'T KNOW _____ -8	
229*	In the past 4 weeks, did you or any household member go to sleep at night hungry because there was not enough food?	YES _____ 1 NO _____ 2 DON'T KNOW _____ -8	NO, DK → 231
230*	How often did this happen in the past 6 months?	RARELY (1-2 TIMES) _____ 1 SOMETIMES (3-10 TIMES) _____ 2 OFTEN (MORE THAN 10 TIMES) _____ 3	
231*	In the past 4 weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	YES _____ 1 NO _____ 2 DON'T KNOW _____ -8	NO, DK → 301
232*	How often did this happen in the past 4 weeks?	RARELY (1-2 TIMES) _____ 1 SOMETIMES (3-10 TIMES) _____ 2 OFTEN (MORE THAN 10 TIMES) _____ 3 DON'T KNOW _____ -8	

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
<b>ECONOMIC SUPPORT (OPTIONAL)</b>			
Now I will ask you questions on economic support you have received.			
301	<p>Has your household received any of the following forms of external economic support in the last 12 months?</p> <p>SELECT ALL THAT APPLY. READ THE RESPONSES ALOUD.</p>	<p>NOTHING_____A</p> <p>CASH TRANSFER (E.G. PENSIONS, DISABILITY GRANTS, CHILD GRANT, VETERAN'S GRANT)_____B</p> <p>ASSISTANCE FOR SCHOOL FEES_C</p> <p>MATERIAL SUPPORT FOR EDUCATION (E.G. UNIFORMS, SCHOOL BOOKS, EDUCATION, TUITION SUPPORT,BURSARIES)___D</p> <p>INCOME GENERATION SUPPORT IN CASH OR IN KIND (E.G. AGRIGULTURAL INPUTS) ___E</p> <p>FOOD ASSISTANCE PROVIDED AT THE HOUSEHOLD OR EXTERNAL INSTITUTION_____F</p> <p>MATERIAL OR FINANCIAL SUPPORT FOR SHELTER_____G</p> <p>SOCIAL PENSION_____H</p> <p>OTHER_____X (SPECIFY)_____</p> <p>DON'T KNOW_____Y</p>	<p>NOTHING, DON'T KNOW →END OF SECTION</p>
302	<p>Has your household received any of the following forms of external economic support in the last 3 months?</p> <p>SELECT ALL THAT APPLY. READ THE RESPONSES ALOUD.</p>	<p>NOTHING_____A</p> <p>CASH TRANSFER (E.G. PENSIONS, DISABILITY GRANTS, CHILD GRANT,VETERAN'S GRANT)_____B</p> <p>ASSISTANCE FOR SCHOOL FEES_C</p> <p>MATERIAL SUPPORT FOR EDUCATION (E.G. UNIFORMS, SCHOOL BOOKS, EDUCATION, TUITION SUPPORT,BURSARIES)___D</p> <p>INCOME GENERATION SUPPORT IN CASH OR IN KIND (E.G. AGRIGULTURAL INPUTS)_____E</p> <p>FOOD ASSISTANCE PROVIDED AT THE HOUSEHOLD OR EXTERNAL INSTITUTION_____F</p> <p>MATERIAL OR FINANCIAL SUPPORT FOR SHELTER_____G</p> <p>SOCIAL PENSION_____H</p> <p>OTHER_____X (SPECIFY)_____</p> <p>DON'T KNOW_____Y</p>	

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
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**MOBILITY AND MIGRATION**

Now I will ask you questions about individuals who are part of your household, but may not be living with you right now. By part of your household, we mean individuals listed on the roster.

400A	Are there any members of your household who are not in the country or region right now because of work?	YES _____ 1 NO _____ 2 DON'T KNOW _____ -8	YES → 400B NO, DON'T KNOW → END OF SECTION
------	---	--	---

**HOUSEHOLD SCHEDULE - MIGRATION AND MOBILITY**

**IF (NAME) IS USUAL MEMBER BUT DID NOT SLEEP IN HOUSEHOLD AND IS 18 YEARS OR OLDER**

LINE NUMBER AND NAME	(1)	(401)	(402)	(403)	(404)	(405)
		When was the last time (NAME) slept the night in the household?	IF < 30 DAYS: ASK When do you expect (NAME) to return?	IF 401 plus 402 > 30 DAYS: Is (NAME) in another region or country?	Which region or country is (NAME) in currently? ADDIS ABABA = 01 AFAR = 02 AMHARA = 03 BENSHAN GUL-GUMAZ = 04 DIRE DAWA = 05 GAMBELA PEOPLES = 06 HARARI PEOPLE = 07 OROMIA = 08 SOMALI = 109 SOUTHERN NATIONS, NATIONALITIES AND PEOPLES = 10 TIGRAY = 11 OTHER = 96 DON'T KNOW = -8 REFUSED = -9	What is (NAME's) primary job or activity while away? NONE = 0 MINING = 1 AGRICULTURE/ FARMING = 2 TRANSPORT = 3 CONSTRUCTION = 4 UNIFORMED PERSONNEL = 5 INFORMAL TRADE = 6 GARMENT INDUSTRIES = 7 HOUSEKEEPER = 8 SEX WORK = 9 STUDENT = 10 OTHER = 96 DON'T KNOW = -8 REFUSED = -9
		DAYS <input type="text"/>	DAYS <input type="text"/>	Y N DK Next Line	<input type="text"/>	<input type="text"/>
Name		WEEKS <input type="text"/>	WEEKS <input type="text"/>			
		MONTHS <input type="text"/>	MONTHS <input type="text"/>			
		<input type="text"/>	<input type="text"/>			
		DAYS <input type="text"/>	DAYS <input type="text"/>	Y N DK Next Line	<input type="text"/>	<input type="text"/>
Name		WEEKS <input type="text"/>	WEEKS <input type="text"/>			
		MONTHS <input type="text"/>	MONTHS <input type="text"/>			
		<input type="text"/>	<input type="text"/>			

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES		SKIP		
(1)	(401)	(402)	(403)	(404)	(405)	
Name	DAYS	<input type="checkbox"/>	DAYS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	WEEKS	<input type="checkbox"/>	WEEKS	<input type="checkbox"/>		
	MONTHS	<input type="checkbox"/>	MONTHS	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>			
Name	DAYS	<input type="checkbox"/>	DAYS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	WEEKS	<input type="checkbox"/>	WEEKS	<input type="checkbox"/>		
	MONTHS	<input type="checkbox"/>	MONTHS	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>			

Y N DK  
 ↓  
 Next Line

Y N DK  
 ↓  
 Next Line

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP			
LINE NO.	HOUSEHOLD MEMBERS WHO LIVE ABROAD (OUTSIDE ETHIOPIA)	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	LENGTH OF TIME AWAY	PLACE / COUNTRY	PRIMARY ACTIVITY
	Please give me the names of the any other persons (not noted above) who have lived with you (as household members) during the past 3 years who currently live outside the country.	What is the relationship of (NAME) to the head of the household?  SEE CODES BELOW	Is (NAME) Male or Female?	How long has he/she been away? (MONTHS)	Where (What country) does (NAME) live?	What is (NAME)'s primary job or activity while away?
(406)	(407)	(408)	(409)	(410)	(411)	(412)
1		<input type="text"/>	M F	<input type="text"/>	<input type="text"/>	<input type="text"/>
2		<input type="text"/>	M F	<input type="text"/>	<input type="text"/>	<input type="text"/>
3		<input type="text"/>	M F	<input type="text"/>	<input type="text"/>	<input type="text"/>
4		<input type="text"/>	M F	<input type="text"/>	<input type="text"/>	<input type="text"/>

CODES FOR COLUMN 408: RELATIONSHIP TO HOUSEHOLD HEAD

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

USA=01  
 SAUDI ARABIA=02  
 ISRAEL=03  
 SUDAN=04  
 SOUTH AFRICA=05  
 KENYA=06  
  
 OTHER = 96

NONE = 0  
 MINING = 01  
 AGRICULTURE/FARMING = 02  
 TRANSPORT = 03  
 CONSTRUCTION = 04  
 UNIFORMED PERSONNEL = 05  
 INFORMAL TRADE = 06  
 GARMENT INDUSTRIES = 07  
 HOUSEKEEPER= 08  
 SEX WORK = 09  
 STUDENT = 10  
 OTHER = 96  
 DON'T KNOW = -8  
 REFUSED = -9

NO.	QUESTIONS AND INSTRUCTIONS	CODING CATEGORIES	SKIP
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**END OF HOUSEHOLD INTERVIEW**

INTERVIEWER SAY: "This is the end of the household survey. Thank you very much for your time and for your responses."

END  
TIME

END Record the end time.

HOUR:

--	--

USE 24 HOUR TIME.

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

MINUTES:

--	--

INTERVIEWER OBSERVATIONS:

TO BE COMPLETED AFTER THE INTERVIEW:

COMMENTS ABOUT RESPONDENT:

COMMENTS ABOUT SPECIFIC QUESTIONS:

GENERAL QUESTIONS:

## APPENDIX F ADULT QUESTIONNAIRE

NO	QUESTIONS	CODING CATEGORIES	SKIPS
<b>MODULE 1: RESPONDENT BACKGROUND</b>			
<b>Interviewer says: "Thank you for agreeing to participate in this survey. The first set of questions is about your life in general. Afterwards, we will move on to other topics."</b>			
101	Have you ever attended school?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 105
102	Are you enrolled in school?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	DK, REFUSED → 105
103	What is the highest level of school you attended: primary, secondary or higher?	PRIMARY = 1 SECONDARY = 2 TECHNICAL/VOCATIONAL = 3 HIGHER = 4 DON'T KNOW = -8 REFUSED = -9	
104	What is the highest [class/form/year] you completed at that level?	CLASS/FORM/YEAR ____ DON'T KNOW = -8 REFUSED = -9	
105	Have you done any work in the last 12 months for which you received cash or goods as payment?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 108
106	Have you done any work in the last seven days for which you received cash or goods as payment?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
107	What is your occupation, that is, what kind of work do you mainly do?	PROFESSIONAL/TECHNICAL/ MANAGERIAL = 1 CLERICAL = 2 SALES AND SERVICES = 3 SKILLED MANUAL = 4 UNSKILLED MANUAL = 5 AGRICULTURE = 6 HOUSE WIFE = 7 OTHER = 96 SPECIFY = ____ DON'T KNOW = -8 REFUSED = -9	HOUSE WIFE, DK, REFUSED → 108
108	What is your ethnic group/tribe?	OROMO = 1 AMHARA = 2 TIGRE = 3 AFARI = 4 SOMALI = 5 WELAITA = 6 OTHER = 96 SPECIFY: ____ DON'T KNOW = -8 REFUSED = -9	

NO	QUESTIONS	CODING CATEGORIES	SKIPS
109	What is your religion?	ETHIOPIAN ORTHODOX = 1 MUSLIM = 2 ROMAN CATHOLIC = 3 PROTESTANT = 4 OTHER = 5 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	

**MODULE 2: MARRIAGE**

Interviewer says: "Now I would like to ask you about your current and previous relationships and/or marriages."

201	Have you ever been married or lived together with a [man/woman] as if married?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → END OF MODULE
202	How old were you the first time you married or started living with a [man/woman] as if married?	AGE IN YEARS ____ DON'T KNOW = -8 REFUSED = -9	
203	Have you ever been widowed? That is, did a spouse ever die while you were still married or living with [him/her]?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSE TO ANSWER = -9	
204	What is your marital status now: are you married, living together with someone as if married, widowed, divorced, or separated?	MARRIED = 1 LIVING TOGETHER = 2 WIDOWED = 3 DIVORCED = 4 SEPARATED = 5 DON'T KNOW = -8 REFUSED = -9	WIDOWED, DIVORCED, SEPARATED, DK, REFUSED → END OF MODULE

Interviewer says: "The next several questions are about your current spouse or partner(s)."

205	Altogether, how many wives or live-in partners do you have?	NUMBER OF WIVES OR LIVE-IN PARTNERS ____ DON'T KNOW = -8 REFUSED = -9	DK, REFUSED → END OF MODULE SKIP IF FEMALE
206	The Household Schedule listed [INSERT NUMBER OF REPORTED PARTNERS] household members as your wives/partners. Please review the list below. Are all of the listed household members your wives/partners who live in the household?	YES = 1 NO = 2	NO → 209 SKIP IF FEMALE
207	Is [NAME] your wife/partner?	YES = 1 NO = 2	SKIP IF FEMALE
208	Does [NAME] live in the household?	YES = 1 NO = 2	SKIP IF FEMALE
209	Do you have additional spouse(s)/partner(s) that live with you?	YES = 1 NO = 2	SKIP IF FEMALE

NO	QUESTIONS	CODING CATEGORIES	SKIPS
210	How many additional spouse(s)/ partners(s) live with you?	NUMBER OF SPOUSES OR LIVE-IN PARTNERS ____	SKIP IF FEMALE
211	Please enter the name of your spouse/ partner that lives with you.	NAME OF SPOUSE/PARTNER ____ DON'T KNOW = -8 REFUSED = -9	SKIP IF FEMALE
212	How many wives or live-in partners do you have who live elsewhere?	NUMBER OF ADDITIONAL SPOUSE(S)/PARTNERS ____ DON'T KNOW = -8 REFUSED = -9	SKIP IF FEMALE
213	Is your husband or partner living with you now or is he staying elsewhere?	LIVING TOGETHER = 1 STAYING ELSEWHERE = 2 DON'T KNOW = -8 REFUSE TO ANSWER = -9	STAYING ELSEWHERE, DK, REFUSED → 217  STAYING ELSEWHERE & LISTED PARTNER IN HH ROSTER → 214  SKIP IF MALE
214	The household schedule listed [NAME OF HUSBAND/PARTNER] as your husband/partner who is living here. Is that correct?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	YES DK, REF → 217  SKIP IF MALE
215	Please select the spouse/partner that lives with you.	[LIST OF PERSONS ON HH ROSTER] NOT LISTED IN HOUSEHOLD = 96	LISTED → 217  SKIP IF MALE
216	Please enter the name of your spouse/ partner that lives with you.	NAME OF SPOUSE/PARTNER ____ DON'T KNOW = -8 REFUSED = -9	SKIP IF MALE
217	Does your husband or partner have other wives or does he live with other women as if married?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSE TO ANSWER = -9	NO, DK, REFUSED → END OF MODULE  SKIP IF MALE
218	Including yourself, in total, how many wives or live-in partners does your husband or partner have?	NUMBER OF WIVES OR LIVE-IN PARTNERS ____  DON'T KNOW = -8 REFUSE TO ANSWER = -9	SKIP IF MALE
<b>MODULE 3: REPRODUCTION</b>			
Interviewer says: "Now I would like to ask you questions about your pregnancies and your children."			MALE → 340
301	Have you ever been pregnant?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO → 340

NO	QUESTIONS	CODING CATEGORIES	SKIPS
302	How many times have you been pregnant including a current pregnancy?  CODE '0' IF NONE.	NUMBER OF TIME(S) ____ DON'T KNOW = -8 REFUSED = -9	NONE, DK, REFUSED → 340
303	Have you ever had a pregnancy that resulted in a live birth?  A live birth is when the baby shows signs of life, such as breathing, beating of the heart or movement.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 339
304	How many live births have you had since the 1st of January, 2017?  CODE '0' IF NONE.	NUMBER OF CHILDREN ____ DON'T KNOW = -8 REFUSED = -9	NONE, DK, REFUSED → 339  YEAR IS SURVEY YEAR - 3 YEARS
<b>Interviewer says: "Now I would like to ask you some questions about the last pregnancy that resulted in a live birth since the 1st of January, 2017 [INSERT CURRENT YEAR-3]."</b>			
305	Did your last pregnancy result in birth to twins or more?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REF → 307
306	What is the name of the [INSERT ORDER OF BIRTH] born child from your last pregnancy that resulted in a live birth?  IF THE CHILD WAS NOT NAMED BEFORE DEATH, INPUT BIRTH 1	NAME ____	WILL BE REPEATED FOR EACH MULTIPLE BIRTH
307	What is the name of the child from your last pregnancy that resulted in a live birth?  A live birth is when the baby shows signs of life, such as breathing, beating of the heart or movement. IF THE CHILD WAS NOT NAMED BEFORE DEATH, INPUT BIRTH 1.	NAME ____	
308	When you were pregnant with [your youngest child], did you plan to get pregnant at that time?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
309	When you were pregnant with [NAME], did you visit a health facility for antenatal care?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	YES → 311 DK, REFUSED → 322

NO	QUESTIONS	CODING CATEGORIES	SKIPS
310	What is the main reason you did not visit a clinic for antenatal care when you were pregnant with [NAME]?	CLINIC WAS TOO FAR AWAY = 1 COULD NOT TAKE TIME OFF WORK/TOO BUSY = 2 COULD NOT AFFORD TO PAY FOR THE VISIT = 3 DID NOT TRUST THE CLINIC STAFF = 4 RECEIVED CARE AT HOME = 5 DID NOT WANT AN HIV TEST DONE = 6 HUSBAND/FAMILY WOULD NOT LET ME GO = 7 USED TRADITIONAL BIRTH ATTENDANT/HEALER = 8 COST OF TRANSPORT = 9 RELIGIOUS REASONS = 10 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	ALL → 322
Interviewer says: "I will now be asking you questions on HIV testing. Please remember that your responses will be kept confidential and will not be shared with anyone else."			
311	Have you ever tested for HIV before your pregnancy with [NAME]?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 314
312	Did you test positive for HIV before your pregnancy with [NAME]?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 314
313	At the time of your first antenatal care visit when you were pregnant with [NAME], were you taking ARVs, that is, antiretroviral medications to treat HIV?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	YES → 322 NO, DK, REFUSED → 319  ELECTRONIC AID IF DON'T KNOW
314	During any of your visits to the antenatal care clinic when you were pregnant with [NAME], were you offered an HIV test?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
315	Were you tested for HIV during any of your antenatal care clinic visits when you were pregnant with [NAME]?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO → 317 DK, REFUSED → 322
316	Where were you tested for HIV during your pregnancy with [your youngest child]?	ANC CLINIC = A MATERNITY CLINIC = B VCT = C OTHER = X SPECIFY: _____ DON'T KNOW = Y REFUSED = Z	ALL → 318
	SELECT ALL THAT APPLY		

NO	QUESTIONS	CODING CATEGORIES	SKIPS
317	What is the main reason you were not tested for HIV during antenatal care with [NAME]?	DID NOT WANT AN HIV TEST DONE / DID NOT WANT TO KNOW MY STATUS = 1 DID NOT RECEIVE PERMISSION FROM SPOUSE/FAMILY = 2 AFRAID OTHERS WOULD KNOW ABOUT TEST RESULTS = 3 DID NOT NEED TEST/LOW RISK = 4 NURSES OR TEST KITS NOT AVAILABLE AT TIME OF VISIT = 5 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	ALL → 322
318	What was the result of your last HIV test during your pregnancy with [NAME]?	POSITIVE = 1 NEGATIVE = 2 UNKNOWN/INDETERMINATE = 3 DID NOT RECEIVE RESULTS = 4 DON'T KNOW = -8 REFUSED = -9	NEGATIVE, UNK, NO RESULTS, DK, REF → 322
319	Did you take ARVs during your pregnancy with [NAME] to stop [NAME] from getting HIV?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	YES → 321 DK, REFUSED → 322
320	What was the main reason you did not take ARVs while you were pregnant with [NAME]?	WAS NOT PRESCRIBED = 1 I FELT HEALTHY/NOT SICK = 2 COST OF MEDICATIONS = 3 COST OF TRANSPORT = 4 RELIGIOUS REASONS = 5 WAS TAKING TRADITIONAL MEDICATIONS = 6 MEDICATIONS OUT OF STOCK = 7 DID NOT WANT PEOPLE TO KNOW HIV STATUS = 8 DID NOT RECEIVE PERMISSION FROM SPOUSE/FAMILY = 9 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	ALL → 322
321	How many months pregnant were you when you started taking ARVs? We have an aid to help you if you cannot remember.  SHOW JOB AID IF PARTICIPANT REQUIRES HELP.	MONTHS 1-3/1ST TRIMESTER = 1 MONTHS 4-6/2ND TRIMESTER = 2 MONTHS 7-9/3RD TRIMESTER = 3 DON'T KNOW = -8 REFUSED = -9	
322	Where did you give birth to [NAME]?	AT HOME = 1 AT A HEALTH FACILITY = 2 IN TRANSIT = 3 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	HOME, TRANSIT, OTH, DK, REFUSED → 329

NO	QUESTIONS	CODING CATEGORIES	SKIPS
323	Were you offered an HIV test during labor?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
324	Did you test for HIV during labor?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 329 SKIP IF HIV POSITIVE
325	What was the result of that test?	POSITIVE = 1 NEGATIVE = 2 UNKNOWN/ INDETERMINATE = 3 DID NOT RECEIVE RESULTS = 4 DON'T KNOW = -8 REFUSED = -9	NEG, UNK/INDET, NO RESULTS, DK, REFUSED → 329 SKIP IF HIV POSITIVE
326	During labor, were you offered ARVs to protect [NAME] against HIV?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF ALREADY ON ARVS.
327	During labor, did you take ARVs to protect [NAME] against HIV?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 329 SKIP IF ALREADY ON ARVS.
328	Did you continue to take the ARVs after delivery?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = -9	SKIP IF ALREADY ON ARVS.
329	When did you give birth to [NAME]? Please give your best guess.	DAY ____ DON'T KNOW DAY = -8 REFUSED DAY = -9  MONTH ____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9  YEAR ____ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	
330	Is [NAME] still alive?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	YES, DK, REFUSED → 333 IF MULTIPLE BIRTH ASK 330-338 FOR EACH CHILD.
331	How old was [NAME] when he/she died?  KEY '0' IF CHILD WAS LESS THAN ONE YEAR OLD.	YEARS ____ DON'T KNOW = -8 REFUSED = -9	>0, DK, REF → 335
332	How old was [NAME] in months when he/she died?  KEY '0' IF LESS THAN ONE MONTH OLD.	MONTHS ____ DON'T KNOW = -8 REFUSED = -9	ALL → 335

NO	QUESTIONS	CODING CATEGORIES	SKIPS
333	Is [NAME] living with you?	YES = 1 NO = 2	NO → 335
334	Please select [NAME] that lives with you.  SELECT 'NOT LISTED IN HOUSEHOLD' IF CHILD IS NOT LISTED HERE.	[LIST OF CHILDREN IN HOUSEHOLD] NOT LISTED IN HOUSEHOLD = 96	
335	Did you ever breastfeed [NAME]?	YES = 1 NO, NEVER BREASTFED = 2 NO, CHILD NOT ALIVE = 3 DON'T KNOW = -8 REFUSED = -9	NO, NOT ALIVE, DK, REFUSED → 339
336	For how long did you breastfeed [NAME]?  ONLY ONE OPTION MAY BE SELECTED. FOR EXAMPLE, ANSWER ONLY IN WEEKS OR IN MONTHS.  CODE '00' IF LESS THAN 1 WEEK.	WEEKS ___ MONTHS ___ STILL BREASTFEEDING = 96 DON'T KNOW = -8 REFUSED = -9	
337	Did you continue taking ARVs while you were breastfeeding [your youngest child]?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF ONLY ONE TIME MED. SKIP IF HIV NEGATIVE. SKIP IF NOT TAKING ARVS
338	Thank you for the information regarding [NAME].  DID THE RESPONDENT HAVE MORE THAN ONE CHILD (I.E. TWINS, TRIPLETS)?	YES = 1 NO = 2	YES → RETURN TO 330 FOR MULTIPLES
<b>Interviewer says: "I will now ask about current pregnancies."</b>			
339	Are you pregnant now?	YES = 1 NO = 2 DON'T KNOW/UNSURE = -8 REFUSED = -9	NO, DK, REFUSED → END OF MODULE
<b>Interviewer says: "I will now ask you about family planning."</b>			
340	Are you or your partner currently doing something or using any method to delay or avoid getting pregnant?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → END OF MODULE

NO	QUESTIONS	CODING CATEGORIES	SKIPS
341	Which method are you or your partner using?  SELECT ALL THAT APPLY.	FEMALE STERILIZATION = A MALE STERILIZATION = B PILL = C IUD/"COIL" = D INJECTIONS = E IMPLANT = F MALE CONDOM = G FEMALE CONDOM = H RHYTHM/NATURAL METHODS = I WITHDRAWAL = J NOT HAVING SEX = K LACTATIONAL/AMENORRHEA = L OTHER = X SPECIFY: _____ DON'T KNOW = Y REFUSED = Z	

**MODULE 4: CHILDREN**

THE HOUSEHOLD SCHEDULE NOTED THAT [NAME OF PARTICIPANT] WILL FILL OUT THE CHILDREN'S MODULE FOR [NUMBER OF CHILDREN].

I am going to ask you a number of questions about your child/children regarding their health and where they get their health services. We will ask you about these children:

LIST OF HOUSEHOLD MEMBERS FOR DISPLAY ONLY, DO NOT SELECT [LIST OF CHILDREN]

401	New I am going to ask you questions for [NAME].  THE CHILD NAMED [NAME] WAS LISTED WITH LINE NUMBER [INSERT HH LINE NUMBER] IN THE HOUSEHOLD LISTING.		
402	How old was [NAME] at his/her last birthday?  KEY '0' IF CHILD IS LESS THAN ONE YEAR OLD AT PRESENT.	YEARS ____ DON'T KNOW = -8 REFUSED = -9	>5, DK, REF → 403  1-5 → 402B  AGE CANNOT BE GREATER THAN 14 YEARS.
402A	How old is [NAME] in months?	MONTHS ____	
402B	You said that [NAME] was [KIDAGEY*]. How many months over [KIDAGEY*] is [NAME]?	MONTHS ____	
403	Is [NAME] a boy or girl?	BOY = 1 GIRL = 2 DON'T KNOW = -8 REFUSED = -9	
404	Is [NAME] enrolled in school?	YES = 1 NO, CURRENTLY NOT IN SCHOOL = 2 NO, TOO YOUNG TO BE IN SCHOOL = 3 DON'T KNOW = -8 REFUSED = -9	NO, CURR NOT IN SCHOOL → 407  NO, TOO YOUNG, DK, REFUSED → 412

NO	QUESTIONS	CODING CATEGORIES	SKIPS
405	During the last school week, did [NAME] miss any school days for any reason?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 407
406	Why did [NAME] miss school?  SELECT ALL THAT APPLY.	NO MONEY FOR SCHOOL MATERIALS, TRANSPORT = A CHILD WAS TOO SICK TO ATTEND SCHOOL = B SCHOOL IS TOO FAR AWAY/NO SCHOOL NEARBY = C CHILD HAS TO WORK = D CHILD HAS TO CARE FOR HOUSEHOLD MEMBERS = E CHILD DOES NOT LIKE/WANT TO GO TO SCHOOL = F SCHOOL WAS NOT IN SESSION = G CHILD WAS MENSTRUATING (FOR GIRLS) = F FAMILY DOESN'T THINK THE CHILD NEEDS TO GO TO SCHOOL = G OTHER = X SPECIFY: _____ DON'T KNOW = Y REFUSED = Z	
407	What is the highest level of school [NAME] has attended: primary or secondary?	PRIMARY = 1 SECONDARY = 2 DON'T KNOW = -8 REFUSED = -9	DK, REF → 412
408	What grade/form/year is [NAME] in now?	GRADE/FORM/YEAR ____ DON'T KNOW = -8 REFUSED = -9	ALL → 411
409	Was [NAME] enrolled in school during the previous school year?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REF → 411
410	What grade/form/year was [NAME] during the previous school year?	GRADE/FORM/YEAR ____ DON'T KNOW = -8 REFUSED = -9	
411	What is the highest grade/form/year that [NAME] has completed?	GRADE/FORM/YEAR ____ CHILD HAS NOT COMPLETED ANY = 96 DON'T KNOW = -8 REFUSED = -9	
412	Is [NAME] circumcised? (ye wend lej gerezat)  Circumcision is the complete removal of the foreskin from the penis. If you feel comfortable, I can show you a picture of a completely circumcised penis.  SHOW JOB AID TO PARTICIPANT.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF FEMALE CHILD.  NO → 415  DK, REF → 420

NO	QUESTIONS	CODING CATEGORIES	SKIPS
413	<p>How old was [NAME] when he was circumcised? Please give your best guess.</p> <p>ONLY ONE OPTION MAY BE SELECTED. FOR EXAMPLE, ANSWER ONLY IN YEARS OR IN MONTHS.</p> <p>CODE '0' IF LESS THAN ONE MONTH.</p>	<p>MONTHS ____</p> <p>YEARS ____</p> <p>DON'T KNOW = -8</p> <p>REFUSED = -9</p>	SKIP IF FEMALE CHILD.
414	Who circumcised [NAME]?	<p>DOCTOR, CLINICAL OFFICER, OR NURSE, MIDWIFE = 1</p> <p>TRADITIONAL PRACTITIONER/ CIRCUMCISER/TRADITIONAL BIRTH ATTENDANT = 2</p> <p>FAMILY/FRIEND = 3</p> <p>OTHER = 96</p> <p>SPECIFY: _____</p> <p>DON'T KNOW = -8</p> <p>REFUSE TO ANSWER = -9</p>	<p>SKIP IF FEMALE CHILD.</p> <p>ALL → 420</p>
415	Are you planning to have [NAME] circumcised in the future?	<p>YES = 1</p> <p>NO = 2</p> <p>DON'T KNOW = -8</p> <p>REFUSED = -9</p>	SKIP IF FEMALE CHILD. SKIP IF [NAME] HAS ALREADY BEEN CIRCUMCISED
416	<p>Is [NAME] circumcised? (yeset gerezat)</p> <p>Female circumcision is the cutting or removal of flesh from the female genital area, and may include sewing the genital area shut after cutting.</p>	<p>YES = 1</p> <p>NO = 2</p> <p>DON'T KNOW = -8</p> <p>REFUSED = -9</p>	<p>SKIP IF MALE CHILD.</p> <p>NO → 419</p> <p>DK, REF → 420</p>
417	<p>How old was [NAME] when she was circumcised? Please give your best guess.</p> <p>ONLY ONE OPTION MAY BE SELECTED. FOR EXAMPLE, ANSWER ONLY IN YEARS OR IN MONTHS.</p> <p>CODE '0' IF LESS THAN ONE MONTH.</p>	<p>MONTHS ____</p> <p>YEARS ____</p> <p>DON'T KNOW = -8</p> <p>REFUSED = -9</p>	SKIP IF MALE CHILD.
418	Who circumcised [NAME]?	<p>DOCTOR, CLINICAL OFFICER, MIDWIFE OR NURSE = 1</p> <p>TRADITIONAL PRACTITIONER/ CIRCUMCISER/TRADITIONAL BIRTH ATTENDANT = 2</p> <p>FAMILY/FRIEND = 3</p> <p>OTHER = 96</p> <p>SPECIFY: _____</p> <p>DON'T KNOW = -8</p> <p>REFUSE TO ANSWER = -9</p>	<p>SKIP IF MALE CHILD.</p> <p>ALL → 420</p>

NO	QUESTIONS	CODING CATEGORIES	SKIPS
419	Are you planning to have [NAME] circumcised in the future?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF MALE CHILD. SKIP IF [NAME] HAS ALREADY BEEN CIRCUMCISED
420	Has [NAME] seen a doctor, health officer or nurse in a health facility in the last 12 months?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED →
421	Has [NAME] ever been tested for HIV?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	YES → 424 DK, REFUSED → 450
422	Why has [NAME] never been tested for HIV?  SELECT ALL THAT APPLY.	DON'T KNOW WHERE TO TEST = A TEST COSTS TOO MUCH = B TRANSPORT COSTS TOO MUCH = C TOO FAR AWAY = D AFRAID OTHERS WILL KNOW ABOUT TEST RESULTS = E DON'T NEED TEST/LOW RISK = F DID NOT RECEIVE PERMISSION FROM SPOUSE/FAMILY = G AFRAID SPOUSE/PARTNER/FAMILY WILL KNOW RESULTS = H DON'T WANT TO KNOW CHILD HAS HIV = I CANNOT GET TREATMENT FOR HIV = J TEST KITS NOT AVAILABLE = K RELIGIOUS REASONS = L OTHER = X SPECIFY: _____ DON'T KNOW = Y REFUSED = Z	ALL → 450
423	Where has [NAME] been tested for HIV?  SELECT ALL THAT APPLY.	IN-PATIENT WARD = A OUTPATIENT WARD = B VCT CLINIC = C NUTRITION CLINIC = D TB CLINIC = E IMMUNIZATION CLINIC = F PRIMARY HEALTH CLINIC = G OTHER = X SPECIFY: _____ DON'T KNOW = Y REFUSED = Z	
424	What month and year was [NAME]'s last HIV test done?	MONTH ____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9  YEAR ____ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	DATE RESTRAINTS

NO	QUESTIONS	CODING CATEGORIES	SKIPS
425	What was [NAME]'s last HIV test result?	POSITIVE = 1 NEGATIVE = 2 UNKNOWN/ INDETERMINATE = 3 DID NOT RECEIVE RESULTS = 4 DON'T KNOW = -8 REFUSED = -9	IF NEG, UNK/INDET, DID NOT RECEIVE, DK, REFUSED → 450
426	What was the month and year of [NAME]'s first HIV positive test result? Please give your best guess.  This will be the very first HIV positive test result that you have received.  PROBE TO VERIFY DATE.	MONTH ____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9  YEAR ____ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	
427	Has [NAME] ever received HIV medical care from a doctor, clinical officer or nurse?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	YES → 429 DK, REFUSED → 432
428	What is the main reason why [NAME] has never seen a doctor, clinical officer, or nurse for HIV medical care?	FACILITY IS TOO FAR AWAY = 1 I DON'T KNOW WHERE TO GET HIV MEDICAL CARE FOR CHILD = 2 COST OF CARE = 3 COST OF TRANSPORT = 4 I DON'T THINK CHILD NEEDS IT, HE/SHE IS NOT SICK = 5 I FEAR PEOPLE WILL KNOW THAT CHILD HAS HIV IF I TAKE HIM/HER TO A CLINIC = 6 RELIGIOUS REASONS = 7 CHILD IS TAKING TRADITIONAL MEDICINE = 8 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	ALL → 432
429	What month and year did [NAME] first see a doctor, clinical officer or nurse for HIV medical care?  PROBE TO VERIFY DATE.	MONTH ____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9  YEAR ____ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	
430	What month and year did [NAME] last see a doctor, clinical officer or nurse for HIV medical care?	MONTH ____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9  YEAR ____ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	IF <7 MONTHS, DK, REFUSED, MISSING DATE → 432

NO	QUESTIONS	CODING CATEGORIES	SKIPS
431	What is the main reason for [NAME] not seeing a doctor, clinical officer or nurse for HIV medical care for more than 6 months?	FACILITY IS TOO FAR AWAY = 1 I DON'T KNOW WHERE TO GET HIV MEDICAL CARE FOR CHILD = 2 COST OF CARE = 3 COST OF TRANSPORT = 4 I DON'T THINK CHILD NEEDS IT, HE/SHE IS NOT SICK = 5 I FEAR PEOPLE WILL KNOW THAT CHILD HAS HIV IF I TAKE HIM/HER TO A CLINIC = 6 RELIGIOUS REASONS = 7 CHILD IS TAKING TRADITIONAL MEDICINE = 8 NO APPOINTMENT SCHEDULED/ DID NOT MISS MOST RECENT APPOINTMENT = 9 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	
432	Has [NAME] ever had a CD4 count test? The CD4 count tells you how sick you are with HIV and if you need to take ARVs or other HIV medications.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 434
433	What month and year was [NAME] last tested for his/her CD4 count?	MONTH ____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9  YEAR ____ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	
434	Did [NAME] ever have a viral load test?  This is a test that measures how much HIV is in your blood.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED →  IN HIV CARE OR TREATMENT ONLY.
435	When did [NAME] last have a viral load test?	MONTH ____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9  YEAR ____ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	IN HIV CARE OR TREATMENT ONLY
436	Were you told the result of [NAME]'s viral load test?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	IN HIV CARE OR TREATMENT ONLY

NO	QUESTIONS	CODING CATEGORIES	SKIPS
437	Has [NAME] ever taken ARVs, that is, antiretroviral medications to treat his/her HIV infection?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	YES → 439 DK, REFUSED → 443
438	What is the main reason [NAME] has never taken ARVs?	CHILD IS NOT ELIGIBLE FOR TREATMENT = 1 HEALTH CARE PROVIDER DID NOT PRESCRIBE = 2 HIV MEDICINES NOT AVAILABLE = 3 DO NOT THINK CHILD NEEDS IT, HE/SHE IS NOT SICK = 4 COST OF MEDICATIONS = 5 COST OF TRANSPORT = 6 RELIGIOUS REASONS = 7 CHILD IS TAKING TRADITIONAL MEDICATIONS = 8 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	ALL → 443
439	What month and year did [NAME] first start taking ARVs? PROBE TO VERIFY DATE.	MONTH = ____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9  YEAR = ____ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	
440	Is [NAME] currently taking ARVs, that is, antiretroviral medications?  By currently, I mean that [NAME] may have missed some doses but [NAME] is still taking ARVs.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	YES → 442 DK, REFUSED → 443
441	Can you tell me the main reason why [NAME] is not currently taking ARVs?	I HAVE TROUBLE GIVING CHILD A TABLET EVERYDAY = 1 CHILD HAD SIDE EFFECTS/ RASH = 2 FACILITY/PHARMACY TOO FAR AWAY TO GET MEDICATION REGULARLY = 3 COST OF MEDICATIONS = 4 COST OF TRANSPORT = 5 CHILD IS HEALTHY/, HE/SHE IS NOT SICK = 6 FACILITY WAS OUT OF STOCK = 7 RELIGIOUS REASONS = 8 CHILD IS TAKING TRADITIONAL MEDICATIONS = 9 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	ALL → 443

NO	QUESTIONS	CODING CATEGORIES	SKIPS
442	People sometimes forget to take all their ARVs every day. In the last 30 days, how many days has [NAME] missed taking any ARV pills? CODE '00' IF NONE.	DAYS _____ DON'T KNOW = -8 REFUSED = -9	
443	Is [NAME] currently taking Bactrim or cotrimoxazole?  Bactrim or cotrimoxazole is a medicine recommended for people with HIV, even if they have not started treatment for HIV. It helps prevent certain infections but it is not treatment for HIV.  By currently, I mean that [NAME] may have missed some doses but is still taking Bactrim or cotrimoxazole.	YES = 1 NO = 2 I DON'T KNOW WHAT IT IS = 3 REFUSED = -9	YES, DK, REFUSED → 445
444	Can you tell me the main reason why [NAME] is not currently taking Bactrim or Cotrimoxazole daily?	WAS NOT PRESCRIBED = 1 I HAVE TROUBLE GIVING CHILD A TABLET EVERYDAY = 2 CHILD HAD SIDE EFFECTS/RASH= 3 FACILITY/PHARMACY TOO FAR AWAY TO GET BACTRIM OR COTROMOXIAZOLE REGULARLY= 4 CHILD DOES NOT NEED IT,HE/SHE IS NOT SICK = 5 PHARMACY/ FACILITY WAS OUT OF STOCK = 6 COST OF MEDICATIONS = 7 COST OF TRANSPORT = 8 DOCTOR SAID NO LONGER NEEDED = 9 OTHER =96 SPECIFY: _____ I DON'T KNOW = -8 REFUSED = -9	
445	At the last clinic visit, did a doctor, health officer or nurse, ask if [NAME] had the following tuberculosis or TB symptoms: PERSISTENT COUGH, FEVER, NIGHT SWEATS, WEIGHTLOSS?  SELECT ALL THAT APPLY	PERSISTENT COUGH = A FEVER = B NIGHT SWEATS = C WEIGHT LOSS = D DON'T KNOW = Y REFUSED = Z	SKIP IF 427 = NO, DK, REFUSED
446	At the last clinic visit, did a doctor, health officer or nurse, ask if [NAME] had been exposed to someone who had TB?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF 427 = NO, DK, REFUSED
447	Has [NAME] ever taken a medicine called Isoniazid, IPT or INH to prevent developing TB?  Isoniazid is medication that prevents TB. It is given to people with HIV or people who are in contact with someone with TB.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 449

NO	QUESTIONS	CODING CATEGORIES	SKIPS
448	Is [NAME] currently taking INH, IPT or Isoniazid?  By currently, I mean that [NAME] may have missed some doses but is still taking INH.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
449	Did [NAME] ever receive a box that may have contained items for his or her HIV care?  These items may have included a mosquito net, water guard, a clean water vessel, a filter cloth, and educational materials.	YES = 1 NO=2 DON'T KNOW = -8 REFUSED = -9	
450	Has [NAME] ever visited a clinic for tuberculosis for TB diagnosis or treatment?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
451	Have you ever been told by a doctor, clinical officer or nurse that [NAME] had TB?	YES = 1 NO=2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → END OF MODULE
452	Was [NAME] ever treated for TB?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → END OF MODULE
453	Is [NAME] currently on treatment for TB?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 455
454	The last time [NAME] was treated for TB, did [NAME] complete at least 6 months of treatment?	YES = 1 NO = 2 REFUSED = -9	
455	Thank you for the information about [NAME].  DOES THE RESPONDENT HAVE ANOTHER CHILD AGED 0-14 YEARS?	YES = 1 NO = 2	YES → RETURN TO 401
<b>MODULE 5A: MALE CIRCUMCISION</b>			
Interviewer says: "I will be asking a few questions about circumcision. Circumcision is the complete removal of the foreskin from the penis. If you feel comfortable, I can show you a picture of a completely circumcised penis."			ELECTRONIC AID IF REQUESTED. FEMALES SKIP TO MODULE 5B
501	Some men are uncomfortable talking about circumcision but it is important for us to have this information. Some men are circumcised. Are you circumcised?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED=9	YES, DK, REF → END OF MODULE

NO	QUESTIONS	CODING CATEGORIES	SKIPS
502	Are you planning to get circumcised?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = -9	ALL → END OF MODULE.
503	How old were you when you were circumcised? Please give your best guess.  IF LESS THAN ONE YEAR, CODE '00'.	AGE IN YEARS ____ DON'T KNOW = 8 REFUSED = -9	
504	Who did the circumcision?	DOCTOR, NURSE, HEALTH OFFICER, MIDWIFE = 1 TRADITIONAL HEALER/ TRADITIONAL CIRCUMCISER/ TRADITIONAL BIRTH ATTENDANT = 2 FAMILY/FRIENDS = 3 OTHER = 96 SPECIFY: _____ DON'T KNOW = 8 REFUSED = -9	

#### MODULE 5B: FEMALE CIRCUMCISION AND TRADITIONAL BODY MODIFICATION

Interviewer says: "I will be asking a few questions about female circumcision. Female circumcision is the cutting or removal of flesh from the female genital area, and may include sewing the genital area shut after cutting."

ELECTRONIC AID IF REQUESTED.

MALES SKIP

505	Some women are uncomfortable talking about female circumcision but it is important for us to have this information. Some women are circumcised. Have you ever been circumcised? (yeset gerezat for women)	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = 9	YES → 507  DK, REF → END OF MODULE
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506	Are you planning to get circumcised?	YES = 1 NO = 2 DON'T KNOW = 8 REFUSED = -9	ALL → END OF MODULE.
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507	How old were you when you were circumcised? Please give your best guess.  IF LESS THAN ONE YEAR, CODE '00'.	AGE IN YEARS ____ DON'T KNOW = 8 REFUSED = -9	
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NO	QUESTIONS	CODING CATEGORIES	SKIPS
508	Who did the circumcision?	DOCTOR, NURSE, HEALTH OFFICER, MIDWIFE = 1 TRADITIONAL PRACTITIONER/ TRADITIONAL BIRTH ATTENDANT = 2 FAMILY/FRIENDS = 3 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	
<b>Interviewer says: "I will be asking a few questions about traditional body modification procedures."</b>			
509	Have you had any of the following traditional procedures?  READ THE PROCEDURES OUT ONE BY ONE CHECK ALL THAT APPLY	UVULECTOMY (ENTEL MEGURET) = A GUM CUTTING (GEG MEBUWATET) = B SCARIFICATION (MEBTAT) = C TATOOING = D BODY PIERCING = E NONE OF THESE = F DON'T KNOW = Y REFUSED = Z	NONE OF THESE, DK, REFUSED → END OF MODULE
510	Who performed the [509] procedure(s)?  CHECK ALL THAT APPLY	TRADITIONAL HEALER/ TRADITIONAL CIRCUMCISER/ TRADITIONAL BIRTH ATTENDANT = A DOCTOR, NURSE, HEALTH OFFICER, MIDWIFE = B FAMILY/FRIEND = C OTHER = X SPECIFY _____ DON'T KNOW = Y REFUSED = Z	Will be repeated for each response to 509
<b>MODULE 6: SEXUAL ACTIVITY</b>			
Interviewer says: "In this part of the interview, I will be asking questions about your sexual relationships and practices. These questions will help us have a better understanding of how they may affect your life and risk for HIV.			
Let me assure you again that your answers are completely confidential and will not be shared with anyone. If there are questions that you do not want to answer, we can go to the next question."			
601	If you wanted a condom, would it be easy for you to get one?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	YES → 603

NO	QUESTIONS	CODING CATEGORIES	SKIPS
602	Why is it not easy for you to get a condom?  SELECT ALL THAT APPLY.	CONDOMS NOT AVAILABLE/ TOO FAR = A NOT CONVENIENT = B COSTS TOO MUCH = C EMBARASSED TO GET CONDOMS = D DO NOT WANT OTHERS TO KNOW = E DO NOT KNOW WHERE TO GET CONDOMS = F OTHER = X SPECIFY: _____ DON'T KNOW = Y REFUSED = Z	
603	How old were you when you had sex for the very first time?	AGE IN YEARS ____ NEVER HAD SEX = 96 DON'T KNOW = -8 REFUSED = -9	
604	People often have sex with different people over their lifetime. In total, with how many different people have you had sex in the last 12 months?  IF NONE CODE '00'.  IF NUMBER OF PARTNERS IS GREATER THAN 100, WRITE '100'.	NUMBER OF SEXUAL PARTNERS IN LAST 12 MONTHS ____  DON'T KNOW = -8 REFUSED = -9	IF 00 PARTNERS IN LAST 12 MONTHS → END OF MODULE
<p>Interviewer says: "Now I would like to ask you some questions about the people you have had sex with in the last 12 months. Let me assure you again that your answers are completely confidential and will not be told to anyone. I will first ask you about the most recent person you had sex with."</p> <p><b>ASK ONLY ABOUT THE LAST 3 PERSONS THE PARTICIPANT HAS HAD SEX WITH.</b></p>			
605	Does the person you had sex with live in this household?	YES = 1 NO = 2	NO → 607
606	Please select the name below from the household membership list. Please identify the person you had sex with.	[LIST OF PERSONS FROM HOUSEHOLD]] NOT LISTED IN HOUSEHOLD = 96	LISTED → 608
607	I would like to ask you for the initials of this person so I can keep track. They do not have to be the actual initials of this person.	INITIALS  _____	
608	What is your relationship with (INITIALS)?	HUSBAND/WIFE = 1 LIVE-IN PARTNER = 2 PARTNER, NOT LIVING WITH RESPONDENT = 3 EX-SPOUSE/EX-PARTNER = 4 FRIEND/ACQUAINTANCE = 5 SEX WORKER = 6 SEX WORKER CLIENT = 7 STRANGER = 8 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	

NO	QUESTIONS	CODING CATEGORIES	SKIPS
609	How old is (INITIALS)? Please give your best guess.	AGE IN YEARS ____ DON'T KNOW = -8 REFUSED = -9	
610	The last time you had sex with (INITIALS) was a condom used?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
611	In the last 12 months, how often did you use condoms with (INITIALS) when having sex? Was it always, most of the time, sometimes, rarely or never?	ALWAYS = 1 MOST OF THE TIME = 2 SOMETIMES = 3 RARELY = 4 NEVER = 5 NO VAGINAL SEX IN THE LAST 12 MONTHS = 3 DON'T KNOW = -8 REFUSED = -9	SKIP IF NEVER HAD SEX. SKIP IF PARTNER IS SAME SEX.
612	In the last 12 months, when you had sex with (INITIALS), did the condom you were using ever break, leak or slip off during sex or while pulling out?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF NEVER USED CONDOMS
613	Did you enter into a sexual relationship with (INITIALS) because (INITIALS) provided you with or you expected that (INITIALS) would provide you gifts, help you to pay for things, or help you in other ways?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 615 SKIP IF SEX WORKER OR CLIENT
614	In the last 12 months, what have you received from (INITIALS)?  READ RESPONSES ALOUD.  SELECT ALL THAT APPLY	DID NOT RECEIVE ANYTHING = A MONEY = B FOOD = C SCHOOL FEES = D EMPLOYMENT = E GIFTS/FAVORS = F TRANSPORT = G SHELTER/RENT = H PROTECTION = I BEER = J WINE = K TEJ = L TELA/ ARAKI = M KHAT = N HASHISH = O GLUE (MASTISH) = P MARIJUANA = Q COCAINE = R HEROIN = S OTHER = X SPECIFY: _____ DON'T KNOW = Y REFUSED = Z	SKIP IF SPOUSE, LIVEIN PARTNER, SEX WORKER OR CLIENT
615	Do you expect to have sex with (INITIALS) again?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	

NO	QUESTIONS	CODING CATEGORIES	SKIPS
616	Have you ever taken an HIV test with (INITIALS)?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	YES, DK, REFUSED → 618
617	What is the main reason you have never tested for HIV with (INITIALS) as a couple?  READ RESPONSES ALOUD.	NOT A PARTNER OR COUPLE = 1 NEVER DISCUSSED = 2 WE ARE NOT AT RISK FOR HIV = 3 PARTNER REFUSED = 4 I REFUSED = 5 WE KNOW OUR STATUS = 6 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	
618	Does (INITIALS) know your HIV status? HIV status could mean you are HIV negative or HIV positive.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
619	What is the HIV status of (INITIALS)?  READ RESPONSES ALOUD	I THINK HE/SHE IS POSITIVE = 1 HE/SHE TOLD ME HE/SHE IS POSITIVE = 2 HE/SHE IS POSITIVE, TESTED TOGETHER = 3 I THINK HE/SHE IS NEGATIVE = 4 HE/SHE TOLD ME HE/SHE IS NEGATIVE = 5 HE/SHE IS NEGATIVE, TESTED TOGETHER = 6 DON'T KNOW STATUS = 7 REFUSED = -9	
620	DOES THE RESPONDENT HAVE ANOTHER PARTNER IN THE LAST 12 MONTHS?  I will now ask you about the person you have had sex with previous to (INITIALS).	YES = 1 NO = 2	YES → 605

**MODULE 7: HIV TESTING**

Interviewer says: "I would now like to ask you some questions about HIV testing."

701	To what extent do you agree with the following statement: All HIV-negative people should test for HIV every year? Do you strongly agree, agree, disagree, or strongly disagree?	STRONGLY AGREE = 1 AGREE = 2 DISAGREE = 3 STRONGLY DISAGREE = 4 DON'T KNOW = -8 REFUSED = -9	
702	Has a health care provider or outreach worker ever talked to you about HIV?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 704

NO	QUESTIONS	CODING CATEGORIES	SKIPS
616	Have you ever taken an HIV test with (INITIALS)?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	YES, DK, REFUSED → 618
617	What is the main reason you have never tested for HIV with (INITIALS) as a couple?  READ RESPONSES ALOUD.	NOT A PARTNER OR COUPLE = 1 NEVER DISCUSSED = 2 WE ARE NOT AT RISK FOR HIV = 3 PARTNER REFUSED = 4 I REFUSED = 5 WE KNOW OUR STATUS = 6 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	
618	Does (INITIALS) know your HIV status? HIV status could mean you are HIV negative or HIV positive.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
619	What is the HIV status of (INITIALS)?  READ RESPONSES ALOUD	I THINK HE/SHE IS POSITIVE = 1 HE/SHE TOLD ME HE/SHE IS POSITIVE = 2 HE/SHE IS POSITIVE, TESTED TOGETHER = 3 I THINK HE/SHE IS NEGATIVE = 4 HE/SHE TOLD ME HE/SHE IS NEGATIVE = 5 HE/SHE IS NEGATIVE, TESTED TOGETHER = 6 DON'T KNOW STATUS = 7 REFUSED = -9	
620	DOES THE RESPONDENT HAVE ANOTHER PARTNER IN THE LAST 12 MONTHS?  I will now ask you about the person you have had sex with previous to (INITIALS).	YES = 1 NO = 2	YES → 605
<b>MODULE 7: HIV TESTING</b>			
<b>Interviewer says: "I would now like to ask you some questions about HIV testing."</b>			
701	To what extent do you agree with the following statement: All HIV-negative people should test for HIV every year? Do you strongly agree, agree, disagree, or strongly disagree?	STRONGLY AGREE = 1 AGREE = 2 DISAGREE = 3 STRONGLY DISAGREE = 4 DON'T KNOW = -8 REFUSED = -9	
702	Has a health care provider or outreach worker ever talked to you about HIV?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 704

NO	QUESTIONS	CODING CATEGORIES	SKIPS
616	Have you ever taken an HIV test with (INITIALS)?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	YES, DK, REFUSED → 618
617	What is the main reason you have never tested for HIV with (INITIALS) as a couple?  READ RESPONSES ALOUD.	NOT A PARTNER OR COUPLE = 1 NEVER DISCUSSED = 2 WE ARE NOT AT RISK FOR HIV = 3 PARTNER REFUSED = 4 I REFUSED = 5 WE KNOW OUR STATUS = 6 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	
618	Does (INITIALS) know your HIV status? HIV status could mean you are HIV negative or HIV positive.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
619	What is the HIV status of (INITIALS)?  READ RESPONSES ALOUD	I THINK HE/SHE IS POSITIVE = 1 HE/SHE TOLD ME HE/SHE IS POSITIVE = 2 HE/SHE IS POSITIVE, TESTED TOGETHER = 3 I THINK HE/SHE IS NEGATIVE = 4 HE/SHE TOLD ME HE/SHE IS NEGATIVE = 5 HE/SHE IS NEGATIVE, TESTED TOGETHER = 6 DON'T KNOW STATUS = 7 REFUSED = -9	
620	DOES THE RESPONDENT HAVE ANOTHER PARTNER IN THE LAST 12 MONTHS?  I will now ask you about the person you have had sex with previous to (INITIALS).	YES = 1 NO = 2	YES → 605

## MODULE 7: HIV TESTING

Interviewer says: "I would now like to ask you some questions about HIV testing."

701	To what extent do you agree with the following statement: All HIV-negative people should test for HIV every year? Do you strongly agree, agree, disagree, or strongly disagree?	STRONGLY AGREE = 1 AGREE = 2 DISAGREE = 3 STRONGLY DISAGREE = 4 DON'T KNOW = -8 REFUSED = -9	
702	Has a health care provider or outreach worker ever talked to you about HIV?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 704

NO	QUESTIONS	CODING CATEGORIES	SKIPS
616	Have you ever taken an HIV test with (INITIALS)?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	YES, DK, REFUSED → 618
617	What is the main reason you have never tested for HIV with (INITIALS) as a couple?  READ RESPONSES ALOUD.	NOT A PARTNER OR COUPLE = 1 NEVER DISCUSSED = 2 WE ARE NOT AT RISK FOR HIV = 3 PARTNER REFUSED = 4 I REFUSED = 5 WE KNOW OUR STATUS = 6 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	
618	Does (INITIALS) know your HIV status? HIV status could mean you are HIV negative or HIV positive.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
619	What is the HIV status of (INITIALS)?  READ RESPONSES ALOUD	I THINK HE/SHE IS POSITIVE = 1 HE/SHE TOLD ME HE/SHE IS POSITIVE = 2 HE/SHE IS POSITIVE, TESTED TOGETHER = 3 I THINK HE/SHE IS NEGATIVE = 4 HE/SHE TOLD ME HE/SHE IS NEGATIVE = 5 HE/SHE IS NEGATIVE, TESTED TOGETHER = 6 DON'T KNOW STATUS = 7 REFUSED = -9	
620	DOES THE RESPONDENT HAVE ANOTHER PARTNER IN THE LAST 12 MONTHS?  I will now ask you about the person you have had sex with previous to (INITIALS).	YES = 1 NO = 2	YES → 605

**MODULE 7: HIV TESTING**

Interviewer says: "I would now like to ask you some questions about HIV testing."

701	To what extent do you agree with the following statement: All HIV-negative people should test for HIV every year? Do you strongly agree, agree, disagree, or strongly disagree?	STRONGLY AGREE = 1 AGREE = 2 DISAGREE = 3 STRONGLY DISAGREE = 4 DON'T KNOW = -8 REFUSED = -9	
702	Has a health care provider or outreach worker ever talked to you about HIV?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 704

NO	QUESTIONS	CODING CATEGORIES	SKIPS
703	During any of your visits to the health facility in the last 12 months, did a doctor, clinical officer or nurse offer you an HIV test?	YES = 1 NO = 2 HAVE NOT VISITED HEALTH FACILITY IN LAST 12 MONTHS = 3 DON'T KNOW = -8 REFUSED = -9	
704	Have you ever tested for HIV?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO → DK, REFUSED → END OF MODULE  CONSTRAINT IF REPORTED TESTING
705	In your lifetime, how many times have you been tested for HIV?	NUMBER OF TIMES TESTED FOR HIV ____  DON'T KNOW = -8 REFUSED = -9	CONSTRAINT SHOULD BE >=1  ALL → 707
706	Why have you never been tested for HIV?  SELECT ALL THAT APPLY.	DON'T KNOW WHERE TO TEST = A TEST COSTS TOO MUCH = B TRANSPORT COSTS TOO MUCH = C TOO FAR AWAY = D AFRAID OTHERS WILL KNOW ABOUT TEST RESULTS = E DON'T NEED TEST/LOW RISK = F DID NOT RECEIVE PERMISSION FROM SPOUSE/FAMILY = G AFRAID SPOUSE/PARTNER/FAMILY WILL KNOW RESULTS = H DON'T WANT TO KNOW I HAVE HIV = I CANNOT GET TREATMENT FOR HIV = J TEST KITS NOT AVAILABLE = K RELIGIOUS REASONS = L OTHER = X SPECIFY: _____ DON'T KNOW = Y REFUSED = Z	ALL → END OF MODULE
707	What month and year was your last HIV test?	MONTHS ____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9  YEAR ____ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	
708	Where was the last test done?	VCT FACILITY = 1 MOBILE VCT = 2 AT HOME = 3 HEALTH CLINIC / FACILITY = 4 HOSPITAL OUTPATIENT CLINIC = 5 TB CLINIC = 6 STI CLINIC = 7 HOSPITAL IN PATIENT WARDS = 8 BLOOD DONATING CENTER = 9 ANC CLINIC = 10 OUTREACH = 11 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	AT HOME, OUTREACH, OTHER, DK, REFUSED → 711

NO	QUESTIONS	CODING CATEGORIES	SKIPS
709	Was the facility where you last tested public, private, faith based, or NGO run?	PUBLIC HEALTH SECTOR = 1 NGO HEALTH FACILITY = 2 PRIVATE MEDICAL SECTOR = 3 FAITH BASED CLINIC = 4 DON'T KNOW = -8 REFUSED = -9	
710	The last time you tested for HIV, what was the main reason you tested for HIV?	HEALTH CARE OR OUTREACH OFFERED TEST = 1 I JUST WANTED TO KNOW = 2 FELT AT RISK OR SICK = 3 GOT A NEW PARTNER = 4 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSE TO ANSWER = -9	
711	What was the result of that last HIV test?	POSITIVE = 1 NEGATIVE = 2 UNCERTAIN/ INDETERMINATE = 3 DID NOT RECEIVE THE RESULT = 4 DON'T KNOW = -8 REFUSED = -9	NEG, UNCERTAIN/IN D, NO RESULT, DK, REF → 724
712	What was the month and year of your first HIV positive test result? Please give your best guess.  This will be the very first HIV positive test result that you have received.  PROBE TO VERIFY DATE.	MONTH _____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9  YEAR _____ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	
713	Of the following people, who have you told that you are HIV positive?  CHECK ALL THAT APPLY.	NO ONE = A SPOUSE/SEX PARTNER = B DOCTOR = C FRIEND = D FAMILY MEMBER = E OTHER = X SPECIFY: _____ DON'T KNOW = Y REFUSED = Z	SKIP TO NEXT QUESTION IF NO ONE, DK OR REFUSED
Interviewer says: "Now I would like to ask you questions about your experiences with health care providers."			SKIP TO END OF MODULE IF NOT HIV POSITIVE.
714	In the last 12 months, when you sought health care in a facility where your HIV status is not known, did you feel you needed to hide your HIV status?	YES = 1 NO, NO NEED TO HIDE = 2 NO, DID NOT ATTEND HEALTH FACILITY IN LAST 12 MONTHS = 3 DON'T KNOW = -8 REFUSED = -9	
715	In the last 12 months, have you been denied health services including dental care, because of your HIV status?	YES = 1 NO = 2 NO ONE KNOWS MY STATUS = 3 DON'T KNOW = -8 REFUSED = -9	

NO	QUESTIONS	CODING CATEGORIES	SKIPS
716	In the last 12 months, have health care providers talked badly about you because of your HIV status?	YES = 1 NO = 2 NO ONE KNOWS MY STATUS = 3 DON'T KNOW = -8 REFUSED = -9	
Interviewer says: "I would now like to ask you some questions about discrimination you may have experienced because you are HIV positive."			SKIP TO NEXT MODULE IF HIV NEGATIVE  SKIP TO NEXT MODULE IF NO ONE KNOWS STATUS
717	In the last 12 months, have you been verbally insulted, harassed and/or threatened because of your HIV status?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
718	In the last 12 months, have you been physically assaulted because of your HIV status?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
719	In the last 12 months, have you lost your job or another source of income because of your HIV status?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
720	In the last 12 months, have you been dismissed, suspended, or prevented from attending an educational institution because of your HIV status?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
721	In the last 12 months, has your child/children been dismissed, suspended or prevented from attending an educational institution because of your or his/her HIV status?	YES = 1 NO, NOT DISMISSED, SUSPENDED OR PREVENTED = 2 NO, DO NOT HAVE CHILDREN = 3 DON'T KNOW = -8 REFUSED = -9	
722	In the last 12 months, have you been forced to change your place of residence or been unable to rent accommodation because of your HIV status?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
723	Have you tried to get legal redress for any abuse of your rights as a person living with HIV?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	ALL → NEXT MODULE
724	How likely do you think it is that you will get HIV?	VERY LIKELY = 1 SOMEWHAT LIKELY = 2 NOT LIKELY = 3 DON'T KNOW = 8 REFUSED = -9	
<b>MODULE 8: ATTITUDES TOWARD HIV DISCLOSURE</b>			
Interviewer says: "Now I would like to ask you how much you agree or disagree with the following questions."			
801	In general, disclosing HIV status to other people in my community can be helpful to me.  Do you strongly agree, agree, disagree or strongly disagree?	STRONGLY AGREE = 1 AGREE = 2 DISAGREE = 3 STRONGLY DISAGREE = 4 DON'T KNOW = -8 REFUSED = -9	

NO	QUESTIONS	CODING CATEGORIES	SKIPS
802	In general, disclosing my HIV status in my community is more likely to lead to negative outcomes.	STRONGLY AGREE = 1 AGREE = 2 DISAGREE = 3 STRONGLY DISAGREE = 4 DON'T KNOW = -8 REFUSED = -9	
803	Disclosing HIV status to others can be helpful to me for taking my ARVs regularly.	STRONGLY AGREE = 1 AGREE = 2 DISAGREE = 3 STRONGLY DISAGREE = 4 DON'T KNOW = -8 REFUSED = -9	
804	I find it easy to disclose my HIV status to other people.	STRONGLY AGREE = 1 AGREE = 2 DISAGREE = 3 STRONGLY DISAGREE = 4 DON'T KNOW = -8 REFUSED = -9	
805	I am interested in disclosing my HIV status to more people than I already have.	STRONGLY AGREE = 1 AGREE = 2 DISAGREE = 3 STRONGLY DISAGREE = 4 DON'T KNOW = -8 REFUSED = -9	

#### MODULE 9: HIV STATUS, CARE AND TREATMENT

Interviewer says: "Now I'm going to ask you more about your experience with HIV support, care and treatment."		SKIP TO NEXT MODULE IF NOT HIV POSITIVE	
901	After learning you had HIV, have you ever received HIV medical care from a doctor, clinical officer or nurse?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	YES → 903 DK, REFUSED → END OF MODULE
902	What is the main reason why you have never received HIV medical care from a doctor, clinical officer, or nurse?	FACILITY IS TOO FAR AWAY = 1 I DON'T KNOW WHERE TO GET HIV MEDICAL CARE = 2 COST OF CARE = 3 COST OF TRANSPORT = 4 I DO NOT NEED IT/I FEEL HEALTHY/NOT SICK = 5 I FEAR PEOPLE WILL KNOW THAT I HAVE HIV IF I GO TO A CLINIC = 6 RELIGIOUS REASONS = 7 I'M TAKING TRADITIONAL MEDICINE = 8 DO NOT TRUST THE STAFF/ QUALITY OF CARE = 9 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	SKIP TO 908
903	What month and year did you first see a doctor, clinical officer or nurse for HIV medical care?	MONTH ____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9	
	PROBE TO VERIFY DATE.	YEAR ____ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	

NO	QUESTIONS	CODING CATEGORIES	SKIPS
904	What month and year did you last see a doctor, clinical officer or nurse for HIV medical care?	MONTH ____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9  YEAR ____ DON'T KNOW YEAR = -8 REFUSED = -9	IF <7 MONTHS, DK, REFUSED → 908
905	What is the main reason for not seeing a doctor, clinical officer or nurse for HIV medical care for more than 6 months?	THE FACILITY IS TOO FAR AWAY = 1 I DON'T KNOW WHERE TO GET HIV MEDICAL CARE = 2 COST OF CARE = 3 COST OF TRANSPORT = 4 I DO NOT NEED IT/I FEEL HEALTHY/NOT SICK = 5 I FEAR PEOPLE WILL KNOW THAT I HAVE HIV IF I GO TO A CLINIC = 6 I'M TAKING TRADITIONAL MEDICINE = 7 RELIGIOUS REASONS = 8 NO APPOINTMENT SCHEDULED/ DID NOT MISS MOST RECENT APPOINTMENT = 9 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	
906	At your last HIV care visit, approximately how long did it take you to travel from your home (or workplace) to the HIV clinic one-way?	LESS THAN ONE HOUR = 1 ONE TO TWO HOURS = 2 MORE THAN TWO HOURS = 3 DON'T KNOW = -8 REFUSED = -9	
907	At your last HIV care visit, approximately how much did it cost to travel from your home (or workplace) one-way?	COST IN BIRR ____ DON'T KNOW = -8 REFUSED = -9	
908	Have you ever had a CD4 count test?  The CD4 count tells you how sick you are with HIV and if you need to take ARVs or other HIV medications.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 910
909	What month and year were you last tested for your CD4 count?	MONTH ____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9  YEAR ____ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	
910	Did you ever have a viral load test?  This is a test that measures how much HIV is in your blood.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 913

NO	QUESTIONS	CODING CATEGORIES	SKIPS
911	When did you last have a viral load test?	MONTH ____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9  YEAR ____ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	
912	Were you told the result of your last viral load test?	YES= 1 NO= 2 DON'T KNOW = -8 REFUSED = -9	
913	Have you ever taken ARVs, that is, antiretroviral medications to treat HIV infection?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	YES → 915  DK, REFUSED → 919
914	What is the main reason you have never taken ARVs?	NOT ELIGIBLE FOR TREATMENT=1 HEALTH CARE PROVIDER DID NOT PRESCRIBE = 2 HIV MEDICINES NOT AVAILABLE = 3 I FEEL HEALTHY/NOT SICK = 3 COST OF MEDICATIONS = 4 COST OF TRANSPORT = 5 RELIGIOUS REASONS = 6 TAKING TRADITIONAL MEDICATIONS = 7 NOT ATTENDING HIV CLINIC = 8 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	ALL → 919
915	What month and year did you first start taking ARVs?  PROBE TO VERIFY DATE.	MONTH ____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9  YEAR ____ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	
916	Are you currently taking ARVs, that is, antiretroviral medications?  By currently, I mean that you may have missed some doses but you are still taking ARVs.	YES = 1 NO=2 DON'T KNOW = -8 REFUSED = -9	YES → 918 DK, REFUSED → 919

NO	QUESTIONS	CODING CATEGORIES	SKIPS
917	Can you tell me the main reason why you are not currently taking ARVs?	I HAVE TROUBLE TAKING A TABLET EVERYDAY = 1 I HAD SIDE EFFECTS = 2 FACILITY TOO FAR AWAY FOR ME TO GET MEDICINE REGULARLY = 3 COST OF MEDICATIONS = 4 COST OF TRANSPORT = 5 I FEEL HEALTHY/NOT SICK = 6 FACILITY WAS OUT OF STOCK = 7 RELIGIOUS REASONS = 8 TAKING TRADITIONAL MEDICATIONS = 9 OTHER=96 SPECIFY: _____ DON' T KNOW = -8 REFUSED = -9	ALL → 919
918	People sometimes forget to take all of their ARVs every day. In the last 30 days, how many days have you missed taking any of your ARV pills?	NUMBER OF DAYS _____ DON'T KNOW = -8 REFUSED = -9	
	CODE '00' IF NONE.		
919	<p>Are you currently taking Bactrim or Cotrimoxazole?</p> <p>Bactrim or Cotrimoxazole is a medicine recommended for people with HIV, even if they have not started treatment for HIV. It helps prevent certain infections but it is not treatment for HIV.</p> <p>By currently, I mean that you may have missed some doses but you are still taking Cotrimoxazole.</p>	YES = 1 NO=2 DON'T KNOW = -8 REFUSED = -9	YES, DK, REFUSED → 921
920	Can you tell me the main reason why you are not currently taking Cotrimoxazole?	WAS NOT PRESCRIBED= 1 I HAVE TROUBLE TAKING A TABLET EVERYDAY = 2 I HAD SIDE EFFECTS/RASH = 3 FACILITY TOO FAR AWAY FOR ME TO GET COTRIMOXAZOLE REGULARLY = 4 DO NOT NEED IT/NOT SICK = 5 PHARMACY/FACILITY WAS OUT OF STOCK = 6 COST OF MEDICATIONS = 7 COST OF TRANSPORT = 8 DOCTOR SAID NO LONGER NEEDED = 9 OTHER=96 SPECIFY: _____ DON' T KNOW = -8 REFUSED = -9	

NO	QUESTIONS	CODING CATEGORIES	SKIPS
921	Have you ever taken a medicine called Isoniazid (INH) or IPT to prevent developing TB?  Isoniazid is medication that prevents TB. It is given to people with HIV or people who are in contact with someone with TB.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 924
922	Are you currently taking INH?  By currently, I mean that you may have missed some doses but you are still taking INH.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 924
923	How many months have you taken INH?	NUMBER OF MONTHS ____  DON'T KNOW = -8 REFUSED = -9	SKIP IF NOT HIV POSITIVE
924	While receiving HIV care, has a health care provider or outreach worker spoken to you about family planning methods or contraceptives?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF 901 = NO, DK, REFUSED
925	In the last 12 months, how often did a doctor, clinical officer or nurse weigh you?	EVERY VISIT = 1 SOME VISITS = 2 NEVER = 3 DON'T KNOW = -8 REFUSED = -9	
926	In the last 12 months, were you told by your doctor, clinical officer or nurse that you were underweight or had a low weight?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 928
927	Were you given a nutritional supplement or referred for a nutritional consult or both?	NO, NEVER GIVEN SUPPLEMENT/ REFERRED = 1 YES, GIVEN SUPPLEMENT = 2 YES, REFERRED = 3 BOTH GIVEN SUPPLEMENT AND REFERRED = 4 DON'T KNOW = -8 REFUSED = -9	
928	Have you ever attended a support group for people living with HIV?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → NEXT MODULE
929	In the last 12 months, how many times did you attend a support group for people living with HIV?  CODE '00' IF NONE.	NUMBER OF TIMES ____ DON'T KNOW = -8 REFUSED = -9	

NO	QUESTIONS	CODING CATEGORIES	SKIPS
930	Which of the following do you receive from the support group related to your HIV infection?  READ EACH RESPONSE.  SELECT ALL THAT APPLY.	NOTHING = A COUNSELING/HEALTHY LIVING MESSAGES = B REMINDED OF IMPORTANCE OF TAKING ARV REGULARLY = C REMINDED TO KEEP HIV APPOINTMENTS = D REFILLS OR PICKING UP ARV MEDICATIONS = E PSYCHOSOCIAL SUPPORT = F LIVELIHOOD/MATERIAL SUPPORT = G OTHER = X SPECIFY: _____ DON'T KNOW = Y REFUSED = Z	
<b>MODULE 10: TUBERCULOSIS AND OTHER HEALTH ISSUES</b>			
Interviewer says: "Now we will ask you about tuberculosis or TB."			
1001	Have you ever visited a clinic for TB diagnosis or treatment?	YES = 1 NO=2 DON'T KNOW = -8 REFUSED = -9	
1002	Were you tested for HIV at the TB clinic?	YES = 1 NO, WAS NOT TESTED FOR HIV = 2 NO, ALREADY HIV POSITIVE = 3 DON'T KNOW = -8 REFUSED = -9	
1003	Have you ever been told by a doctor, clinical officer or nurse that you had TB?	YES = 1 NO=2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 1009
1004	Were you ever treated for TB?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 1009
1005	What month and year did a health care provider start you on treatment for TB?  RECORD THE MOST RECENT TIME IF DIAGNOSED WITH TB MORE THAN ONCE.	MONTH ____ DON'T KNOW MONTH = -8 REFUSED MONTH = -9  YEAR ____ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	
1006	Are you currently on treatment for TB?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	YES, DK, REFUSED → 1008
1007	The last time you were treated for TB, did you complete at least 6 months of treatment?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	

NO	QUESTIONS	CODING CATEGORIES	SKIPS
1008	Where do you or did you receive treatment/medications for TB?  SELECT ALL THAT APPLY	TB CLINIC/DOT CLINIC = A HIV CLINIC = B GENERAL CLINIC = C DON'T KNOW = Y REFUSED = Z	
<p>Interviewer says: "Now I'm going to ask you about tests a health care provider can do to check for cervical cancer. The cervix connects the uterus to the vagina. The tests a health care provider can do to check for cervical cancer are called a Pap smear, HPV test and VIA test. For a Pap smear and HPV test, a health care provider puts a small stick inside the vagina to wipe the cervix and sends the sample to the laboratory. For a VIA test, a healthcare worker puts vinegar on the cervix and looks to see if the cervix changes color."</p>			SKIP SECTION IF MALE
1009	Have you ever been tested for cervical cancer?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED →  ELECTRONIC AID IF DON'T KNOW.
1010	What month and year was your last test for cervical cancer?	MONTH ____ DON'T KNOW MONTH = -8 REFUSED = -9  YEAR ____ DON'T KNOW YEAR = -8 REFUSED YEAR = -9	
1011	What was the result of your last test for cervical cancer?	NORMAL/NEGATIVE = 1 ABNORMAL/POSITIVE = 2 SUSPECT CANCER = 3 UNCLEAR/INCONCLUSIVE = 4 DID NOT RECEIVE RESULTS = 5 DON'T KNOW = -8 REFUSED = -9	NORMAL, UNCLEAR, DID NOT RECEIVE, DK, REFUSED → 1014
1012	Did you receive treatment after your last test for cervical cancer? Did you receive treatment on the same day or on a different day?	YES, I WAS TREATED ON THE SAME DAY = 1 YES, I RECEIVED TREATMENT ON A DIFFERENT DAY = 2 NO = 3 REFUSED = -8 DON'T KNOW = -9	
1013	Did you have any follow up visits because of your test results?	YES = 1 NO = 2 REFUSED = -8 DON'T KNOW = -9	
Interviewer says: "Now I would like to ask you questions about sexual health."			SKIP TO NEXT MODULE IF NEVER HAD SEX
1014	During the last 12 months, have you had an abnormal discharge from your vagina or experienced pelvic pain? This may include an unusual smell, color, or texture.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF MALE
1015	During the last 12 months, have you had pelvic pain including pelvic pain during sex?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF MALE

NO	QUESTIONS	CODING CATEGORIES	SKIPS
1016	During the last 12 months, have you had an ulcer or sore on or near your vagina?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF MALE
1017	During the last 12 months, have you had an abnormal discharge from your penis?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF FEMALE
1018	During the last 12 months, have you had an ulcer or sore on or near your penis?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF FEMALE
1019	During the last 12 months, have you had pain on urination?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF FEMALE
1020	Did you see a doctor, clinical officer or nurse because of these problems?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF NO TO 1014-1019
1021	In the last 12 months, did a doctor, clinical officer or nurse tell you that you had a sexually transmitted disease, other than HIV?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
1022	Did you get treatment for these problems?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → ONLY YES TO 1014-1019; YES TO 1021
1023	Who prescribed the treatment?? SELECT ALL THAT APPLY.	DOCTOR, CLINICAL OFFICER, NURSE = A PHARMACIST = B SELF-PRESCRIBED = C OTHER = X SPECIFY: _____ DON'T KNOW = Y REFUSED = Z	ONLY YES TO 1014-1019; YES TO 1021

#### MODULE 11: GENDER NORMS

Interviewer says: "Now I would like to ask you questions on attitudes and decision-making in your home."

1101	Who usually makes decisions about health care for yourself: you, your (spouse/partner), you and your (spouse/partner) together, or someone else?	I DO = 1 SPOUSE/PARTNER = 2 WE BOTH DO = 3 SOMEONE ELSE = 4 DON'T KNOW = -8 REFUSED = -9	SKIP IF NOT MARRIED/LIVING TOGETHER
1102	Who generally decides about how the money you receive is spent: you, your (spouse/partner), you and your (spouse/partner) together, or someone else?	I DO = 1 SPOUSE/PARTNER = 2 WE BOTH DO = 3 SOMEONE ELSE = 4 DON'T KNOW = -8 REFUSED = -9	SKIP IF NOT MARRIED/LIVING TOGETHER

#### MODULE 12: ALCOHOL USE/NON-PRESCRIPTION DRUG USE

NO	QUESTIONS	CODING CATEGORIES	SKIPS
<b>Interviewer says: "The next few questions will be on your use of alcohol and non-prescription drugs. Remember, all the answers you provide will be kept confidential."</b>			
1201	Have you ever had alcohol, for example beer, tej, wine, or tela araki?  SHOW GRAPHIC OF COMMON ALCOHOLIC BEVERAGES.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 1203
1202	During the past 1 month, on how many days did you have at least one drink containing alcohol?	NUMBER OF DAYS ____ DON'T KNOW = -8 REFUSED = -9	MAX = 31
1203	Have you ever tried drugs such as khat, hashish, glue (mastish), marijuana, cocaine, heroin, or others?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
1204	Do you chew khat?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 1207
1205	How long have you been chewing Khat?	< 1 YEAR = 1 1-5 YEARS = 2 6-10 YEARS = 3 >10 YEARS = 4 DON'T KNOW = -8 REFUSED = -9	
1206	How many days in the week do you normally chew khat?	5-7 DAYS PER WEEK = 1 3-4 DAYS PER WEEK = 2 1-2 DAYS PER WEEK = 3 OCCASSIONALLY = 4 DON'T KNOW = -8 REFUSED = -9	
1207	Some people inject drugs with a needle and syringe for pleasure. Have you ever injected drugs for pleasure?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → END OF MODULE
1208	Have you injected drugs with a needle and syringe in the last 30 days?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → END OF MODULE
1209	When you have injected drugs during the last 30 days, have you shared the syringe or needle with other people?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	

**MODULE 13: VIOLENCE**

Interviewer says: "You have been selected to be asked questions on other important aspects of a person's life. I know that some of these questions are very personal. However, your answers are important for helping to understand the condition of men and women in Ethiopia. Let me assure you that your answers are completely confidential and will not be told to anyone and no one in your household will know that you were asked these questions. You can stop at any time or refuse to answer any question."

**SELECT ONLY 1 WOMAN PER HOUSEHOLD.**

NO	QUESTIONS	CODING CATEGORIES	SKIPS
1301	<p>How many times in your life has someone pressured you to have sex through harassment, threats and tricks and did succeed?</p> <p>ENTER '0' IF NONE.</p> <p>Being pressured can include being worn down by someone who repeatedly asks for sex, feeling pressured by being lied to, being told promises that were untrue, having someone threaten to end a relationship or spread rumors or sexual pressure due to someone using their influence or authority.</p>	<p>NUMBER OF TIMES ____</p> <p>DON'T KNOW = -8</p> <p>REFUSED = -9</p>	NONE, DK, REFUSED → 1305
1302	<p>How old were you the first time someone pressured you to have sex and did succeed?</p>	<p>AGE IN YEARS ____</p> <p>DON'T KNOW = -8</p> <p>REFUSED = -9</p>	
1303	<p>What was this person's relationship to you? If it was more than one person, what was your relationship with the person you knew the best?</p>	<p>BOYFRIEND/GIRLFRIEND/ LIVE-IN PARTNER/SPOUSE = 1</p> <p>EXBOYFRIEND/GIRLFRIEND/ PARTNER/SPOUSE = 2</p> <p>RELATIVE/FAMILY MEMBER = 3</p> <p>CLASSMATE/SCHOOLMATE = 4</p> <p>TEACHER = 5</p> <p>POLICE/SECURITY OFFICER/MILITARY = 6</p> <p>EMPLOYER = 7</p> <p>NEIGHBOR = 8</p> <p>COMMUNITY/RELIGIOUS LEADER = 9</p> <p>FRIEND = 10</p> <p>STRANGER = 11</p> <p>OTHER = 96</p> <p>SPECIFY: _____</p> <p>DON'T KNOW = -8</p> <p>REFUSED = -9</p>	SKIP IF ONLY HAPPENED ONCE
1304	<p>In the last 12 months, did someone pressure you to have sex and did succeed?</p>	<p>YES = 1</p> <p>NO = 2</p> <p>DON'T KNOW = -8</p> <p>REFUSED = -9</p>	
1305	<p>How many times in your life have you been physically forced to have sex?</p> <p>CODE '00' IF NONE.</p>	<p>NUMBER OF TIMES ____</p> <p>DON'T KNOW = -8</p> <p>REFUSED = -9</p>	NONE, DK, REFUSED → END OF MODULE
1306	<p>How old were you the first time someone physically forced you to have sex?</p>	<p>AGE IN YEARS ____</p> <p>DON'T KNOW = -8</p> <p>REFUSED = -9</p>	
1307	<p>In the last 12 months, did someone physically force you to have sex?</p>	<p>YES = 1</p> <p>NO = 2</p> <p>DON'T KNOW = -8</p> <p>REFUSED = -9</p>	NO, DK, REFUSED → 1309

NO	QUESTIONS	CODING CATEGORIES	SKIPS
1308	In the last 12 months, did a partner physically force you to have sex?  By partner, I mean a live-in partner whether or not you were married at the time.	YES = 1 NO, DID NOT FORCE = 2 NO, DID NOT HAVE A LIVE-IN PARTNER IN THE LAST 12 MONTHS = 3 DON'T KNOW = -8 REFUSED = -9	
1309	After any of these unwanted sexual experiences, did you try to seek professional help or services from any of the following?  SELECT ALL THAT APPLY.	I DID NOT TRY TO SEEK HELP = A HEALTHCARE PROFESSIONAL = B POLICE OR OTHER SECURITY PERSONNEL = C SOCIAL WORKER, COUNSELOR OR NON-GOVERNMENTAL ORGANIZATION = D RELIGIOUS LEADER = E OTHER = X SPECIFY: _____ DON'T KNOW = Y REFUSED = Z	DID NOT TRY TO SEEK HELP → 1310 ELSE → 1311  ALL EXCEPT DID NOT TRY TO SEEK HELP → END OF MODULE  SKIP IF NEVER EXPERIENCED SEXUAL VIOLENCE
1310	What was the main reason that you did not try to seek professional help or services?	DID NOT KNOW SERVICES WERE AVAILABLE = 1 SERVICES NOT AVAILABLE = 2 AFRAID OF GETTING IN TROUBLE = 3 ASHAMED FOR SELF/FAMILY = 4 COULD NOT AFFORD SERVICES = 5 DID NOT THINK IT WAS A PROBLEM = 6 FELT IT WAS MY FAULT = 7 AFRAID OF BEING ABANDONED = 8 DID NOT NEED/WANT SERVICES = 9 AFRAID OF MAKING SITUATION WORSE = 10 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	SKIP IF NEVER EXPERIENCED SEXUAL VIOLENCE
1311	Interviewer says: "Thank you for sharing your personal experiences with me. I know it may have been difficult for you to talk about your experiences with me. If you would like to talk further about these experiences, I can refer you to a place that can provide you with help."  PROVIDE PARTICIPANT WITH LIST OF ORGANIZATIONS.		SKIP IF NEVER EXPERIENCED SEXUAL OR PHYSICAL VIOLENCE.
	Interviewer says: "You mentioned earlier that you have sold sex for money. Thank you for sharing your personal experiences with me. If you want to talk further about these experiences, I can refer you to a place that can provide you with help."  FILL OUT REFERRAL FORM FOR CHILDREN IDENTIFIED AS TRAFFICKED MINORS.  FILL OUT SUMMARY OF REFERRED TRAFFICKED MINORS. PROVIDE PARTICIPANT WITH LIST OF ORGANIZATIONS, IF NOT ALREADY GIVEN.		SKIP IF >18 YEARS OLD  SKIP IF NEVER SOLD SEX

## APPENDIX G YOUNG ADOLESCENT QUESTIONNAIRE

THIS QUESTIONNAIRE IS ADMINISTERED TO ELIGIBLE YOUNG ADOLESCENTS AGED BETWEEN 12-14 YEARS AFTER INFORMED PARENTAL/GUARDIAN CONSENT AND MINOR ASSENT.

NO.	QUESTIONS	CODING CATEGORIES	SKIPS
<b>MODULE 1: SOCIO-DEMOGRAPHIC CHARACTERISTICS</b>			
101	IS THE RESPONDENT MALE OR FEMALE?	MALE = 1 FEMALE = 2	
102	How old were you at your last birthday?	AGE IN COMPLETED YEARS DON'T KNOW AGE = -8 REFUSED = -9	
103	Are you enrolled in school?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 107
104	During the last school week, did you miss any school days for any reason?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 106
105	Why did you miss school? Check all that apply.	I HAVE BEEN SICK = 1 I DON'T FEEL SAFE TRAVELING TO SCHOOL = 2 I DON'T FEEL SAFE WHILE IN SCHOOL = 3 I DON'T LIKE SCHOOL = 4 I HAVE TO LOOK AFTER MY FAMILY = 5 THERE'S NOT ENOUGH MONEY TO SEND ME TO SCHOOL = 6 SCHOOL IS TOO FAR AWAY = 7 I HAVE TO WORK = 8 I HAVE A CHILD OR I AM PREGNANT (GIRLS ONLY) = 9 I MISSED TOO MUCH SCHOOL BECAUSE OF MY PERIOD (MENSTRUATION) (GIRLS ONLY) = 10 MY FAMILY WANTS ME TO STAY HOME = 11 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	
106	What grade are you in now?	GRADE ____ DON'T KNOW = -8 REFUSED = -9	For children who are in school and answer this question → 202

NO.	QUESTIONS	CODING CATEGORIES	SKIPS
107	Why are you not enrolled in school?	I HAVE BEEN SICK = 1 I DON'T FEEL SAFE TRAVELING TO SCHOOL = 2 I DON'T FEEL SAFE WHILE IN SCHOOL = 3 I DON'T LIKE SCHOOL = 4 I HAVE TO LOOK AFTER MY FAMILY = 5 THERE'S NOT ENOUGH MONEY TO SEND ME TO SCHOOL = 6 SCHOOL IS TOO FAR AWAY = 7 I HAVE TO WORK = 8 I HAVE A CHILD OR I AM PREGNANT (GIRLS ONLY) = 9 I MISSED TOO MUCH SCHOOL BECAUSE OF MY PERIOD (MENSTRUATION) (GIRLS ONLY) = 10 I AM MARRIED = 11 FAMILY WANTS ME TO STAY HOME = 12 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	Ask this question only for those who answered No or Don't Know or Refused to 103.
108	Have you ever attended school?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	Ask this question only for those who answered No or Don't Know or Refused to 103.  If a child answers NO, DK, or REFUSED → 201
109	When was the last time you regularly attended school? Would you say it was less than a year ago or more than a year ago?	LESS THAN 1 YEAR = 1 1 YEAR OR LONGER = 2 DON'T KNOW = -8 REFUSED = -9	Ask this question only for those who answered Yes to 108
110	What is the highest grade that you have completed?	GRADE ____ DON'T KNOW = -8 REFUSED = -9	Ask this question only for those who are not enrolled in school now. (Those who answered Yes to 108)
<b>MODULE 2: HIV PREVENTION INTERVENTIONS</b>			
201	Have you ever heard of HIV?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, or REFUSED → 205

NO.	QUESTIONS	CODING CATEGORIES	SKIPS
202	From where have you heard about HIV?  PROBE: Anywhere else?  RECORD ALL MENTIONED	SCHOOLS/TEACHERS = A PARENTS/GUARDIAN/FAMILY = B FRIENDS = C RELIGIOUS LEADERS = D INTERNET = E MOBILE PHONE = F HEALTH PROVIDERS/DOCTORS/ NURSES/ HEALTH OFFICERS = G TELEVISION/FILM = H RADIO = I COMMUNITY HEALTH WORKERS = J BILLBOARDS/POSTERS = K OTHER = X SPECIFY: _____ DON'T KNOW = Y REFUSED = Z	
203	Have you ever discussed HIV with your parents or guardian?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
204	Do you know what a condom is?	YES = 1 NO = 2 REFUSED = -9	NO or REFUSED → 301
205	Do you know where to get a condom?	YES = 1 NO = 2 REFUSED = -9	NO or REFUSED → 209
206	Where can a person go to get a condom?  SELECT ALL THAT APPLY	CLINIC/HOSPITAL = A KIOSK/SHOP = B PHARMACY = C LOCAL FREE DISPENSER = D FRIENDS/PEERS = E BOYFRIEND/GIRLFRIEND = F OTHER = X SPECIFY: _____  DON'T KNOW = Y REFUSED = Z	
207	If you wanted to, could you yourself get a condom?	YES = 1 NO = 2 DON'T KNOW = 3 REFUSED = -9	Yes, DK, or Refused → 209  No → 208
208	Why is it not easy for you to get a condom?  SELECT ALL THAT APPLY.	TOO FAR = A COSTS TOO MUCH = B DO NOT WANT OTHERS TO KNOW = C OTHER = X SPECIFY: _____  DON'T KNOW = Y REFUSED = Z	

NO.	QUESTIONS	CODING CATEGORIES	SKIPS
209	<p>Have you ever seen a male condom demonstration?</p> <p>By a condom demonstration, I mean someone like a nurse, doctor, peer educator, health officer, or another trained adult showed you how a male condom is correctly used.</p>	<p>YES = 1 NO = 2 DON'T KNOW = 3 REFUSED = -9</p>	
<p>Interviewer says: "I will be asking a few questions about circumcision. Circumcision is the complete removal of the foreskin from the penis. If you feel comfortable, I can show you a picture of a completely circumcised penis."</p>			SKIP IF FEMALE
SHOW JOB AID TO PARTICIPANT.			
210	<p>Have you ever been circumcised? (ye wand lej gerezat for boys)</p>	<p>YES = 1 NO = 2 DON'T KNOW = 3 REFUSED = 4</p>	<p>DK, REFUSED → 218 NO → 213 SKIP IF FEMALE</p>
211	<p>How old were you when you were circumcised? Please give your best guess.</p> <p>RECORD AGE IN YEARS. CODE '0' IF LESS THAN ONE YEAR.</p>	<p>AGE IN YEARS _____ DON'T KNOW = -8 REFUSED = -9</p>	<p>Ask only if the answer to the previous question was yes. SKIP IF FEMALE</p>
212	<p>Who did the circumcision?</p>	<p>DOCTOR, NURSE, HEALTH OFFICER, MIDWIFE = 1 TRADITIONAL HEALER/ TRADITIONAL CIRCUMCISER/ TRADITIONAL BIRTH ATTENDANT = 2 FAMILY/FRIEND = 3 OTHER = 96 SPECIFY _____ DON'T KNOW = -8 REFUSED = -9</p>	<p>ALL → 218 SKIP IF FEMALE</p>
213	<p>Are you planning to be circumcised in the future?</p>	<p>YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9</p>	<p>Ask only if the child has not been circumcised. SKIP IF FEMALE</p>
<p>Interviewer says: "I will be asking a few questions about female circumcision. Female circumcision is the cutting or removal of flesh from the female genital area, and may include sewing the genital area shut after cutting."</p>			SKIP IF MALE
214	<p>Have you ever been circumcised? (yeset lej gerezat for girls)</p>	<p>YES = 1 NO = 2 DON'T KNOW = 3 REFUSED = 4</p>	<p>DK, REFUSED → 218 NO → 213 SKIP IF MALE</p>
215	<p>How old were you when you were circumcised? Please give your best guess.</p> <p>RECORD AGE IN YEARS. CODE '0' IF LESS THAN ONE YEAR.</p>	<p>AGE IN YEARS ____ DON'T KNOW = -8 REFUSED = -9</p>	<p>Ask only if the answer to the previous question was yes. SKIP IF MALE</p>

NO.	QUESTIONS	CODING CATEGORIES	SKIPS
216	Who did the circumcision?	DOCTOR, NURSE, HEALTH OFFICER, MIDWIFE = 1 TRADITIONAL HEALER/ TRADITIONAL CIRCUMCISER/ TRADITIONAL BIRTH ATTENDANT = 2 FAMILY/FRIEND = 3 OTHER = 96 SPECIFY _____ DON'T KNOW = -8 REFUSED = -9	ALL → 218 SKIP IF MALE
217	Are you planning to be circumcised in the future?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	Ask only if the child has not been circumcised. SKIP IF MALE
218	Have you had any of the following traditional procedures? READ THE PROCEDURES OUT ONE BY ONE AND CHECK ALL THAT APPLY.	UVULECTOMY (ENTELE MEGURET) = A GUM CUTTING (GEG MEBUWATET) = B SCARIFICATION (MEBTAT) = C TATOOING = D BODY PIERCING = E NONE OF THESE = F DON'T KNOW = Y REFUSED = Z	NONE OF THESE, DK, REFUSED → 301
219	Who performed the [ADTRBODMOD] procedure(s)?  CHECK ALL THAT APPLY.	DOCTOR, NURSE, HEALTH OFFICER, MIDWIFE = A TRADITIONAL HEALER/ TRADITIONAL CIRCUMCISER/ TRADITIONAL BIRTH ATTENDANT = B FAMILY/FRIEND = C OTHER = X SPECIFY _____ DON'T KNOW = Y REFUSED = Z	REPEAT FOR EACH RESPONSE TO 218

Interviewer says: "The next questions ask about sexual behavior. There is no right or wrong answer. Your responses will not be linked to you in any way or shared with anyone, including your parents."

PLEASE LOOK OUT FOR SIGNS OF DISTRESS IN CHILD WHEN ASKING THE FOLLOWING SEXUAL BEHAVIOR QUESTIONS. IF THE CHILD SEEMS DISTRESSED, ASK CHILD IF HE/SHE WANTS TO STOP THE INTERVIEW.

### MODULE 3: SEXUAL BEHAVIOR

301	Do you know what sex is?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP to 501
302	Have you ever had sex?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NEVER, DK, or REFUSED → 401

NO.	QUESTIONS	CODING CATEGORIES	SKIPS
303	How old were you when you had sex for the first time?	AGE IN YEARS ____  DON'T KNOW = -8 REFUSED = -9	Only ask this question of children who answered Yes to 302
304	The first time you had sex, was it because you wanted to or because you were forced?	WANTED TO = 1 FORCED = 2 DON'T KNOW = -8 REFUSED = -9	Only ask this question of children who answered Yes to 302
305	The first time you had sex, were you physically forced or were you pressured into having sex through harassment, threats or tricks?	PHYSICALLY FORCED = 1 PRESSURED = 2 DON'T KNOW = -8 REFUSED = -9	Ask this question of all children who answered Yes to 302 ALL → 307
306	What was the main reason that you had sex for the first time?	IT JUST HAPPENED = 1 MY FRIENDS PRESSURED ME TO HAVE SEX = 2 TO SHOW MY LOVE/TO FEEL LOVED = 3 I WANTED TO HAVE SEX = 4 MY BOYFRIEND/GIRLFRIEND WANTED TO HAVE SEX = 5 FOR MONEY / GIFTS = 6 I WANTED TO HAVE A BABY = 7 I WAS FORCED, PRESSURED, THREATENED OR TRICKED INTO HAVING SEX = 8 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = 9	Ask this question of all children who answered Yes to 302
307	How old was the person you first had sex with? Please give your best guess.	AGE IN YEARS ____ DON'T KNOW = -8 REFUSED = 9	Ask this question of all children who answered Yes to 302
308	The first time you had sex, was a condom used?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF DON'T KNOW WHAT CONDOM IS (If answered No or DK to 204)
309	In total, how many different people have you had sex with? Please give your best guess.	NUMBER OF PARTNERS ____ DON'T KNOW = -8 REFUSED = -9	Ask this question of all children who answered Yes to 302  CONSTRAINT CANNOT BE '0'.
310	The last time you had sex was a condom used?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF DON'T KNOW WHAT CONDOM IS (Don't ask if the child answered No or DK to 204)
311	How often do you use a condom during sex?	ALWAYS = 1 SOMETIMES = 2 NEVER = 3 DON'T REMEMBER = 4 DON'T KNOW = -8 REFUSED = -9	SKIP IF DON'T KNOW WHAT CONDOM IS (Don't ask if the child answered No or DK to 204)

NO.	QUESTIONS	CODING CATEGORIES	SKIPS
312	Have you ever had sex with someone because he/she provided you with, or you expected that he/she would provide you with money, gifts, food, shelter, or because he/she would help you to pay for school fees?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 314
313	In the last 12 months, when you've had sex with partners for these reasons, what have you received?  CHECK ALL THAT APPLY.	DID NOT RECEIVE ANYTHING = A MONEY = A FOOD = B SCHOOL FEES = C EMPLOYMENT = E GIFTS/FAVORS = F TRANSPORT = G SHELTER/RENT = H PROTECTION = I OTHER = X SPECIFY: _____ DON'T KNOW = Y REFUSED = Z	
314	Have you ever had sex with someone because he/she provided you with, or you expected that he/she would provide you with drugs or alcohol?  Drugs could include khat, hashish, marijuana, glue, heroin or other substances.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 316
315	What drugs or alcohol have you received from your partners in exchange for sex?  CHECK ALL THAT APPLY.	KHAT = A HASHISH = B GLUE (MASTISH) = C MARIJUANA = D COCAINE = E HEROIN = F OTHER = X SPECIFY: _____ DON'T KNOW = Y REFUSED = Z	
316	Have you ever been pregnant?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	GIRLS ONLY.
317	Have you ever talked with a parent or guardian about sex?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	

NO.	QUESTIONS	CODING CATEGORIES	SKIPS
<b>MODULE 4: SOCIAL NORMS, INTENTION TO ABSTAIN, SELF-EFFICACY AND ASSERTIVENESS</b>			
Interviewer says: "Now I would like to ask you some questions about the future."			
401	Do you think all, many, some, a few or none of your friends are having sex?	ALL = 1 MOST = 2 SOME = 3 A FEW = 4 NONE = 5 REFUSED = -9	SKIP IF child doesn't know what sex is. Answered 301 = NO, DK, REFUSED
402	Do you feel pressured by your boyfriend/girlfriend to have sex?	YES = 1 NO = 2 DON'T HAVE BOYFRIEND/ GIRLFRIEND=3 DON'T KNOW = -8 REFUSED = -9	SKIP IF 301 = NO, DK, REFUSED
403	Do you feel pressured by your friends to have sex?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF 301 = NO, DK, REFUSED
404	If you did not want to have sex with someone, could you tell them that you do not want to have sex with them?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	SKIP IF 301 = NO, DK, REFUSED
<b>MODULE 5: HIV RISK PERCEPTION</b>			
501	How likely do you think it is for you to get HIV?	VERY LIKELY = 1 SOMEWHAT LIKELY = 2 NOT LIKELY = 3 I ALREADY HAVE HIV = 4 DON'T KNOW = -8 REFUSED = -9	Skip if child hasn't heard of HIV. If child answered 201 = No, or Don't know or Refused (doesn't know what HIV is) → 901  IF child answers NOT LIKELY, DK, or REFUSED → 503  If child already has HIV → NEXT MODULE

NO.	QUESTIONS	CODING CATEGORIES	SKIPS
502	What is the main reason you think you are likely to get HIV?	I HAVE HAD SEX WITHOUT A CONDOM = 1 I HAVE OR HAD MANY BOY/GIRL FRIENDS = 2 I HAVE HAD BLOOD TRANSFUSIONS = 3 MY MOTHER/FATHER/CLOSE RELATIVE HAS HIV = 4 I DON'T TRUST MY BOY/GIRLFRIEND = 5 I AM SICK = 6 MY BOY/GIRL FRIEND IS SICK OR HAS DIED = 7 I DESERVE IT/I AM A BAD PERSON = 8 I HAVE TATOOS=9 I HAVE BEEN CUT BY A TRADITIONAL HEALER FOR CIRCUMCISION (YESET LEJ GEREZAT FOR GIRLS) = 10 I HAVE BEEN CUT BY A TRADITIONAL HEALER FOR BOYS (YE WAND LEJ GEREZAT FOR BOYS) = 11 I HAVE BEEN CUT BY A TRADITIONAL HEALTH FOR UVULECTOMY (ENTELE MEGURAT) = 12 I HAVE BEEN CUT BY A TRADITIONAL HEALER FOR HAD GUM CUTTING (GEG MEBUWATET) = 13 I HAVE SCARIFICATION (MEBTAT), BY A TRADITIONAL HEALER = 14 HAD BODY PIERCING = 15 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	If child answered 201 = No, or Don't know or Refused (doesn't know what HIV is) → 901  If the child doesn't know what sex is (answered No, DK, or Refused) → 301
503	What is the main reason you think you are not likely to get HIV?	I AM ABSTINENT =1 I WILL WAIT UNTIL MARRIAGE TO HAVE SEX=2 I ALWAYS USE CONDOMS=3 I TRUST MY PARTNER=4 I HAVE ONLY ONE PARTNER=5 I GO TO CHURCH =6 I AM A GOOD PERSON =7 I DRINK OR POUR HOLY WATER ON MYSELF=8 I AM CIRCUMCISED = 9 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	Skip if the child has not heard of HIV, or doesn't know what sex is, or doesn't know what a condom is.  If 201, 301 or 204 were answered as NO, DK, or REFUSED → 901

NO.	QUESTIONS	CODING CATEGORIES	SKIPS
<b>MODULE 6: HIV KNOWLEDGE</b>			
Interviewer says: "Now I would like to ask you some questions about what you know about some things related to HIV."			If child answered 201 = No, or Don't know or Refused (doesn't know what HIV is) → 901
601	Can a person reduce their chance of getting HIV by not having sex?	YES = 1 NO = 2 DON'T KNOW = 3 REFUSED = -9	If the child doesn't know what sex is (answered No, DK, or Refused) → 301
602	Can a person reduce their chance of getting HIV by using condoms when having sex?	YES = 1 NO = 2 DON'T KNOW = 3 REFUSED = -9	If the child doesn't know what a condom is (answered No, DK or Refused) → 204
603	Can a healthy-looking person have HIV or AIDS?	YES = 1 NO = 2 DON'T KNOW = 3 REFUSED = -9	Skip if the child hasn't heard of HIV.
604	Can a mother with HIV or AIDS pass HIV to her unborn baby?	YES = 1 NO = 2 DON'T KNOW = 3 REFUSED = -9	Skip if the child hasn't heard of HIV/AIDS.
605	Are there medicines that people with HIV or AIDS can take to help them live longer?	YES = 1 NO = 2 DON'T KNOW = 3 REFUSED = -9	Skip if the child hasn't heard of HIV/AIDS.
606	Can male circumcision help prevent HIV infection?  Circumcision is the removal of the foreskin from a penis.	YES = 1 NO = 2 DON'T KNOW = 3 REFUSED = -9	Skip if the child hasn't heard of HIV/AIDS.
607	Can female circumcision (yeset lej gerezat) be a risk factor for HIV infection?  Female circumcision is cutting and/or removal of skin in the genital area.	YES = 1 NO = 2 DON'T KNOW = 3 REFUSED = -9	
608	Can ARVs make people with HIV less likely to spread the virus?	YES = 1 NO = 2 DON'T KNOW = 3 REFUSED = -9	Skip if the child hasn't heard of HIV/AIDS.

NO.	QUESTIONS	CODING CATEGORIES	SKIPS
<b>MODULE 7: HIV TESTING</b>			
Interviewer says: "I would now like to ask you some questions about HIV testing."			If child hasn't heard of HIV (answered No, DK or Refused to 201) → NEXT MODULE
701	Have you ever been tested for HIV?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → NEXT MODULE
702	Did you receive the results of any of your HIV tests?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → NEXT MODULE
703	What was the result of that HIV test? SOME PARTICIPANTS MAY REPORT BEING TESTED MORE THAN ONCE. IF THEY REPORT GETTING A POSITIVE RESULT AND ANOTHER RESULT (I.E. A PREVIOUS NEGATIVE RESULT), SELECT POSITIVE.	HIV POSITIVE = 1 HIV NEGATIVE = 2 UNKNOWN/DON'T KNOW = 3 REFUSED = -9	HIV NEGATIVE, UNKNOWN, REFUSED → NEXT MODULE
704	Are you currently on treatment for HIV?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
<b>MODULE 8: HIV STIGMA</b>			
Interviewer says: "Now I would like to ask you some more question about HIV."			IF (201 = NO, DK, REFUSED) OR if 703 = HIV POSITIVE) OR if 501 = 4 (I ALREADY HAVE HIV) → NEXT MODULE
801	Would you be willing to share food with someone who has HIV?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
802	Would you be friends with someone who has HIV?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
803	Would you be comfortable to have a teacher who has HIV?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	

NO.	QUESTIONS	CODING CATEGORIES	SKIPS
<b>MODULE 9: ALCOHOL AND DRUGS</b>			
Interviewer says: "I would like to ask you some questions about alcohol and drugs or substances that you may have taken that were not given to you by doctor. Your answers will not be told to anyone, even your parents."			
901	Have you ever had alcohol, for example beer, tej, wine, or tela araki?  SHOW GRAPHIC OF COMMON ALCOHOLIC BEVERAGES.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 903
902	During the past 1 month, on how many days did you have at least one drink containing alcohol?	NUMBER OF DAYS ____ DON'T KNOW = -8 REFUSED = -9	MAX = 31
903	Have you ever tried drugs such as khat, hashish, glue (mastish), marijuana, cocaine, heroin, or others?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	NO, DK, REFUSED → 801
904	What drugs have you ever tried?  DO NOT READ RESPONSES.  PROBE FOR MULTIPLE RESPONSES.	KHAT = A HASHISH = B GLUE (MASTISH) = C MARIJUANA = D COCAINE = E HEROIN = F OTHER = X SPECIFY: _____ DON'T KNOW = Y REFUSED = Z	
<b>MODULE 10: PARENTAL SUPPORT</b>			
1001	Do your parents/guardians understand your problems and worries?	ALWAYS = 1 MOST OF THE TIME = 2 SOMETIMES = 3 RARELY = 4 NEVER = 5 DON'T KNOW = -8 REFUSED = -9	
1002	Do you talk to your parents/guardians when something is bothering you?	ALWAYS = 1 MOST OF THE TIME = 2 SOMETIMES = 3 RARELY = 4 NEVER = 5 DON'T KNOW = -8 REFUSED = -9	

NO.	QUESTIONS	CODING CATEGORIES	SKIPS
1003	Do your parents/guardians really know what you were doing with your free time when you were not at school or work?	ALWAYS = 1 MOST OF THE TIME = 2 SOMETIMES = 3 RARELY = 4 NEVER = 5 DON'T KNOW = -8 REFUSED = -9	
<b>MODULE 11: VIOLENCE</b>			
Interviewer says: "Now I would like to ask you questions about some other important aspects of a person's life. I know that some of these questions are very personal. However, your answers are important for helping to understand the condition of children in Ethiopia. Let me assure you that your answers are completely confidential and will not be told to anyone. You can stop at any time or refuse to answer any question."			
1101	Has anyone ever done any of these things to you:  Check all that apply.	PUNCHED=1 SLAPPED=2 KICKED=3 WHIPPED=3 BEAT YOU WITH AN OBJECT=4 CHOKED, SMOTHERED =4 TRIED TO DROWN YOU=5 BURNT YOU INTENTIONALLY=6 USED OR THREATENED YOU WITH A KNIFE, GUN, OR OTHER WEAPON?=7 OTHER TYPE OF VIOLENCE = 8 SPECIFY _____ DON'T KNOW = 9 REFUSED = 10	
1102	Has anyone ever touched your private body parts when you did not want them to? The private body parts are where you pee and poop; for girls, this also includes the breast area. This unwanted touching could include pinching, grabbing, rubbing or touching.	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	Ask of all adolescents 13+  NO, DK, REFUSED → 1104

NO.	QUESTIONS	CODING CATEGORIES	SKIPS
1103	The first time this happened, what was your relationship to the person who did this? If it was more than one person, what was your relationship with the person you knew the best?	BOYFRIEND/GIRLFRIEND/ SPOUSE = 1 RELATIVE/FAMILY MEMBER = 2 CLASSMATE/SCHOOLMATE = 3 TEACHER = 4 POLICE/SECURITY OFFICER/ MILITARY = 5 EMPLOYER = 6 NEIGHBOR = 7 COMMUNITY RELIGIOUS LEADER = 8 FRIEND = 9 STRANGER = 10 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	Skip if the answer to 1102 = No, DK, or Refused.
1104	Has anyone ever tried to make you have sex against your will but did not succeed?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	Skip this question if the child answered No to 301. (If child doesn't know what sex is).
1105	Has anyone ever pressured you to have sex, through harassment, threats or tricks and did succeed?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
1106	Has anyone ever physically forced you to have sex and did succeed?	YES = 1 NO = 2 DON'T KNOW = -8 REFUSED = -9	
1107	The first time you were pressured or forced to have sex against your will, what was your relationship to the person who did this?	BOYFRIEND/GIRLFRIEND/ SPOUSE = 1 RELATIVE/FAMILY MEMBER = 2 CLASSMATE/SCHOOLMATE = 3 TEACHER = 4 POLICE/SECURITY OFFICER/ MILITARY = 5 EMPLOYER = 6 NEIGHBOR = 7 COMMUNITY RELIGIOUS LEADER = 8 FRIEND = 9 STRANGER = 10 OTHER = 96 SPECIFY: _____ DON'T KNOW = -8 REFUSED = -9	Skip this question if the child answered No to 301. (If child doesn't know what sex is) or if child never had forced sex/ if 1105 = NO, DK, REFUSED AND 1106 = NO, DK, REFUSED

NO.	QUESTIONS	CODING CATEGORIES	SKIPS
1108	<p>After any of these unwanted sexual experiences, did you try to seek professional help or services from any of the following?</p> <p>SELECT ALL THAT APPLY.</p>	<p>I DID NOT TRY TO SEEK HELP = A            HEALTHCARE PROFESSIONAL = B            POLICE OR OTHER SECURITY OR LAW ENFORCEMENT PERSONNEL = C            SOCIAL WORKER, COUNSELOR OR NGO = D            RELIGIOUS LEADER = E            TEACHER = F            OTHER = X            SPECIFY: _____            DON'T KNOW = Y            REFUSED = Z</p>	<p>ALL BUT I DID NOT TRY TO SEEK HELP → 1110</p> <p>SKIP IF the child answered No to 301. (If child doesn't know what sex is) or 1102 = NO, DK, REFUSED &amp; 1104 = NO, DK, REFUSED &amp; 1105 = NO, DK, REFUSED, &amp; 1106 = NO, DK, REFUSED</p>
1109	<p>What was the main reason that you did not try to seek professional help or services?</p>	<p>DID NOT KNOW SERVICES WERE AVAILABLE = 1            SERVICES NOT AVAILABLE = 2            AFRAID OF GETTING IN TROUBLE = 1            ASHAMED FOR SELF/FAMILY = 2            COULD NOT AFFORD SERVICES = 3            DID NOT THINK IT WAS A PROBLEM = 5            FELT IT WAS MY FAULT = 6            AFRAID OF BEING ABANDONED = 7            DID NOT NEED/WANT SERVICES = 8            OTHER = 96            SPECIFY: _____            DON'T KNOW = -8            REFUSED = -9</p>	<p>Skip if the answer to 1108 is No</p>
1110	<p>After any of these unwanted sexual experiences, did you tell anyone about it?</p>	<p>YES = 1            NO = 2            DON'T KNOW = -8            REFUSED = -9</p>	<p>NO, DK, REFUSED → END</p>
1111	<p>Which of the following describes who you told about any of these unwanted sexual experience?</p> <p>READ RESPONSES ALOUD.</p> <p>SELECT ALL THAT APPLY</p>	<p>PARENT/GUARDIAN = A            SIBLING = B            TEACHER = C            FRIEND/CLASSMATE = D            OTHER FAMILY MEMBER = E            RELIGIOUS LEADER = F            HEALTH CARE PROFESSIONAL = G            POLICE OR OTHER SECURITY OR LAW ENFORCEMENT PERSONNEL = H            SOCIAL WORKER, COUNSELOR OR NGO = I            OTHER = X            SPECIFY: _____            DON'T KNOW = Y            REFUSED = Z</p>	<p>Skip if child did not have unwanted sexual experience</p>
<p>Interviewer says: "Thank you for sharing your personal experiences with me. I know it may have been difficult for you to talk about your experiences with me. If you would like to talk further about these experiences, I can refer you to a place that can provide you with help."</p> <p>PROVIDE PARTICIPANT WITH LIST OF ORGANIZATIONS.</p>			<p>SKIP IF NEVER EXPERIENCED SEXUAL OR PHYSICAL VIOLENCE</p>

## APPENDIX H CONSENT FOR HOUSEHOLD INTERVIEW

**Consent for Household Interview [adults 15-64] and Emancipated minors (13-17) [DO NOT READ BELOW]**  
**Study title: Ethiopia Population-based HIV Impact Assessment (EPHIA)**

**Principal Investigator:** Prof Sileshi Lulseged; Project Lead, EPHIA/ICAP Ethiopia

**Phone Number:** +251911228496

**Co-Investigator/Study Coordinator:** Mr. Terefe Gelibo, Project Coordinator, EPHIA/ICAP

**Ethiopia Phone Number:** +251912139705

**Interviewer reads:**

**What language do you prefer for our discussion today?**

English  Amharigna  Oromiffa  Tigrigna  Afarigna  Somaligna

Other Language: Specify \_\_\_\_\_

**Title of Survey: Ethiopia Population-Based HIV Impact Assessment**

Hello. My name is \_\_\_\_\_. I would like to invite you to take part in this research study about HIV in Ethiopia. The Ministry of Health (MoH) is leading this survey and is conducting it with the United States Centers for Disease Control and Prevention (CDC), ICAP at Columbia University and the Ethiopian Public Health Institute (EPHI).

### **Purpose of survey**

This survey will help us know how many people in Ethiopia have HIV and need health services. It will also tell us about people's risk for getting HIV. We plan to ask about 19,000 people, ages 15-64 years, and 5,000 children, ages 0-14 years, from about 12,000 households to join this survey. If you join, your taking part will help the MoH make health services better in the country.

### **Survey Procedures**

There are two parts to this survey- a household interview and individual interviews. In the household interview, we would like to ask you some questions about the people who live here and some of the things you have or own. The interview will take up to 45 minutes.

After the household interview, we will invite you and others living in your household to take part in individual interviews. We will also offer an HIV test after the interview. If you or any members of your household are positive for HIV, we will also offer you Hepatitis B and Syphilis tests. We will ask each person to give permission to take part before joining the survey.

### **Right to refuse or withdraw**

You do not have to take part in the survey. If you choose to join the survey, you may change your mind at any time and stop taking part. If you decide not to take part, it will not affect your healthcare in any way.

### Risks and Benefits

The risks to taking part in the household interview are small. You may feel uncomfortable about some of the questions we will ask. You can refuse to answer any question. Maximum effort will be made to keep your information private. If you take part, you and your household members will get free testing for HIV in your own home. If you or any members of your household are positive for HIV, you may also receive free testing for Hepatitis B and Syphilis in your own home. The information you provide will also be used to improve the health of Ethiopia. Your responses will help us develop more effective programs to fight HIV and other diseases in Ethiopia.

There is no cost to you for being part of the survey. You will not be paid.

### Confidentiality and Access to Your Health Information

What we talk about will be kept private, even from your family, and will not be shown to anyone outside of the survey team. Your answers to the questions will be identified only by a number and not your name. Your name or any other identifying information will not appear on any survey results that we share with the MoH, the public or in data analysis. The information we collect during the survey will not be released outside of the survey groups listed unless there is an issue of safety.

[DO NOT READ ALOUD]

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

- Staff members from the Institutional Review Boards or Ethics Committees overseeing the conduct of this survey to ensure that we are protecting your rights as a person taking part. These include CDC, Columbia University, Westat (a statistical survey research organization, EPHI IRB and the National Research Ethics Review Committee (NRERC) of Ethiopia
- The U.S. Office of Human Research Protections and other government agencies that oversee the safety of human subjects to ensure we are protecting your rights as a person taking part in this survey
- Study staff and study monitors

Your permission to allow us to use and share your information with the groups above will expire five years after the end of the survey. If you want to leave the study, have any questions about the survey, or feel that you have been harmed by taking part, you should contact:

Yimam Getaneh

Address: Ethiopian Public Health Institute, PO Box 1242, Addis Ababa, Ethiopia.  
Office Phone: +251 112788058; Mobile Phone: Tel: +251 912 002053; Fax: 25112758634.  
E-mail: yimamgetaneh@gmail.com

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

Dr. Getachew Addis

Address: EPHI Scientific and Ethics Review Office, P.O Box 1242, Addis Ababa,  
Ethiopia Office Phone: +251-118-685503/15; Mobile Phone: +251 944123110  
E-mail: get\_ast@yahoo.com;

Mr. Yohannes Sitotaw

Address: National Research Ethics Review Committee, P.O Box 2490, Addis Ababa,  
Ethiopia Office Phone: +251011-4-674353; Mobile Phone: +251 913906779  
E-mail: nrerc2015@gmail.com; Fax: +251-011-4-660241

**Do you want to ask me anything about the survey?**

**Consent Statement**

Any questions that I had have been answered satisfactorily.. I have been offered a copy of this consent form.

Do you agree to do the household interview? 'YES' means that you agree to do the interview. 'NO' means that you will NOT do the interview.

\_\_\_\_ Yes \_\_\_\_ No

Head of household signature or mark \_\_\_\_\_ Date: \_\_/\_\_/\_\_

Printed name of head of household \_\_\_\_\_

Household ID number \_\_\_\_\_

**[For illiterate participants]**

Signature of witness \_\_\_\_\_ Date: \_\_/\_\_/\_\_

Printed name of witness \_\_\_\_\_

Signature of person obtaining consent \_\_\_\_\_ Date: \_\_/\_\_/\_\_

Printed name of person obtaining consent \_\_\_\_\_

Survey staff ID number \_\_\_\_\_

**Adult (18 years and older) and Emancipated Minors (13-17 years); individual consent for interview and blood testing****Interviewer reads:**

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

**What language do you prefer for our discussion today?**

English \_\_\_\_, Amharigna \_\_\_\_, Oromiffa \_\_\_\_, Tigrigna \_\_\_\_, Afarigna \_\_\_\_, Somaligna \_\_\_\_.

**Title of Survey:** This survey is called the **Ethiopia Population Based Impact Assessment (EPHIA, 2017)**

**Purpose of the survey**

This survey will help us to know how many people in Ethiopia are living with HIV and need health services. It will also tell us about people's risk for HIV and who has been infected recently. We will approach about 25,000 men, women, and children from about 12,000 households throughout the urban areas of Ethiopia to take part in this survey. We would like to invite you to join the survey too, even if you already know your HIV status. Your taking part will help the Ministry of Health make health services better in the country.

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

**Survey Procedures**

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

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

Survey procedures also include blood draw, an HIV test and storage of that blood for future testing if you agree to this. The testing and counseling will take about 45 minutes. You may agree to the interview without agreeing to give your blood.

If you agree to the testing, a survey staff member who has been trained to draw blood will take about 14 milliliters (less than 1 tablespoon) of blood from your arm into two tubes. If it is not possible to take blood from your arm, then we will try to take a few drops of blood from your finger. We will give you the results of your HIV test, and provide counseling on the same day.

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

For adults who test positive for HIV, we may also offer Hepatitis B and Syphilis tests. Like HIV, Hepatitis B and Syphilis are infections that can cause very serious illnesses if left untreated. We will give you the results of your Hepatitis B and Syphilis tests and provide counseling about the results on the same day as the test. If you are positive for Hepatitis B and/or Syphilis, we will give you a referral form and information so that you can consult with a doctor or nurse to learn more about the test result and where you can access treatment and care.

If you test positive for HIV, we will send your blood to a laboratory to measure your viral load. Viral load is the amount of HIV in your blood. The results will be sent to a health facility of your choosing in about 8-12 weeks from now. You will be able to talk to a nurse or doctor at that facility about your viral load. Some of your blood will be sent to a laboratory out of the country for some additional tests related to HIV because there are no laboratories in Ethiopia that can do the tests. If we have test results that might help guide your treatment, and if you have given us your contact information, we will contact you to tell you how you and your doctor or nurse may get these results.

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

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

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

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

#### **Use of survey findings**

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

#### **Right to refuse or withdraw**

You do not have to take part in the survey interview or give blood and you are free to change your mind even after you have started the interview and/or the blood draw. If some of the questions make you feel uncomfortable you may decide not to answer or you may skip them and move to the next question. You may agree to let us test your blood for HIV, CD4 counts, and other lab testing but not agree to have your blood stored for future research tests. Your taking part is voluntary. If you decide not to take part, it will not affect your healthcare in any way.

## Risks

The risks involved with taking part in the survey are small. Maximum effort will be made to keep your information private. You may feel uncomfortable about some of the questions we will ask. You can refuse to answer any question.

The risks to you from having your blood drawn are very small. They include brief pain from the needle stick, bruising, lightheadedness, bleeding and rarely, infection where the needle enters the skin. The survey staff member who will take your blood has received training on how to draw blood. If you experience any discomfort or any of the symptoms mentioned above, please let us know, and especially if there is any bleeding or swelling.

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

## Benefits

The main benefit for you to be in the survey is the chance to learn more about your health today. Some people who take part will test HIV positive. If you test HIV positive, the benefit is that you will learn your HIV-positive status and where to go for HIV services. HIV care and treatment provided by the Ministry of Health is free. If you already know you have HIV and are not on treatment, you will get information to help your doctor or nurse determine if you are ready to start treatment. If you already know that you are HIV positive and you are on HIV treatment, the CD4 and viral load tests can help your nurse or doctor judge how well your treatment is working. If you test HIV negative, you will learn about what you can do to stay HIV negative. Your taking part in this research could help us learn more about HIV in Ethiopia. It can also help us learn about how HIV prevention and treatment programs are working in the country. Your taking part is important, and you are invited to participate even if you already know that you are HIV negative or positive.

## Confidentiality

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

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

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



This survey has received approval from EPHI, The Centers for Disease Control and Prevention, and the Institutional Review Boards of Columbia University Medical Center, and of Westat.

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

Dr. Desta Kassa

Address: Ethiopian Public Health Institute, PO Box 1242, Addis Ababa, Ethiopia.  
Office Phone: +251 112788058; Mobile Phone: Tel : +251 911 479212; Fax: 25112758634.  
E-mail: dkassa2003@gmail.com

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

Dr. Getachew Addis

Address: EPHI Scientific and Ethics Review Office, P.O Box 1242, Addis Ababa,  
Ethiopia Office Phone: +251-118-685503/15; Mobile Phone: +251 944123110  
E-mail: get\_ast@yahoo.com;

Mr. Yohannes Sitotaw

Address: National Research Ethics Review Committee, P.O Box 2490, Addis Ababa,  
Ethiopia Office Phone: +251011-4-674353; Mobile Phone: +251 913906779  
E-mail: nrerc2015@gmail.com; Fax: +251-011-4-660241

**Do you want to ask me anything about the survey?**

### Consent Statement

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

Make your initial or mark if you agree to take part in the survey interview, 'YES' means that you agree to participate in the survey interview. 'NO' means that you will NOT take part in the survey interview.

\_\_\_\_ Yes \_\_\_\_ No

(If "Yes" proceed to the next question)

Make your initial or mark if you agree to give blood for testing, 'YES' means that you agree to give blood for testing. 'NO' means that you will NOT give blood for testing.

\_\_\_\_ Yes \_\_\_\_ No

(If "Yes" proceed to the next question)

Make your initial or mark if you agree to be contacted for future research, 'YES' means that you agree to be contacted for future research. 'NO' means that you won't be contacted for future research. \_\_\_\_ Yes \_\_\_\_ No

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

\_\_\_\_ Yes \_\_\_\_ No

**[Tablet summary statement]**

To confirm, you have agreed to <INSERT ALL OPTIONS MARKED YES: INTERVIEW, BLOOD TESTING, FUTURE RESEARCH, BLOOD STORAGE>, is this correct? \_\_\_\_ Yes \_\_\_\_ No

Participant signature or mark \_\_\_\_\_ Date: \_\_/\_\_/\_\_

Printed name of participant \_\_\_\_\_

**[For participants who cannot read and/or write]**

Signature of witness \_\_\_\_\_ Date: \_\_/\_\_/\_\_

Printed name of witness \_\_\_\_\_

Signature of person obtaining consent \_\_\_\_\_ Date: \_\_/\_\_/\_\_

Printed name of person obtaining consent \_\_\_\_\_

Survey staff EPHIA ID number \_\_\_\_\_

**Parental permission/consent from adult parent/guardian to interview participants 12-17 years and conduct blood testing on participants 0-17 years**

**Participation duration:** 45 min

**Anticipated number of research participants at this site:** 24,846

**Sponsor/Supporter:** PEPFAR Award #1U2GGH001226

**Principal Investigator:** Prof Sileshi Lulseged; Project Lead, EPHIA/ICAP Ethiopia

**Phone Number:** +251911228496

**Co-Investigator/Study Coordinator:** Mr. Terefe Gelibo, Project Coordinator, EPHIA/ICAP Ethiopia

**Phone Number:** +251912139705

#### **Interviewer reads:**

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

#### **Study title: Ethiopia Population-based HIV Impact Assessment (EPHIA)**

#### **Purpose of the survey**

HIV is the virus that causes AIDS. AIDS is a very serious illness. This study will help us know how many people in Ethiopia have HIV and need health services. It will also tell us about people's risk for getting HIV. This survey will also help us learn more about the health of children in Ethiopia. We plan to ask about 5,000 children like your son/daughter to join this survey. We would like to invite him/her to join the survey too, even if his/her HIV status is already known. His/her taking part will help the Ministry of Health (MoH) make health services better in the country.

Now I would like to ask you to let your child take part in the survey. Your child's taking part will help the MoH make HIV services for children and families better.

#### **Survey Procedures**

##### **[For children ages <18 months old]**

We would like to test your child for HIV. We are doing this for all children in the survey regardless of their parent or guardian's HIV status. A nurse, who has been trained to draw blood, will take about 5 to 10 drops of blood from your child's heel into a small tube. The blood will be used to perform a test here today to assess whether your child has been exposed to HIV. We will also place a few drops of blood onto a card which will be sent to the National Laboratory at Ethiopia Public Health Institute (EPHI).

The body makes antibodies to fight HIV. Antibodies from a mother with HIV can enter the baby's blood during pregnancy. The test we perform on your child today will let us know if your child has been exposed to HIV. If it is positive, it does not mean your child has the virus in his/her blood. It just confirms that he/she has been exposed to HIV. We will need to send your child's blood to a lab at EPHI for a special test for children younger than 18 months old, to confirm if he/she has HIV. If you provide us with the name of a health facility, we can send the result there in about 8 weeks if the result is positive and 10 weeks if the result is negative. We will also contact you to inform you that the results have been sent to the facility, if you provide us with your contact information. You will be able to talk to a doctor or nurse at the facility about the test result.

For all children who test positive for HIV and some randomly selected children without HIV, we will also test the amount of CD4 cells in his/her blood and give you the result on the same day as the test. CD4 cells are the part of your immune

system that fights HIV infection and other diseases. We will give you a referral form and information so that your child can consult with a doctor or nurse to learn more about his/her HIV test, CD4 counts, and health.

If your child tests positive for HIV, we will also send his/her blood to a laboratory for more tests. One of these tests will be to measure his/her viral load. Viral load is the amount of HIV in the blood. If you provide us with the name of a health facility, we can send your child's viral load results there in about 10-12 weeks from now. Some of your child's blood will be sent to a laboratory out of the country for some additional tests related to HIV because there are no laboratories in Ethiopia that can do the tests. If we have test results that might guide your child's care or treatment, we will contact you to tell you how you and your child's doctor or nurse may get these results.

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

**[For children ages 18 months – 23 months old]**

We would like to test your child for HIV. We are doing this for all children in the survey regardless of their parent or guardian's HIV status. A survey staff member, who has been trained to draw blood, will take about 5 to 10 drops of blood from your child's heel into a small tube and perform an HIV test here in your home. We will give you the results and provide counseling about the results on the same day as the test. We will also discuss with you how to share the results with your child if you decide to discuss the results with him/her. The entire testing and counseling session will take about 45 minutes.

For all children who test positive for HIV and some randomly selected children without HIV, we will also test the amount of CD4 cells in his/her blood and give you the result on the same day as the test. CD4 cells are the part of your immune system that fights HIV infection and other diseases. We will give you a referral form and information so that your child can consult with a doctor or nurse to learn more about his/her HIV test, CD4 counts, and health.

We will also send his/her blood to a laboratory for more tests. One of these tests will be to measure his/her viral load. Viral load is the amount of HIV in the blood. If you provide us with the name of a health facility, we can send your child's viral load results there in about 10-12 weeks from now. Some of your child's blood will be sent to a laboratory out of the country for some additional tests related to HIV because there are no laboratories in Ethiopia that can do the tests. If we have test results that might guide your child's care or treatment, we will contact you to tell you how you and your child's doctor or nurse may get these results.

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

**[For children ages 24 months -11 years old]**

We would like to test your child for HIV. We are doing this for all children in the survey regardless of their parent or guardian's HIV status. A survey staff member, who has been trained to draw blood, will take about 6 milliliters of blood (a little over a teaspoonful) from your child's arm into two tubes and perform an HIV test here in your home. If it is not possible to take blood from your child's arm, then we will take a few drops of blood from your child's finger and then perform the HIV test here in your home. We will give you the results and provide counseling about the results on the same day as the test. We will also discuss with you how to share the results with your child if you decide to discuss the results with him/her. If you would like, we can discuss the test results together with your child. The entire testing and counseling session will take about 45 minutes.

For all children who test positive for HIV and some randomly selected children without HIV, we will also test the amount of CD4 cells in his/her blood and give you the result on the same day as the test. CD4 cells are the part of your immune system that fights HIV infection and other diseases. We will give you a referral form and information so that your child can consult with a doctor or nurse to learn more about his/her HIV test, CD4 counts, and health.

We will also send his/her blood to a laboratory for more tests. One of these tests will be to measure his/her viral load. Viral load is the amount of HIV in the blood. If you provide us with the name of a health facility, we can send your child's viral load results there in about 10-12 weeks from now. Some of your child's blood may be sent to a laboratory out of the country for some additional tests related to HIV because there are no laboratories in Ethiopia that can do the tests. If we have test results that might guide your child's care or treatment, we will contact you to tell you how you and your child's doctor or nurse may get these results.

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

**[For children ages 12-14 years old]**

If both you and your child agree for him/her to join the survey, we will ask your child some questions. The interview will be conducted in private with only the child and a survey staff member. The interview will include questions about education, HIV prevention and treatment, social behavior, and his/her experiences in the household. It will take about 45 minutes.

We would like to test your child for HIV. We are doing this for all children in the survey, whether they are sexually active or not. We will test all children regardless of their parent or guardian's HIV status. A survey staff member, who has been trained to draw blood, will take about 6 milliliters of blood (a little over a teaspoonful) from your child's arm into two tubes and perform an HIV test here in your home. If it is not possible to take blood from your child's arm, then we will try to take a few drops of blood from your child's finger and then perform the HIV test here in your home. We will give you the results and provide counseling about the results on the same day as the test. We will also discuss with you how to share the results with your child if you decide to discuss the results with him/her. If you would like, we can discuss the test results together with your child. The entire testing and counseling session will take about 45 minutes.

For all children who test positive for HIV and some randomly selected children without HIV, we will also test the amount of CD4 cells in his/her blood and give you the result on the same day as the test. CD4 cells are the part of your immune system that fights HIV infection and other diseases. We will give you a referral form and information so that your child can consult with a doctor or nurse to learn more about his/her HIV test, CD4 counts, and health.

We will also send his/her blood to a laboratory for other tests. One of these tests will be to measure his/her viral load.

Viral load is the amount of HIV in the blood. If you provide us with the name of a health facility, we can send your child's viral load results there in about 10-12 weeks from now. Some of your child's blood may be sent to a laboratory out of the country for some additional tests related to HIV because there are no laboratories in Ethiopia that can do the tests. If we have test results that might guide your child's care or treatment, we will contact you to tell you how you and your child's doctor or nurse may get these results.

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

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

#### **[Children 15-17 years old]**

If both you and your child agree for him/her to join the survey, we will ask your child some questions. The interview will be conducted in private with only the child and a survey staff member. The interview questions will be the same as the ones that we ask adults who agree to take part in the survey. The questions will be about what kind of work they do, whether they have had any experience with health services, and their social and sexual behaviors. It will take about 45 minutes.

We would like to test your child for HIV. We are doing this for all children in the survey, whether they are sexually active or not. We will test all children regardless of their parent or guardian's HIV status. A survey staff member, who has been trained to draw blood, will take about 14 milliliters of blood (less than 1 tablespoonful) from your child's arm into two tubes and perform an HIV test here in your home. If it is not possible to take blood from your child's arm, then we will try to take a few drops of blood from your child's finger and then perform the HIV test here in your home. We will give the results to your child and provide counseling about the results on the same day as the test. We will also discuss with him/her how to share the results with you if he/she decides to discuss the results with you. The entire testing and counseling session will take about 45 minutes.

For all children who test positive for HIV and some randomly selected children without HIV, we will also test the amount of CD4 cells in his/her blood and give your child the result on the same day as the test. CD4 cells are the part of his/her immune system that fights HIV infection and other diseases. We will give him/her a referral form and information so that he/she can consult with a doctor or nurse to learn more about his/her HIV test, CD4 counts, and health.

Children ages 15-17 who test positive for HIV we will also be tested for Hepatitis B and Syphilis infections. Like HIV, Hepatitis B and Syphilis are infections that can cause very serious illnesses if left untreated. We will give the Hepatitis B and Syphilis test results to your child and provide counseling about the results on the same day as the test. We will also discuss with him/her how to share the results with you if he/she decides to discuss the results with you. We will give him/her a referral form and information so that he/she can consult with a doctor or nurse to learn more about his/her Syphilis or Hepatitis B test.

We will also send his/her blood to a laboratory for additional tests. One of these tests is to measure his/her viral load. Viral load is the amount of HIV in the blood. If he/she provides us with the name of a health facility, we can send his/her viral load results there in about 8-10 weeks from now. Some of your child's blood will be sent to a laboratory out of the country for some additional tests related to HIV because there are no laboratories in Ethiopia that can do the tests. If we have test results that might guide your child's care or treatment, we will contact him/her to tell him/her how he/she

and a doctor or nurse at the preferred health facility may get these results.

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

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

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

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

#### **Use of survey findings**

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

#### **Right to refuse and to withdraw**

It is your decision about whether you will allow us to invite your child to join the survey. Your child does not have to be in the survey or give blood. You or your child may stop taking part at any time. If your child is in the age group interviewed and does not want to answer some of the questions he/she may skip them and move to the next question. If your child does not take part, it will not affect your child's healthcare in any way.

You may agree for your child's blood to be tested in relation to this survey, but not agree for the blood to be stored for future research tests. Your child's taking part is voluntary. If you or your child decides not to take part, it will not affect your healthcare in any way.

#### **Risks**

[For children 12-17] During the interview, your child may feel uncomfortable answering some of the questions. We do not wish this to happen, and your child does not have to answer questions he/she feels are too personal or that make them feel uncomfortable.

[For all children 0-17] The risks to your child from having his/her blood drawn are very small. They include brief pain from the needle stick, bruising, lightheadedness, bleeding and rarely, infection where the needle enters the skin. The survey staff member who will take his/her blood has received training on how to draw blood. If he/she has any discomfort or any of the symptoms we've mentioned above, please let us know, and especially if there is any bleeding or swelling.

[For children 15-17] Your child may learn that he/she is HIV, Syphilis or Hepatitis B positive. Learning that he/she has

these diseases may cause some emotional and/or psychological distress. He/she will receive counseling on how to cope with learning that he/she has HIV, Syphilis, or Hepatitis B. If he/she tests positive with any of the HIV, Hepatitis B or Syphilis tests, we will help identify where to go and explain the options available for care and treatment.

**[For children 0 -14 years]** You may learn that your child is HIV positive. Learning that your child has HIV may cause you some emotional and/or psychological distress. You will decide when and where to give your child the test results. We will provide you with counseling on how to cope with learning that your child has HIV. If your child tests HIV positive, we will help you identify where to go and explain the options available for care and treatment. Care and treatment for HIV is available at government facilities free of charge.

### Benefits

**[For children 0-14]** The main benefit for your child to be in the survey is the chance to learn more about his/her health today. If your child tests as part of the survey you will learn his/her HIV status. Some children who take part will test HIV positive. If this happens to your child, the benefit is that you will learn his/her HIV-positive status and you will learn where to take your child for HIV services. HIV care and treatment provided by government facilities is free of charge. If you already know that your child is HIV positive and he/she is on treatment, the CD4 and viral load tests can help your doctor or nurse judge how well the treatment is working. If your child tests HIV negative, you will learn about what you can do to keep your child HIV negative. Your child's taking part in this research could help us learn more about children and HIV in Ethiopia. It can also help us learn about how HIV prevention and treatment programs are working in the country. You and your child's taking part are important, even if you already know that your child is HIV negative or positive.

**[For children 15-17]** The main benefit for your child to be in the survey is the chance for your child to learn more about his/her health today. If your child takes part in the survey he/she will learn his/her HIV status. Some children who take part will test HIV positive. If this happens to your child, the benefit is that he/she will learn about his/her HIV-positive status and he/she will learn where to go for HIV services. HIV care and treatment provided by government facilities is free of charge. If you or your child already knows that he/she is HIV positive and he/she is on treatment, the CD4 and viral load tests can help his/her doctor or nurse judge how well the treatment is working.

If your child tests positive for HIV, he/she will also be offered tests for Hepatitis B and Syphilis. He/she will learn about Hepatitis B and Syphilis and will learn where to go for care and treatment for Hepatitis B and Syphilis services.

If your child tests HIV negative, your child will learn about what he/she can do to keep himself/herself HIV negative. Your child's taking part in this research could help us learn more about children and HIV in Ethiopia. It can also help us learn about how HIV prevention and treatment programs are working in the country. You and your child's taking part are important, even if you already know that your child is HIV negative or positive.

### Confidentiality

We will do everything we can to keep your child's taking part in the survey confidential. The information we collect from you and your child in this computer will be identified by a number and not by your name or your child's name. Your child's name and other personal information will be stored in a confidential manner, accessible only by survey staff. Your name and your child's name will not appear when we share survey results. Only survey staff will have access to the data during the survey. However, in accordance with the Children's Protection and Welfare Act, we are required to report any instances of children in imminent danger to the appropriate authority.

**[For children 12-17]** Your child may choose to tell you about the interview but he/she does not have to do this. We will not be sharing with you responses given by your child. The following individuals and/or agencies will be able to look at your interview records to help oversee the conduct of this survey:

- Staff members from the Institutional Review Boards or Ethics Committees which oversee the conduct of this

survey to ensure that we are protecting your rights as a person taking part, the staff members include:

- EPHI
  - The Centers for Disease Control and Prevention (CDC; Atlanta, USA)
  - Columbia University Medical Center
  - Westat (a statistical survey research organization).
- The U.S. Office of Human Research Protections may examine the study records to ensure we are protecting your rights as a person taking part in this survey.
- Selected survey staff and survey monitors.

This survey has received approval from the EPHI, The Centers for Disease Control and Prevention, and the Institutional Review Boards of Columbia University Medical Center, and of Westat.

The information we collect during the survey will not be released outside of the survey groups listed above unless there is an issue of safety. Your consent to allow us to use and share your name and contact information with the groups above will expire five years after the end of the survey.

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

Yimam Getabeh

Address: Ethiopian Public Health Institute, PO Box 1242, Addis Ababa, Ethiopia.  
Office Phone: +251 112788058; Mobile Phone: Tel: +251 912 002053; Fax: 25112758634.  
E-mail: yimamgetaneh@gmail.com

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

Dr. Getachew Addis

Address: EPHI Scientific and Ethics Review Office, P.O Box 1242, Addis Ababa,  
Ethiopia Office Phone: +251-118-685503/15; Mobile Phone: +251 944123110  
E-mail: get\_ast@yahoo.com;

Mr. Yohannes Sitotaw

Address: National Research Ethics Review Committee, P.O Box 2490, Addis Ababa,  
Ethiopia Office Phone: +251011-4-674353; Mobile Phone: +251 913906779  
E-mail: nrerc2015@gmail.com; Fax: +251-011-4-660241

**Do you want to ask me anything about the survey?**

### **Consent Statement**

I have read this form, and someone has read it to me. I was encouraged to ask questions and given time to ask questions. Any questions that I had were answered satisfactorily. I agree for my child to take part in this survey. I know that after allowing my child to take part I may change my mind and withdraw him/her from taking part in this survey at any time. I have been offered a copy of this consent form.

**[For children 12-17]** I agree to allow you to ask my child to be in this survey. I know that after allowing my child to decide whether he/she wants to be in this survey, he/she may withdraw at any time. His/her taking part is voluntary.

**[For children 0-12]** I agree for my child to be in this survey. I know that after allowing my child to be in this survey, I may withdraw him/her at any time. Taking part is voluntary.

**1. [For children 12-17]** Do you agree that we can approach your child to ask that he/she do the interview? 'YES' means that you give your consent to have the survey staff ask your child to take part in the interview, and to participate if the child agrees. 'NO' means that you will NOT give consent for your child to be interviewed.

\_\_\_ Yes \_\_\_ No (If "No" then STOP)

**2. [For children 12-14 years]** Do you agree that we can approach your child to give blood for HIV and related testing? 'YES' means that you give your consent to have the trained survey staff to ask your child to collect a sample of your child's blood for HIV and related testing, and to collect the blood and perform the tests if the child agrees. 'NO' means that your child will NOT give blood for HIV and related testing.

\_\_\_ Yes \_\_\_ No

**3. [For children 15-17 years]** Do you agree that we can approach your child to give blood for Syphilis, and Hepatitis B testing and related testing? 'YES' means that you give your consent to have the trained survey staff to ask your child to collect a sample of your child's blood for Syphilis, and Hepatitis B testing and related testing, and to collect the blood and perform the tests if the child agrees. 'NO' means that your child will NOT give blood for Syphilis, and Hepatitis B testing and related testing.

\_\_\_ Yes \_\_\_ No (If "NO" then STOP)

**4. [For children 0-11 years]** Do you agree for your child give blood for HIV testing and related testing? 'YES' means that you give your consent to have the trained survey staff collect a sample of your child's blood for HIV and related testing. 'NO' means that your child will NOT give blood for HIV testing and related testing.

\_\_\_ Yes \_\_\_ No (If "NO" then STOP)

**5. [For children 12-17 years]** Do you agree to allow us to ask your child to have his/her leftover blood stored for future research? 'YES' means that you give consent for us to ask your child to allow us store leftover blood samples for future research, and to store it if the child agrees. 'NO' means that your child's blood samples will NOT be stored for future research.

\_\_\_ Yes \_\_\_ No

**6. [For children 0-11 years]** Do you agree to have your child's leftover blood stored for future research? 'YES' means that you give consent for your child's leftover blood samples to be stored for future research. 'NO' means that your child's blood samples will NOT be stored for future research.

\_\_\_ Yes \_\_\_ No

**7. [For children 15-17 years]** Do you agree to allow us to ask your child to retain his/her contact information for future research? 'YES' means that you give consent for us to ask your child to allow us to retain his/her contact information for future research, and to retain the information if the child agrees. 'NO' means that your child's contact information will NOT be retained for future research.

\_\_\_ Yes \_\_\_ No

**[Tablet summary statement]**

To confirm, you have agreed to <INSERT ALL OPTIONS MARKED YES: APPROACH CHILD FOR INTERVIEW, APPROACH CHILD FOR BLOOD TESTING, CHILD INTERVIEW, CHILD BLOOD TEST, APPROACH CHILD FOR BLOOD STORAGE, CHILD BLOOD STORAGE, APPROACH CHILD FOR STORAGE CONTACT INFORMATION,

CHILD CONTACT INFORMATION STORAGE>, is this correct? \_\_\_\_ Yes \_\_\_\_ No

Parent/guardian signature or mark \_\_\_\_\_ Date: \_\_/\_\_/\_\_

Printed name of parent/guardian \_\_\_\_\_

**[For illiterate participants]**

Signature of witness \_\_\_\_\_ Date: \_\_/\_\_/\_\_

Printed name of witness \_\_\_\_\_

Signature of person obtaining consent \_\_\_\_\_ Date: \_\_/\_\_/\_\_

Printed name of person obtaining consent \_\_\_\_\_

Survey staff ID number \_\_\_\_\_

Child's name (print) \_\_\_\_\_

Child's participant ID number \_\_\_\_\_

**Assent for Interview from Children ages 12-17**

**Participation duration: 45 min**

**Anticipated number of research participants at this site: 24,846**

**Sponsor/Supporter: PEPFAR Award #1U2GGH001226**

**Principal Investigator:** Prof Sileshi Lulseged; Project Lead, EPHIA/ICAP Ethiopia

**Phone Number:** +2511911228496

**Co-Investigator/Study Coordinator:** Mr. Terefe Gelibo, Project Coordinator, EPHIA/ICAP Ethiopia

**Phone Number:** +251912139705

**Study title: Ethiopia Population-based HIV Impact Assessment (EPHIA)**

**What language do you prefer for our discussion today?**

English

Amharigna

Oromiffa

Tigrigna

Afarigna

Somaligna

Other Language: Specify \_\_\_\_\_

**Interviewer reads:**

Hello. My name is \_\_\_\_\_. We are doing a research study throughout Ethiopia to learn more about HIV in the country. We have talked to your parents/guardian and they said it was okay to invite you take part in a research study.

**Purpose of the survey**

This survey will help us learn more about the health of young people in Ethiopia. It will also tell us about young people's risk for getting HIV, Syphilis, and Hepatitis B. We plan to ask about 19,000 people, ages 15-64 years, and 5,000 children, ages 0-14 years, from about 12,000 households to join this survey. A survey is a way to learn new information about something by interviewing and testing many people. If you join, your taking part will help the Ministry of Health (MoH) to make health services better in the country.

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

### What would happen if you join this survey?

If you decide to join the survey, here is what would happen:

- We will ask you questions about your age, what you know about HIV, Syphilis, and Hepatitis B and whether you have experience with behavior that may put you at risk of HIV, Syphilis, and Hepatitis B.
- The interview will take place in private here in your house or an area around your house.
- The interview will take about 45 minutes.
- After we ask you the questions, if you have agreed, we will take some of your blood to test for HIV and to store for future research tests.
- [Children 12-14] We will use a needle to take about 6 milliliters of blood (a little more than a teaspoonful) from your arm into two tubes. If it's not possible to take blood from your arm, then we will try to take a few drops of blood from your finger. Then we will test your blood for HIV here in your home.
- [Children 15-17] We will use a needle to take about 14 milliliters of blood (less than a tablespoonful) from your arm into two tubes. If it's not possible to take blood from your arm, then we will try to take a few drops of blood from your finger. Then we will test your blood for HIV here in your home.
- It will take about 45 minutes to do the test and to talk to you about the results.
- If you have HIV, we will measure how well your body can fight HIV and other infections. We can do this test here in your home. We will also measure this in the blood of some people without HIV. This is known as a CD4 test.
- If you test positive for HIV, we will also offer you Hepatitis B and Syphilis tests. Like HIV, Hepatitis B and Syphilis are infections that can make someone very sick if left untreated. If you test positive for HIV, we will send your blood to the National Laboratory in Addis Ababa to measure the amount of HIV in your blood. Some of your blood will be sent to a laboratory out of the country for some additional tests related to HIV because there are no laboratories in Ethiopia that can do these tests.
- You may be eligible to take part in future studies related to health in Ethiopia. We are asking for your permission to contact you in the next five years if such an opportunity occurs. To do this, approved researchers will be able to request access to your contact information. If we contact you, we will give you details about the new study and ask you to sign a separate assent/consent form at that time. You may decide at that time that you do not want to take part in that study. If you do not wish to be contacted about future studies, it does not affect your taking part in this survey.
- We will ask you if we can store some of your blood for future testing. These tests will help us learn about the health of people in Ethiopia. This sample will be stored for 5-10 years. Your leftover blood will not be used for anything other than these tests. Your blood will not be sold. If you do not agree to future storage and testing of your blood, we will destroy your blood after survey-related testing has finished and you can still receive your test results and conduct the survey interview.

### Could bad things happen if you join this survey?

You may feel uncomfortable answering some of the questions we will ask. You can refuse to answer any question at any time and we will stop.

The needle may hurt when it is put into and taken out of your arm. This pain will go away quickly. Sometimes the needle can leave a bruise on the skin. You might bleed a little or feel a little dizzy afterwards. Rarely, an infection might occur where the needle enters the skin. We may have to try more than one time in order to get the right amount of blood. We will do our best to make it as painless as possible.

Mr. Yohannes Sitotaw

Address: National Research Ethics Review Committee, P.O Box 2490, Addis Ababa,

Ethiopia Office Phone: +251011-4-674353; Mobile Phone: +251 913906779

E-mail: nrerc2015@gmail.com; Fax: +251-011-4-660241

**Do you want to ask me anything about the survey?**

**Assent statement**

Any questions that I had were answered satisfactorily. I have been offered a copy of this consent form.

Do you agree to do the interview? 'YES' means that you agree to do the interview. 'NO' means that you will NOT do the interview.

Yes  No (If "No" then STOP)

**[For children 12-14]** Make your initial or mark if you agree to give blood for testing and have your parent/guardian receive your result, 'YES' means that you agree to give blood for testing. 'NO' means that you will NOT give blood for testing.

Yes  No (If "No" then STOP)

**[For children 15-17]** Make your initial or mark if you agree to give blood for testing, 'YES' means that you agree to give blood for testing. 'NO' means that you will NOT give blood for testing.

Yes  No (If "No" then STOP)

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

Yes  No

**[For children 15-17]** Do you agree to be contacted in the future? 'YES' means that you agree to be contacted in the future if a study opportunity arises. 'NO' means that you will NOT be contacted about future studies.

YES  NO

**[Tablet summary statement]**

To confirm, you have agreed to <INSERT ALL OPTIONS MARKED YES: INTERVIEW, BLOOD TESTING AND RESULT TO PARENT (12-14YEARS), BLOOD TESTING AND RESULT TO YOU (15-17 YEARS), CHILD INTERVIEW, FUTURE RESEARCH, BLOOD STORAGE>, is this correct?  Yes  No

Child signature or mark \_\_\_\_\_ Date: \_\_/\_\_/\_\_

Printed name of child \_\_\_\_\_

Printed name of parent/guardian \_\_\_\_\_

Signature of person obtaining consent \_\_\_\_\_ Date: \_\_\_/\_\_\_/\_\_\_

Printed name of person obtaining consent \_\_\_\_\_

Survey staff ID number \_\_\_\_\_

**Consent to Share Contact Information for Active Linkage to Care of PHIA Participants, [15-64 years]**

Participation duration: 45 min

Anticipated number of research participants at this site: 24,846

Sponsor/Supporter: PEPFAR Award #1U2GGH001226

Principal Investigator: Prof Sileshi Lulseged; Project Lead, EPHIA/ICAP Ethiopia

Phone Number: +2511911228496

Co-Investigator/Study Coordinator: Mr. Terefe Gelibo, Project Coordinator, EPHIA/ICAP Ethiopia

Phone Number: +251912139705

**Study title: Ethiopia Population-based HIV Impact Assessment (EPHIA)**

**Consent to Share Contact Information of EPHIA Participants with Ministry of Health or their Partner Organizations (Ages 15-64).**

**Purpose of consent**

You had a positive HIV test today. We have provided you with a referral form to bring to a health clinic and seek HIV treatment and care. We would like to help you in accessing the health care that you need. If you agree, we may be able to provide your contact information and HIV test results to health workers or counselors from the Ministry of Health (MoH) or to a partner that the MoH works with. This counselor will contact you to talk to you about HIV and help you go for HIV care. Anyone who is provided with your details will be experienced in providing support to people living with HIV and will be trained in maintaining confidentiality.

**What do you have to do if you agree to take part?**

If you agree for your information to be shared and to be contacted, we will provide your name, phone number (if you provided it to us) and your address to those counselors to provide you with support. The counselor can contact you by a text message sent to your phone, phone call, or in person.

**What about confidentiality?**

Your HIV test results and your contact information will not be shared with any other parties aside from what was specified in the other consent forms, and with this support organization. Maximum effort will be made to maintain your confidentiality.

**What are the potential risks?**

As with all surveys, there is a chance that confidentiality could be compromised. We are doing everything we can to

minimize this risk.

### What are the potential benefits?

A trained health worker or counselor will assist you in accessing the health care that you need.

### Who should you contact if you have questions?

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

Yimam Getaneh

Address: Ethiopian Public Health Institute, PO Box 1242, Addis Ababa, Ethiopia.  
Office Phone: +251 112788058; Mobile Phone: Tel: +251 912002053; Fax: 25112758634.  
E-mail: yimamgetaneh@gmail.com

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

Dr. Getachew Addis

Address: EPHI Scientific and Ethics Review Office, P.O Box 1242, Addis Ababa,  
Ethiopia Office Phone: +251-118-685503/15; Mobile Phone: +251 944123110  
E-mail: get\_ast@yahoo.com;

Mr. Yohannes Sitotaw

Address: National Research Ethics Review Committee, P.O Box 2490, Addis Ababa,  
Ethiopia Office Phone: +251011-4-674353; Mobile Phone: +251 913906779  
E-mail: nrerc2015@gmail.com; Fax: +251-011-4-660241

### Do you want to ask me anything about the survey?

#### Consent Statement

Any questions that I had were answered satisfactorily. I have been offered a copy of this consent form.

1. Do you agree to allow us to share your contact information with the MoH or a partner that the MoH works with, who may contact you to assist and support you in seeking HIV care? 'YES' means that you agree for your information to be shared. 'NO' means that you do not agree for your information to be shared.

\_\_\_\_ Yes \_\_\_\_ No (If "No" then STOP)

2. If yes, do you agree to be contacted by? **[MUST SELECT AT LEAST ONE]**

Text message sent to your phone \_\_\_\_ Yes \_\_\_\_ No

Phone call \_\_\_\_ Yes \_\_\_\_ No

In person \_\_\_\_ Yes \_\_\_\_ No

Participant signature or mark \_\_\_\_\_ Date: \_\_/\_\_/\_\_

Printed name of participant \_\_\_\_\_

Participant ID number \_\_\_\_\_

Signature of person obtaining consent \_\_\_\_\_ Date: \_\_/\_\_/\_\_

Printed name of person obtaining consent \_\_\_\_\_

Survey staff ID number \_\_\_\_\_

**Consent from Parent or Guardian to Share Contact Information for Active Linkage to Care of PHIA Participants, [Age 0-14]** Participation duration: 45 min  
Anticipated number of research participants at this site: 24,846  
Sponsor/Supporter: PEPFAR Award #1U2GGH001226

**Principal Investigator:** Prof Sileshi Lulseged; Project Lead, EPHIA/ICAP Ethiopia  
**Phone Number:** +2511911228496  
**Co-Investigator/Study Coordinator:** Mr. Terefe Gelibo, Project Coordinator, EPHIA/ICAP Ethiopia  
**Phone Number:** +251912139705

**Study title: Ethiopia Population-based HIV Impact Assessment (EPHIA)**

**Consent to from Parent or Guardian to Share Contact Information of EPHIA Participants [aged 0-14] with Ministry of Health or their Partner Organizations.**

#### **Purpose of consent**

Your child/teenager had a positive HIV test today. We have provided you with a referral form to bring him/her to a health clinic and seek HIV treatment and care. We would like to help you in accessing the health care that your child needs. If you agree, we may be able to provide your contact information and HIV test results to health workers or counselors from the Ministry of Health (MoH) or to a partner that the MoH work with. This counselor will contact you and your child to talk to you about HIV and help you go for HIV care. Anyone who is provided with your details will be experienced in providing support to people living with HIV and will be trained in maintaining confidentiality.

#### **What do you have to do if you agree to take part?**

If you agree for your child's information to be shared and to be contacted, we will provide you and your child's name, phone number (if you provided it to us) and address to those counselors to provide you and your child with support. The counselor can contact you by text message sent to your phone, phone call, or in person.

#### **What about confidentiality?**

Your child's HIV test results and your contact information will not be shared with any other parties aside from what was specified in the other consent forms, and with this support organization. Maximum effort will be made to maintain your confidentiality.

**What are the potential risks?**

As with all surveys, there is a chance that confidentiality could be compromised. We are doing everything we can to minimize this risk.

**What are the potential benefits?**

A trained health worker or counselor will assist your child in accessing the health care that he/she needs.

If your child is less than 18 months, they will need to have another test as soon as possible. You need to take your child to a health facility as soon as possible and you should not wait for the result from us, or for someone else to contact you.

**Who should you contact if you have questions?**

If you want your child to leave the study, have any questions about the survey, or feel that you or your child have been harmed by taking part, you should contact:

Yimam Getaneh

Address: Ethiopian Public Health Institute, PO Box 1242, Addis Ababa, Ethiopia.

Office Phone: +251 112788058;

Mobile Phone: Tel: +251 912 002053;

Fax: 25112758634.

E-mail: yimamgetaneh@gmail.com

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

Dr. Getachew Addis

Address: EPHI Scientific and Ethics Review Office, P.O Box 1242, Addis Ababa,

Ethiopia Office Phone: +251-118-685503/15;

Mobile Phone: +251 944123110

E-mail: get\_ast@yahoo.com;

Mr. Yohannes Sitotaw

Address: National Research Ethics Review Committee, P.O Box 2490, Addis Ababa,

Ethiopia Office Phone: +251011-4-674353;

Mobile Phone: +251 913906779

E-mail: nrerc2015@gmail.com;

Fax: +251-011-4-660241

**Do you want to ask me anything about the survey?**

**Consent Statement**

Any questions that I had were answered satisfactorily. I have been offered a copy of this consent form.

1. Do you agree to allow us to share your contact information with the MoH or a partner that MoH works with, who may contact you and your child to assist and support your child in seeking HIV care? 'YES' means that you agree for your information to be shared. 'NO' means that you do not agree for your information to be shared.

\_\_\_\_ Yes \_\_\_\_ No (If "No" then STOP)

2. If yes, do you agree to be contacted by? [MUST PICK ONE]

Text message sent to your phone \_\_\_\_ Yes \_\_\_\_ No Phone call \_\_\_\_ Yes \_\_\_\_ No

In person \_\_\_\_ Yes \_\_\_\_ No

Parent/guardian signature or mark \_\_\_\_\_ Date: \_\_/\_\_/\_\_

Printed name of parent/guardian \_\_\_\_\_

Participant ID number \_\_\_\_\_

Signature of person obtaining consent \_\_\_\_\_ Date: \_\_/\_\_/\_\_

Printed name of person obtaining consent \_\_\_\_\_

Survey staff ID number \_\_\_\_\_

Table 13.3.A Sex before the age of 15 years (continued)

Percentage of male and female young people aged 15–24 years who have had sexual intercourse before the age of 15 years; by sex and selected demographic characteristics, EPHIA 2017-18

Characteristic	Male		Female		Total	
	Percentage who had sex before age of 15 years	Number	Percentage who had sex before age of 15 years	Number	Percentage who had sex before age of 15 years	Number
<b>Religion</b>						
Ethiopian Orthodox	1.7	1,527	3.0	2,650	2.4	4,177
Muslim	1.9	635	3.9	1,185	3.0	1,820
Roman Catholic	*	13	(4.1)	26	(2.5)	39
Protestant	3.3	650	3.6	1,005	3.4	1,655
Other	(3.0)	34	*	22	2.2	56
<b>Ethnicity</b>						
Oromo	3.0	762	3.4	1,319	3.2	2,081
Amhara	0.9	916	3.3	1,674	2.2	2,590
Tigre	1.0	213	1.7	427	1.4	640
Afari	(4.4)	46	12.0	59	7.7	105
Somali	0.0	134	1.8	231	0.9	365
Welaita	6.0	104	4.5	160	5.3	264
Other	2.5	682	3.5	1,014	3.0	1,696
<b>Employment status (last 12 months)</b>						
Employed	2.5	944	4.9	1,246	3.6	2,190
Not employed	2.0	1,914	2.7	3,636	2.4	5,550
<b>Age</b>						
15-19	2.1	1,516	2.1	2,484	2.1	4,000
20-24	2.2	1,345	4.5	2,406	3.3	3,751
Total 15-24	2.2	2,861	3.3	4,890	2.7	7,751

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

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

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

Ethiopia Population-based HIV Impact Assessment  
EPHIA 2017-2018

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Ethiopian Public Health Institute  
P.O. Box-1242  
Addis Ababa  
Ethiopia