Research Square

Preprints are preliminary reports that have not undergone peer review. They should not be considered conclusive, used to inform clinical practice, or referenced by the media as validated information.

Prevalence and Factors Associated with Family-Based HIV Index Case Testing in Wolaita Zone, Southern Ethiopia, 2023: A Cross-Sectional Study

Asrat Bosha

asratbosha12@gmail.com

Saint Paul's Hospital Millennium Medical College

Fatimetu Mohammed

Saint Paul's Hospital Millennium Medical College

Tewodros Eshete

Saint Paul's Hospital Millennium Medical College

Research Article

Keywords: HIV/AIDS, index case testing, family-based testing, Ethiopia

Posted Date: April 19th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-9321469/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License. Read Full License

Additional Declarations: No competing interests reported.

Abstract

Background: Family-based HIV index case testing identifies family members with unknown HIV status and links them to care. Data are limited in southern Ethiopia.

Methods: A facility-based cross-sectional study was conducted among 377 adults on antiretroviral therapy (ART) in Wolaita Zone, Southern Ethiopia, from November 2022 to May 2023. Participants were selected using systematic random sampling. Data were collected via interviewer-administered semi-structured questionnaire. Multivariable logistic regression identified factors associated with index case family testing. Adjusted odds ratios (AOR) with 95% confidence intervals (CI) were calculated, and statistical significance was declared at $p < 0.05$.

Results: The proportion of index case family testing for HIV was 84.9% (95% CI: 81.2–88.6). In multivariable analysis, urban residence (AOR = 2.8; 95% CI: 1.16–6.75), duration on ART greater than 12 months (AOR = 13.0; 95% CI: 4.6–36.9), disclosure of HIV status to family members (AOR = 5.6; 95% CI: 1.9–16.5), discussion of HIV status with family members (AOR = 6.6; 95% CI: 1.9–23.2), and being counselled by health professionals to bring families for testing (AOR = 6.3; 95% CI: 2.1–19.0) were significantly associated with index case family testing.

Conclusion: The prevalence of family-based HIV index case testing in Wolaita Zone was 84.9% (95% CI: 81.2–88.6), which is below the national 95% target. Health professionals should strengthen counselling on ART adherence, status disclosure, family discussion, and active referral, as these factors were significantly associated with higher testing uptake among family members of people living with HIV.

INTRODUCTION

The human immunodeficiency virus (HIV) continues to be a major global public health concern. In 2021, an estimated 38.4 million people were living with HIV worldwide, with approximately 650,000 AIDS-related deaths and 4,000 new infections daily [1]. The Joint United Nations Programme on HIV/AIDS (UNAIDS) established the 95-95-95 targets aiming to diagnose 95% of all HIV-positive individuals, provide antiretroviral therapy (ART) to 95% of those diagnosed, and achieve viral suppression in 95% of those treated by 2030 [2]. However, an estimated 40% of people living with HIV (PLHIV) remain undiagnosed globally [3].

HIV testing and counselling is a critical gateway to ART access, which reduces morbidity, mortality, and HIV transmission through viral suppression [4]. While traditional facility-based testing approaches such as voluntary counselling and testing (VCT) and provider-initiated testing and counselling (PITC) have been widely implemented, alternative

strategies are needed to reach undiagnosed populations. Index case testing—where a person with confirmed HIV infection is asked to contact family members, including children, spouses, sexual partners, siblings, and parents for HIV testing—has demonstrated higher positivity rates compared to other testing methods [5,6].

The World Health Organization recommends targeted HIV testing strategies such as index-linked testing to improve efficiency and reduce costs [7]. Index testing has proven effective in several sub-Saharan African countries, including Ethiopia, for identifying and enrolling previously undiagnosed individuals into ART [8,9]. The Ethiopian government has implemented index testing as part of its national HIV strategic plan [10].

Despite these efforts, evidence from sub-Saharan Africa, including Ethiopia, indicates that only 32–55% of adolescents are ever tested for HIV, and delayed diagnosis increases both further HIV transmission and mortality risk [11,12]. Barriers to testing include stigma, discrimination, and lack of confidential testing environments [13]. A recent population-based survey in Ethiopia found that only 40% of women had been previously tested, suggesting a substantial proportion of HIV-seropositive individuals remain unaware of their status [14].

Previous studies have identified age, residence, education, wealth, condom use, healthcare access, HIV knowledge, and substance use as factors affecting HIV testing. However, these factors vary across populations, countries, and regions [15,16]. Up to 70% of partners and family members of PLHIV are also HIV-positive, yet many remain untested [17]. Without targeted identification and testing of priority populations—including sexual partners and children of PLHIV—achieving the goal of ending HIV/AIDS by 2030 will be difficult [18].

Although index case family testing is a key strategy to identify those at highest risk, information regarding its prevalence and associated factors is limited in Ethiopia. No previous study has been conducted on family-based HIV index case testing in the Southern Nations, Nationalities, and People's Region (SNNPR) or specifically in Wolaita Zone, one of the most populous zones in southern Ethiopia. This study addresses that gap by providing evidence-based information for policymakers, health planners, and decision-makers to improve HIV case management, reduce morbidity and mortality, and enhance service delivery.

General objective: To assess the prevalence and factors associated with family-based HIV index case testing utilization in Wolaita Zone, SNNPR, Ethiopia, 2023.

Specific objectives:

1. To assess the prevalence of HIV index case family testing in selected healthcare facilities in Wolaita Zone.
2. To identify factors associated with family-based HIV index case testing utilization in Wolaita Zone.

METHODS

Study design and setting

A facility-based cross-sectional study was conducted in Wolaita Zone, Southern Nations, Nationalities, and People's Region (SNNPR), Ethiopia. Wolaita Zone is bordered by Gamo Zone to the south, Omo River to the west, Kambata Tambaro to the northwest, Hadiya to the north, Oromia region to the northeast, Sidama region to the east, and Lake Abaya to the southeast. The administrative center is Soddo town. The zone has 63 health centers, 11 primary hospitals, 5 private hospitals, and 1 comprehensive specialized teaching hospital. The study was conducted at four selected health facilities: Wolaita Soddo University Comprehensive and Specialized Hospital, Dubbo Hospital, Soddo Health Center, and Boditi Health Center.

Study period

Data collection was conducted from November 2022 to May 30, 2023.

Source and study population

The source population comprised all people living with HIV (PLHIV) in Wolaita Zone who were currently receiving antiretroviral therapy (ART). The study population included all PLHIV on ART who were eligible for partner and family-based index case HIV testing services at the selected health facilities during the study period.

Inclusion and exclusion criteria

All PLHIV on ART who were eligible for partner and family-based index case testing (i.e., those with a sexual partner or children under 15 years of age) were included. Clients who were seriously ill or physically unable to participate in an interview during the data collection period were excluded.

Sample size and sampling procedure

The sample size was calculated using the single population proportion formula with the following assumptions: 95% confidence level ($Z\alpha/2 = 1.96$), assumed proportion of eligible clients who tested their families ($P = 0.49$) from a previous study [19], 5% margin of error, and a total population of 3,138. The calculated sample size was 384. Since the total

population was less than 10,000, a finite population correction was applied, yielding 343 participants. Adding 10% for non-response gave a final sample size of 377.

A systematic random sampling technique was used. The sampling interval (k) was calculated as 3,138/377 ≈ 8. The first participant was selected by lottery, and every 8th eligible client was subsequently enrolled. The sample was proportionally allocated across the four health facilities based on their average monthly ART patient volume. A detailed schematic representation of the sampling procedure is provided in Supplementary Figure S1.

Data collection instruments and procedures

Data were collected using a pretested, interviewer-administered semi-structured questionnaire adapted from previous studies [19,20]. The questionnaire was developed in English, translated into Amharic, and back-translated to English to ensure consistency. It captured socio-demographic characteristics, health status, family-related factors (disclosure, discussion, partner and child testing), and health facility-related factors (counselling, trust, accessibility). The conceptual framework guiding the selection of variables is presented in Supplementary Figure S2.

Four data collectors and two supervisors were trained for one day on study objectives, ethical principles, interviewing techniques, and data collection instruments. The principal investigator supervised data collection daily. Completed questionnaires were reviewed for completeness and consistency.

Study variables

The dependent variable was index case family testing for HIV (yes/no), defined as either a sexual partner or biological children under 15 years having ever been tested for HIV. Independent variables included socio-demographic factors (age, sex, residence, marital status, education, occupation, income), health status factors (duration on ART, CD4 count, WHO clinical stage), family-related factors (HIV status disclosure, discussion with family members), and health facility-related factors (counselling by health workers, trust in staff, accessibility).

Operational definitions

- **Eligible clients:** PLHIV who had a sexual partner or children under 15 years, or both.
- **Index case:** An individual newly diagnosed as HIV-positive or already enrolled in HIV treatment services [21].
- **Families tested:** Either partner or children under 15 years tested for HIV.
- **Children:** Individuals aged less than 15 years.

- **Sexual partner:** Any person with whom the index client had sexual contact at least once.

Data analysis

Data were entered into Epi-info version 7.2 and exported to SPSS version 26.0 for analysis. Descriptive statistics (frequencies, percentages, means, standard deviations) were computed. Bivariable logistic regression was performed to identify candidate variables ($p < 0.25$) for inclusion in the multivariable model. Multivariable binary logistic regression using backward stepwise elimination was then conducted to identify factors independently associated with index case family testing. Adjusted odds ratios (AOR) with 95% confidence intervals (CI) were reported, and statistical significance was set at $p < 0.05$. Model fit was assessed using the Hosmer-Lemeshow goodness-of-fit test ($p > 0.05$ indicating good fit). Multicollinearity was checked using variance inflation factor (VIF < 5) and tolerance (> 0.1).

Ethical considerations

All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments. Ethical approval was obtained from the Institutional Review Board of Saint Paul's Hospital Millennium Medical College (Reference number: SPHMMC/IRB/2022/123). Written informed consent was obtained from all individual participants included in the study after explaining the study purpose, procedures, risks, and benefits. Confidentiality was ensured by omitting personal identifiers. Participants were informed of their right to withdraw at any time without consequence.

RESULTS

Socio-demographic and health status of participants

All 377 participants completed the study (response rate 100%). Mean age was 36.6 years (SD = 9.97; range 18–75). Females comprised 52.5% (n = 198). The majority resided in urban areas (73.7%, n = 278), were married (71.1%, n = 268), and had secondary education (41.6%, n = 157). Most participants (91.2%, n = 344) had been on ART for ≥12 months (Table 1).

Table 1. Socio-demographic and health status of index HIV cases, Wolaita Zone, SNNPR, Ethiopia, 2023 (N = 377)

Variable	Category	Frequency	Percent
Sex	Male	179	47.5
	Female	198	52.5
Age in years	18–29	114	30.2
	30–39	118	31.3
	40–49	110	29.2
	≥50	35	9.3
Residence	Urban	278	73.7
	Rural	99	26.3
Marital status	Married	268	71.1
	Not married but has partner	34	9.0
	Separated	26	6.9
	Divorced	17	4.5
	Widowed	32	8.5
Education	Illiterate	52	13.8
	Primary	90	23.9
	Secondary	157	41.6
	Diploma or above	78	20.7
Occupation	Student	26	6.9
	Employed	42	11.1
	Merchant	74	19.6
	Farmer	26	6.9
	Daily labor	119	31.6
	Other	90	23.9
Duration on ART	<12 months	33	8.8
	≥12 months	344	91.2

Family-related characteristics

Of 377 participants, 290 (76.9%) had disclosed their HIV status to family members, primarily to sexual partners (80.6%) and own children (51.7%). Additionally, 249 (66.0%)

had discussed HIV testing with family members (Table 2).

Among 315 participants with sexual partners, 276 (87.6%) had partners who tested for HIV, of whom 154 (55.8%) were HIV-positive. Among 227 participants with children under 15 years, 213 (93.8%) had tested their children, with 48 (22.5%) having at least one child test positive (Table 2).

Table 2. Family-related characteristics of index HIV cases, Wolaita Zone, SNNPR, Ethiopia, 2023 (N = 377)

Variable	Category	Frequency	Percent
HIV status disclosed to family	Yes	290	76.9
	No	87	23.1
To whom disclosed (n = 290)	Sexual partner	234	80.6
	Own children	150	51.7
	Siblings	31	10.6
	Parents	27	9.3
Discussed HIV testing with family	Yes	249	66.0
	No	128	34.0
Has sexual partner	Yes	315	83.6
	No	62	16.4
Partner tested for HIV (n = 315)	Yes	276	87.6
	No	19	6.0
	Don't know	20	6.4
Partner HIV result (n = 276)	Positive	154	55.8
	Negative	122	44.2
Has children <15 years	Yes	227	60.2
	No	150	39.8
Children tested for HIV (n = 227)	Yes	213	93.8
	No	14	6.2

Health facility-related characteristics

Most participants (96.0%) had HIV testing facilities near their residence. The majority preferred health worker referral (55.4%), health facility-based testing (93.4%), and regular work hours (87.8%). Most (92.0%) were counselled by health workers to bring families for testing, and 91.8% trusted health workers to maintain confidentiality (Table 3).

Table 3. Health facility-related characteristics of index HIV cases, Wolaita Zone, SNNPR, Ethiopia, 2023 (N = 377)

Variable	Category	Frequency	Percent
HIV testing facility nearby	Yes	362	96.0
	No	15	4.0
Preferred referral means	Client referral	57	15.1
	Health worker referral	209	55.4
	Dual referral	113	30.0
	Contractual referral	9	2.4
Preferred testing place	Health facility-based	352	93.4
	Home-based	9	2.4
	Community-based	16	4.2
Counselled by health workers	Yes	347	92.0
	No	30	8.0
Trust health workers for confidentiality	Yes	346	91.8
	No	31	8.2

Proportion of index case family testing

Of 377 participants, 320 (84.9%; 95% CI: 81.2–88.6) had tested their family members for HIV (Figure 1).

Factors associated with index case family testing

In bivariable analysis, residence, marital status, duration since HIV diagnosis, duration on ART, CD4 count, media exposure, HIV status disclosure, discussion with family, availability of testing facilities, trust in health workers, and counselling by health workers were candidates for multivariable analysis ($p < 0.25$).

In multivariable analysis, five factors remained significantly associated with index case family testing (Table 4):

1. Urban residence: AOR = 2.8 (95% CI: 1.16–6.75)
2. ART duration ≥12 months: AOR = 13.0 (95% CI: 4.6–36.9)
3. HIV status disclosure: AOR = 5.6 (95% CI: 1.9–16.5)
4. Discussion with family: AOR = 6.6 (95% CI: 1.9–23.2)
5. Counselling by health workers: AOR = 6.3 (95% CI: 2.1–19.0)

The Hosmer-Lemeshow test indicated good model fit (χ^2 = 3.15, df = 8, p = 0.67). No multicollinearity was detected (VIF < 5 for all variables).

Table 4. Bivariable and multivariable analysis of factors associated with index case family testing, Wolaita Zone, SNNPR, Ethiopia, 2023 (N = 377)

Variable	Category	Family tested		COR (95% CI)	AOR (95% CI)	p-value
		Yes (n=320)	No (n=57)			
Residence	Urban	240	38	1.5 (0.8–2.7)	**2.8 (1.16–6.75)**	0.023
	Rural	80	19	1	1	
Duration on ART	≥12 months	311	33	25.0 (10.7–58.5)	**13.1 (4.6–36.9)**	<0.001
	<12 months	9	24	1	1	
HIV status disclosed	Yes	278	12	24.8 (12.1–50.7)	**5.6 (1.9–16.5)**	0.002
	No	42	45	1	1	
Discussed HIV status with family	Yes	243	6	26.8 (11.0–64.9)	**6.6 (1.8–23.2)**	0.004
	No	77	51	1	1	
Counselled by health workers	Yes	304	43	6.1 (2.8–13.5)	**6.3 (2.1–19.0)**	0.001
	No	16	14	1	1	

Abbreviations: AOR, adjusted odds ratio; COR, crude odds ratio; CI, confidence interval. Bold values indicate statistical significance at $p < 0.05$. Model fit: Hosmer-Lemeshow χ^2 = 3.15, df = 8, p = 0.67.

DISCUSSION

This study assessed the prevalence and factors associated with family-based HIV index case testing among adults on ART in Wolaita Zone, Southern Ethiopia. The proportion of index case family testing was 84.9% (95% CI: 81.2–88.6). Urban residence, duration on ART greater than 12 months, disclosure of HIV status to family members, discussion of HIV status with family members, and being counselled by health professionals to bring families for testing were significantly associated with index case family testing.

Prevalence of index case family testing

The proportion of index case family testing (84.9%; 95% CI: 81.2–88.6) is higher than reports from Kule Refugee Camp, Southwest Ethiopia (49%) [19], Felege Hiwot Referral Hospital, Bahir Dar (74.2%) [22], Uganda (72%) [23], and Kenya (62%) [24]. However, it is lower than findings from Woliso Town, Oromia, Ethiopia (94%) [20] and Tanzania (96.0%) [25]. This variation may be explained by differences in sampling methods, study populations, healthcare settings, and participant characteristics [19]. Notably, the 84.9% prevalence falls short of Ethiopia's national 95% target for index case testing modalities [26], indicating room for improvement.

Urban versus rural residence

Urban residents were nearly three times more likely to have tested their family members than rural residents (AOR = 2.8; 95% CI: 1.16–6.75). This finding aligns with a study in eastern Ethiopia, where urban residence was associated with 34 times higher odds of HIV testing [27]. Similarly, a multi-country study across 29 sub-Saharan African countries found consistently higher HIV testing uptake in urban areas [28]. Possible explanations include better accessibility of VCT centers, greater availability of health facilities, higher literacy rates, and reduced stigma in urban settings.

Disclosure of HIV status

Index clients who disclosed their HIV status to family members were 5.6 times more likely to have their families tested (AOR = 5.6; 95% CI: 1.9–16.5). This is consistent with studies from Woliso, Ethiopia (AOR = 7.2) [20], Uganda [29], and Zambia [30]. Disclosure likely facilitates open communication about HIV, reduces fear and stigma, and enables family members to make informed decisions about testing. Conversely, non-disclosure—often

driven by fear of stigma, rejection, or intimate partner violence—remains a major barrier [31].

Discussion about HIV testing with family members

Participants who discussed HIV testing with their families were 6.6 times more likely to test their families (AOR = 6.6; 95% CI: 1.9–23.2). Similar associations were reported in Mekelle Hospital, Ethiopia [32], and Nairobi, Kenya [33]. Discussion creates a supportive environment, normalizes testing, and directly prompts action.

Duration on antiretroviral therapy

Clients on ART for more than 12 months were 13 times more likely to test their families than those on ART for less than 12 months (AOR = 13.0; 95% CI: 4.6–36.9). This finding mirrors studies from Côte d'Ivoire [34], Kenya, and Uganda [35]. Newly initiated clients often experience higher levels of self-perceived stigma, fear of discrimination, and psychological distress. Over time, as clients adjust to their diagnosis, adhere to treatment, and build trust with healthcare providers, they become more willing to disclose and refer family members for testing [36].

Counselling by health professionals

Participants counselled by health workers to bring their families for testing were 6.3 times more likely to test their families (AOR = 6.3; 95% CI: 2.1–19.0). Similar results were reported in Tanzania [37]. Effective counselling provides comprehensive information about the importance of tracing and testing sexual partners, children, and other family members. Counsellors can help PLHIV overcome fear, choose preferred referral methods, and develop practical plans for family testing [36].

Reasons for non-testing and non-disclosure

Among participants who did not test their families, the major reasons for non-disclosure to partners included fear of perceived self-stigma (75.3%), fear of divorce or separation (24.6%), and fear of intimate partner violence (11.1%). Among those who did not disclose to children, the main reasons were not wanting to worry their children (49.3%) and believing children would not understand (32.4%). These findings highlight the need for targeted counselling interventions.

Limitations

This study has several limitations. First, the cross-sectional design precludes causal inference. Second, data on family member testing were based on participant self-report, which may introduce social desirability and recall bias. Third, the study was conducted in

only four health facilities, limiting generalizability to other settings. Fourth, HIV testing status of family members was based on participant self-report and was not independently verified, which may introduce social desirability and recall bias. Despite these limitations, this is the first study to examine family-based index case testing in Wolaita Zone and provides important baseline data for the region.

CONCLUSION

The proportion of family-based HIV index case testing in Wolaita Zone was 84.9% (95% CI: 81.2–88.6), below the national 95% target. Urban residence, longer ART duration (≥12 months), HIV status disclosure to family members, discussion of HIV status with family members, and counselling by health professionals were significantly associated with testing uptake. Fear of self-stigma, divorce, and intimate partner violence were major barriers to disclosure and testing.

Recommendations:

- Health facilities should strengthen counselling programs that address fear and stigma, particularly for newly initiated ART clients, as these factors were associated with higher testing uptake.
- Health workers should actively counsel index cases to disclose their status, discuss testing with family members, and refer families for testing.
- Policymakers should prioritize index case testing services in all governmental and private health facilities, with special attention to rural areas.
- Further qualitative and quantitative studies are needed across different zones and regions to identify additional contextual factors.

Abbreviations

Abbreviation	Meaning
AOR	Adjusted odds ratio
ART	Antiretroviral therapy
CI	Confidence interval
HIV	Human immunodeficiency virus
PLHIV	People living with HIV
SNNPR	Southern Nations, Nationalities, and People's Region
SPSS	Statistical Package for the Social Sciences
VCT	Voluntary counselling and testing
WHO	World Health Organization

Declarations

Ethics approval and consent to participate: All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments. Ethical approval was obtained from the Institutional Review Board of Saint Paul's Hospital Millennium Medical College (Reference number: SPHMMC/IRB/2022/123). Written informed consent was obtained from all individual participants included in the study.

Consent for publication: Not applicable (no individual person's data).

Availability of data and materials: The datasets used and analyzed during this study are available from the corresponding author upon reasonable request.

Competing interests: The authors declare no competing interests.

Funding: This study was self-funded by the author. No external funding was received.

Authors' contributions: ABK conceived the study, designed the methodology, collected data, analyzed data, and drafted the manuscript. FM and TE supervised the study, reviewed the analysis, and critically revised the manuscript. All authors read and approved the final manuscript.

Clinical trial number: not applicable.

Acknowledgements: The authors thank Saint Paul's Hospital Millennium Medical College, the Southern Public Health Institute, Wolaita Zone Health Department, and the selected

health facilities for their cooperation. We are also grateful to the data collectors, supervisors, and all study participants.

References

1. UNAIDS. Global HIV Statistics. Fact Sheet 2021. Geneva: UNAIDS; 2021. p. 1-3.
2. Heath K, Levi J, Hill A. The Joint United Nations Programme on HIV/AIDS 95-95-95 targets: worldwide clinical and cost benefits of generic manufacture. AIDS. 2021;35(Suppl 2):S197-203.
3. Jubilee M, Park FJ, Chipango K, Pule K, Machinda A, Tarubebereka N. HIV index testing to improve HIV positivity rate and linkage to care and treatment of sexual partners, adolescents and children of PLHIV in Lesotho. PLoS One. 2019;14(3):1-12.
4. Belato DT, Mekiso AB, Begashaw B. Male partners involvement in prevention of mother-to-child transmission of HIV services in Southern Central Ethiopia: In case of Lemo District, Hadiya Zone. AIDS Res Treat. 2017;2017:1-7.
5. Kamanga J, Stankevitz K, Martinez A, Chiegil R, Nyirenda L, Mulenga F, et al. Improved HIV case finding among key populations after differentiated data driven community testing approaches in Zambia. PLoS One. 2021;16(12):1-13.
6. Khongonyowa L, Schouten E, Auld A. Malawi District Health System Strengthening and Quality Improvement for Service Delivery. Strategy for Achieving HIV. Msh. 2018;I(June):1-2.
7. Johnson C. Consolidated Guidelines on HIV Testing Services: 5Cs: Consent, Confidentiality, Counselling, Correct Results and Connection. Geneva: World Health Organization; 2015. p. 163.
8. Jerene D, Abebe W. HIV Testing Services HIV Self-Testing and Partner. Addis Ababa: Ministry of Health Ethiopia; 2017. p. 7.
9. Lewis Kulzer J, Penner JA, Marima R, Oyaro P, Oyanga AO, Shade SB, et al. Family model of HIV care and treatment: A retrospective study in Kenya. J Int AIDS Soc. 2012;15(1):8.
10. Federal Democratic Republic of Ethiopia Ministry of Health. National Quality Improvement Strategy. Addis Ababa: FMOH; 2018.
11. Ahmed S, Sabelli RA, Simon K, Rosenberg NE, Kavuta E, Harawa M, et al. Index case finding facilitates identification and linkage to care of children and young persons living with HIV/AIDS in Malawi. Trop Med Int Health. 2017;22(8):1021-9.
12. Lowenthal E, Bakeera-Kitaka S, Marukutira T, Chapman J, Goldrath K, Ferrand RA. Perinatally acquired HIV infection in adolescents from sub-Saharan Africa: a review of emerging challenges. Lancet Infect Dis. 2014;14(7):627-39.

13. Harichund C, Moshabela M. Acceptability of HIV Self-Testing in Sub-Saharan Africa: Scoping Study. AIDS Behav. 2018;22(2):560-8.
14. Central Statistical Agency Ethiopia. Ethiopia Demographic and Health Survey 2016. Addis Ababa: CSA; 2016.
15. Musheke M, Ntalasha H, Gari S, Mckenzie O, Bond V, Martin-Hilber A, et al. A systematic review of qualitative findings on factors enabling and deterring uptake of HIV testing in Sub-Saharan Africa. BMC Public Health. 2013;13:220.
16. Exner T, Kelvin E, Ramjee G. Socio-demographic Factors Associated with Uptake of HIV Counseling and Testing (HCT) among Nigerian Youth. J AIDS Clin Res. 2014;5(10):1-2.
17. Wegu Y, Sileshi T, Melis T. Assessment of Index Case Family Testing Among Adults Attending Art Clinic at Kule Refugee Camp, Southwest Ethiopia: 2021. HIV/AIDS - Res Palliat Care. 2022;14:13-21.
18. World Health Organization Regional Office for Africa. End HIV/AIDS by 2030. Brazzaville: WHO AFRO; 2014.
19. Wegu Y, Sileshi T, Melis T. Assessment of Index Case Family Testing Among Adults Attending Art Clinic at Kule Refugee Camp, Southwest Ethiopia: 2021. HIV/AIDS - Res Palliat Care. 2022;14:13-21.
20. Haile T, Gulema H. Assessment of the proportion and the factors associated with partner and family based index case HIV testing in Woloso town, Oromia, Ethiopia: a cross-sectional study. 2020:1-21.
21. WHO, PEPFAR, CDC. Partner and Family-Based Index Case Testing. Geneva: World Health Organization; 2015. p. 42.
22. Gebresillassie BM, Emiru YK, Erku DA, Mersha AG, Mekuria AB, Ayele AA, et al. Utilization of Provider-Initiated HIV Testing and Counseling as an Intervention for PMTCT Services Among Pregnant Women Attending Antenatal Clinic in a Teaching Hospital in Ethiopia. Front Public Health. 2019;7:1-6.
23. Were WA, Mermin JH, Wamai N, Awor AC, Bechange S, Moss S, et al. Undiagnosed HIV infection and couple HIV discordance among household members of HIV-infected people receiving antiretroviral therapy in Uganda. J Acquir Immune Defic Syndr. 2006;43(1):91-5.
24. Wagner AD, Mugo C, Njuguna IN, Maleche-Obimbo E, Sherr K, Inwani IW, et al. Implementation and operational research: Active referral of children of HIV-positive adults reveals high prevalence of undiagnosed HIV. J Acquir Immune Defic Syndr. 2016;73(5):e83-9.
25. Sanga Z, Kapanda G, Msuya S, Mwangi R. Factors influencing the uptake of Voluntary HIV Counseling and Testing among secondary school students in Arusha City, Tanzania: A cross sectional study. BMC Public Health. 2015;15(1):1-9.

26. Federal HIV/AIDS Prevention and Control Office. HIV/AIDS National Strategic Plan for Ethiopia 2021-2025. Addis Ababa: FHAPCO; 2021.
27. Tesfaye G, Dessie Y, Berhane Y, Assefa N, Semahegn A, Canavan CR, et al. HIV/AIDS awareness and testing practices among adolescents in eastern Ethiopia. Trop Med Int Health. 2020;25(1):111-8.
28. Staveteig S, Wang S, Head SK, Bradley SEK, Nybro E. Demographic patterns of HIV testing uptake in sub-Saharan Africa. DHS Comparative Reports No. 30. Calverton: ICF International; 2013. p. 81.
29. Nabunya P, Byansi W, Sensoy Bahar O, McKay M, Ssewamala FM, Damulira C. Factors Associated With HIV Disclosure and HIV-Related Stigma Among Adolescents Living With HIV in Southwestern Uganda. Front Psychiatry. 2020;11:1-10.
30. Aluisio AR, Bosire R, Bourke B, Gatuguta A, Kiarie JN, Nduati R, et al. Male partner participation in antenatal clinic services is associated with improved HIV-free survival among infants in Nairobi, Kenya: A prospective cohort study. J Acquir Immune Defic Syndr. 2016;73(2):169-76.
31. Turan JM, Bukusi EA, Onono M, Holzerner WL, Miller S, Cohen CR. HIV/AIDS stigma and refusal of HIV testing among pregnant women in rural Kenya: Results from the MAMAS study. AIDS Behav. 2011;15(6):1111-20.
32. Alemayehu M. The Role of Male Partner Involvement on Mother's Adherence to PMTCT Care and Support, Tigray, Northern Ethiopia. Fam Med Med Sci Res. 2014;3(4):4-10.
33. Aluisio AR, Bosire R, Bourke B, Gatuguta A, Kiarie JN, Nduati R, et al. Male partner participation in antenatal clinic services is associated with improved HIV-free survival among infants in Nairobi, Kenya: A prospective cohort study. J Acquir Immune Defic Syndr. 2016;73(2):169-76.
34. Doumatey NIL, Ekra AK, Ebah LG, Kouame H. Outcome of HIV Testing Among Family Members of Index Cases Across 36 Facilities in Abidjan, Cote d'Ivoire. AIDS Behav. 2021;25(2):554-61.
35. Penfold S, Simms V, Downing J, Powell RA, Mwangi-Powell F, Namasango E, et al. The HIV basic care package: where is it available and who receives it? Findings from a mixed methods evaluation in Kenya and Uganda. AIDS Care. 2014;26(9):1155-63.
36. Edosa M, Merdassa E, Turi E. Acceptance of Index Case HIV Testing and Its Associated Factors Among HIV/AIDS Clients on ART Follow-Up in West Ethiopia: A Multi-Centered Facility-Based Cross-Sectional Study. HIV/AIDS - Res Palliat Care. 2022;14:451-60.
37. Gitige CG, Kweisigabo GP, Panga OD, Samizi FG, Abade AM, Mbelele PM, et al. Factors associated with Partners Elicitation during HIV Index client's testing in Dar es Salaam Region, Tanzania. J Interv Epidemiol Public Health. 2021;4(3).

Figures

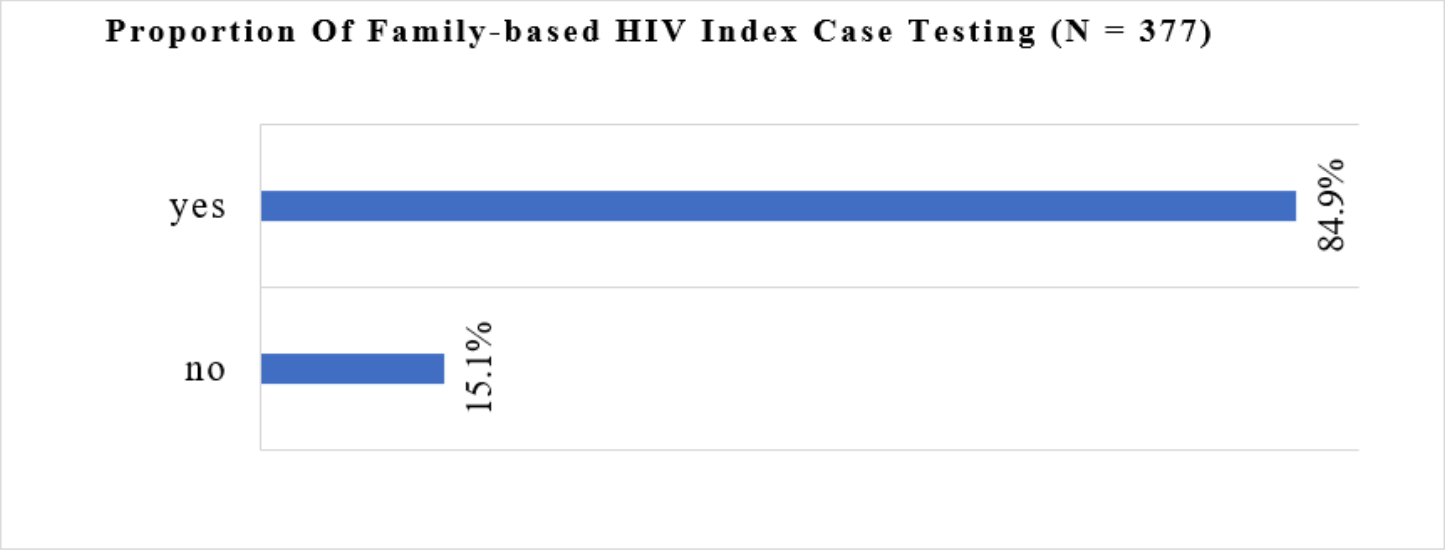


Figure 1

Proportion of family-based HIV index case testing among adults on antiretroviral therapy (ART) in Wolaita Zone, Southern Ethiopia, 2023 (N = 377)

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- AsratBoshaSupplementaryquestionnaire.docx
- AsratBoshaSupplementaryFile1.pdf
- AsratBoshaSupplementaryFile2.pdf
- SFig3.pdf