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# Acceptance of Index Case HIV Testing and Associated Factors Among ART Patients in ART Sites in Gedeo Zone, Southern Ethiopia, 2025

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## Abstract

Globally, HIV continues to be one of the biggest public health concerns, affecting nearly 38 million people, of whom over 16% are unaware of their status. More than two-thirds of people living with HIV are found in the Sub-Saharan Africa. Index cases HIV testing is a good approach for addressing and improving the efficiency and yield of testing among high-risk populations. Partners and families of people living with HIV are among the high-risk populations for contracting HIV. However, there is a limited study on index-case HIV testing among ART patients attending ART sites. The objective of this study was o assess the acceptance of index case HIV testing and associated factors among ART patients in ART sites in Gedeo zone, Southern Ethiopia, 2024/5. A facility-based cross-sectional study was conducted from 10 December, 2024 to 15 January, 2025 among ART patients in ART sites in Gedeo zone. Data were collected using a structured questionnaire and observational checklist. A simple random sampling technique was used to select four public health facilities. The study participants were chosen through systematic random sampling. Exit interviews were conducted by trained data collectors. Data were entered into EPI Data 3.1 and analyzed using SPSS version 26. Bivariable and multivariable logistic regressions were used to analyze the data. The magnitude of the acceptance of the index case testing among ART patients was 198 (65.6%), (95% CI, 65.12- 66.07). The acceptance of index case testing was significantly associated with several factors: residence (AOR=2.80; 95% CI: 1.62 - 4.83), disclosure of HIV status (AOR=3.27; 95% CI: 1.79-5.96), and possessing good knowledge (AOR=1.85; 95% CI: 1.02-3.37).

## Keywords

Index Case Testing, HIV Testing and Counseling, Associated Factors

## 1. Introduction

Human immune deficiency virus (HIV) remains a major public health concern worldwide. In 2021, 38.4 million people worldwide are estimated to be living with HIV, but only 28.7 million have access to antiretroviral therapy (ART). A total of 5.9 million people were unaware of their HIV status, and over 16% did not know at all. Most people living with HIV live in sub-Saharan Africa [1, 2]. Nearly half of HIV infected patients enrolled in ART had untested family members [3]. The adult HIV prevalence rate in Ethiopia is 1.5%, and there are an estimated 759,338 people living with HIV in

the country [4].

The index case HIV testing (ICHT) strategy involves a confirmed HIV-infected person contacting family members or partners on their own initiative or being assisted by HIV testing providers [3, 5, 6]. It has increased uptake of HIV test services and identified partners with an undiagnosed infection. This approach is a key intervention in diagnosing PLWHIV, and enrolling and sustaining them in treatment and care [7]. Knowing one's sero-status through an index case HIV testing is an important step to adopting safer sexual behaviour which enables PLWHIV to protect their partners from acquiring HIV, promote safer sexual practices and encourage disclosure to sexual partners [8]. Moreover, it is an important prevention strategy to increase the impact of treatment, improves adherence and brings behavior change. Prevention of new HIV infection is essential in order to avert future care and treatment costs [9].

The treatment of those who are already ill and prevention of new infections is essential to the prevention and control of HIV infection [10]. Notable advancements have been achieved in the endeavor to combat the HIV epidemic, striving to attain the global UNAIDS objectives of 95% of people living with HIV (PLWHIV) being aware of their HIV status, 95% of PLWHIV receiving Antiretroviral Therapy (ART), and 95% of those on ART experiencing viral suppression by the year 2030 [11]. Ethiopia has implemented a case-based surveillance system that includes index case HIV testing and has recognized HIV as one of the diseases that must be reported right away [12]. Additionally, improving disclosure and testing service uptake among index partners and HIV-exposed children requires addressing clients' concerns, according to the consolidated comprehensive HIV prevention, care, and treatment national guidelines [3]. The study findings may help in developing better strategic approaches to increasing the number of HIV index case testing service.

# 2. Objectives of the Study

## 2.1. General Objective

To assess the acceptance of ICHT and associated factors among ART patients in ART sites in Gedeo zone, Southern Ethiopia, 2024/5.

## 2.2. Specific Objectives

(1) To assess the magnitude of acceptance of ICHT among ART patients in ART sites in Gedeo zone, Southern Ethiopia, 2024/5.
(2) To identify factors associated with acceptance of ICHT among ART patients in ART sites in Gedeo zone, Southern Ethiopia, 2024/5.

# 3. Methodology

## 3.1. Study Area and Period

The study was conducted in Gedeo zone, which is located in Southern Ethiopia regional state at a distance of 359km from the capital Addis Ababa. It has six woreda and two city administrations with a total population of 1.3 million inhabitants. There are 8 public health facilities with ART sites such as Dilla referral hospital, Yirga Chefe primary hospital, Gedeb primary hospital, Bulle primary hospital, Dilla health center, Wenago health center, Chelelekitu health center and Yirga Chefe health center. According to the Gedeo zone health bureau 2023 report there are 4,490 PLWHIV currently on ART program. The data collection was undertaken in the period from 10 December, 2024 to 15 January, 2025.

## 3.2. Study Design

A facility-based cross-sectional study.

## 3.3. Source and Study Population

1) Source Population: - All PLHIV follow ART in public health facilities in Gedeo zone.
2) Study Population: - All randomly selected HIV positive individuals 18 years or above and follow ART in public health facilities in Gedeo zone.

## 3.4. Eligibility Criteria

1) Inclusion criteria: - PLHIVs whose ages 18 years or above and living together with other household members follow ART in public health facilities in Gedeo zone.
2) Exclusion criteria: - Index case with mental illness and severe medical illness that were unable to respond was excluded.

## 3.5. Operational Definitions

1) Index case: People diagnosed with HIV positive, aware of their status, and enrolled in HIV care and treatment [13].
2) Index case testing: It is a voluntary process where health care workers ask index case to list all of their sexual partners/family members and offering HCT [13].
3) Acceptance: When an index case welcome testing of their sexual partners and family members and when consent of the index client obtained [13].
4) Knowledge: Knowledge status of study participants on ICHT computed when they score above 50% of the questions on knowledge considered as good knowledge [8].

## 3.6. Sample Size Determination

Sample size was calculated based on the rate of acceptance of ICHT that is 85.2% from study conducted in Nekemte Town, West Ethiopia [13]. By assuming 85.2% acceptance of ICHT 95% confidence interval, 5% margin of error and adding 15% non-response rate to the calculated sample size.

$$n = \frac{Z\alpha/2^2 P(1-P)}{d^2} = \frac{(1.96)^2 0.85(0.15)}{(0.05)^2} = 196$$

Finally, 15% was added for compensating possible non response rate and we get 226. In order to check whether the above sample size is sufficient to assess the factors, sample size of the second specific objective was also calculated separately.

*Table 1. Sample size calculation for the second specific objective using Epi-info 7.*

| Assumption | Disclosure status | Benefit of ICHT | Duration of ART |
|---|---|---|---|
| CI | 95% | 95% | 95% |
| Power | 80 | 80 | 80 |
| Ratio (Unexposed: Exposed) | 0.18 | 0.085 | 0.185 |
| % Outcome in unexposed | 46.6 | 53.3 | 66.6 |
| OR | 13.66 | 6.07 | 3.9 |
| Sample size | 266 | 188 | 215 |
| S/size with 15% NR rate | 306 | 217 | 248 |
| Reference | [13] | [13] | [13] |

Since the sample size calculated for the second specific objective (306) is larger than sample size calculated for the first objective. So, sample size calculated for second specific objective was used.

## 3.7. Sampling Technique and Procedures

By using simple random sampling method, we selected 4 public health facilities (Dilla referral hospital, Gedeb primary hospital, Wenago health center and Bulle health center), and sample size was proportionally allocated to each health facility based on the number of clients on ART follow-up at each site. The selected health facilities currently about 2,925 PLHIV (Dilla referral hospital 1974, Gedeb primary hospital 383, Wenago health center 412 and Bulle health center 156) on ART follow up. A systematic random sampling procedure was used to select eligible index case from each ART unit, and every "kth" index case was selected.

## 3.8. Data Collection and Quality Control

The data were collected by using the structured, interviewer-administered questionnaires and by reviewing medical record to collect necessary data. The questionnaire was first prepared in English, and translated into Amharic then, translated back into English, to check the consistency. Four data collectors and one supervisor were participated in the data collection process and monitoring. They received one day's training before data collection. The collected data were reviewed and checked for completeness and consistency of the response by the supervisor on a daily basis.

The data collection tool was pre-tested on 5% of the sample in Yirga chafe primary hospital and Dilla health center one week prior to data collection. Depending on the result of pretest, correction and modification were done on questionnaires before applying on the study population. For data collectors and supervisor one-day training was provided on the study's purpose, questionnaire details, data handling and maintaining respondent confidentiality. Relevant experts were reviewing the questionnaire to ensure it aligns with the study objective.

## 3.9. Data Analysis and Process

The completed data were entered, cleaned and coded into a computer using EPI-data 3.1 and exported to the SPSS version 26 windows programs for additional analysis. Bivariable logistic regression analysis was used to identify candidate variables for multivariable logistic regression at P-value of ≤0.25. The strength of association was determined using multivariable logistic regression at p-value <0.05 and AOR 95% CI of Assumptions of logistic regression were checked before the final multivariable analysis. The final multivariable model goodness of fit was checked using the Hosmer-and Lemeshow and chi-square tests.

## 3.10. Ethical Consideration

Ethical clearance was obtained from Institutional Research Ethical Review Committee (IRERC) of Pharma college school of graduate studies. The permission letters were taken from Gedeo zone health bureau. A formal letter was written to each health facility from Gedeo Zone Health Bureau. Verbal informed consent was obtained from each study participant to confirm willingness for participating after explaining the objective of the study. To keep the privacy, each of the respondents was interviewed separately in a quiet room prepared for this purpose. The respondents were assured that neither the data collectors nor the supervisors would have access to their responses.

## 4. Result

### 4.1. Socio-demographic Characteristics

The final analysis was thus based on data obtained from 302 (98.7%) of the study participants. The mean age was 34.85 years (SD ± 7.4). More than half respondents 171 (56.6%) were urban residents, and 120 (39.7%) attend primary education. The majority of respondents 181 (59.9%) of them were married, and currently live with their partner. Half of respondents 151 (50%) had a family monthly income of greater than 4500 Ethiopian birr (ETB).

*Table 2. Socio-demographic characteristics of participants in Gedeo zone, Ethiopia, 2024/5.*

| Variables | Frequency (n) | Percentage (%) |
|---|---|---|
| Sex (N=302) | | |
| Male | 109 | 36.1 |
| Female | 193 | 63.9 |
| Age in years (N=302) | | |
| 18-24 | 16 | 5.3 |
| 25-34 | 153 | 50.7 |
| ≥35 | 133 | 44.0 |
| Residence (N=302) | | |
| Rural | 131 | 43.4 |
| Urban | 171 | 56.6 |
| Marital Status (N=302) | | |
| Single | 48 | 15.9 |
| Married | 181 | 59.9 |
| Divorced | 37 | 12.3 |
| Widowed | 36 | 11.9 |
| Educational Status (N=302) | | |
| No formal education | 34 | 11.3 |
| Primary | 120 | 39.7 |
| Secondary | 101 | 33.4 |
| College and above | 47 | 15.6 |
| Family income in ETB (N=302) | | |
| ≤1500 | 52 | 17.2 |
| 1501-3000 | 50 | 16.6 |
| 3001-4500 | 49 | 16.2 |
| >4500 | 151 | 51.0 |
| Religion (N=302) | | |

| Variables | Frequency (n) | Percentage (%) |
|---|---|---|
| Protestant | 202 | 66.9 |
| Orthodox | 73 | 24.2 |
| Muslim | 20 | 6.6 |
| Other | 7 | 2.3 |
| Currently live (N=302) | | |
| Alone | 43 | 14.2 |
| Partner | 181 | 59.9 |
| Children | 72 | 23.8 |
| Other | 6 | 2.0 |
| Current marriage type (181) | | |
| Polygamous | 14 | 7.7 |
| Monogamous | 167 | 92.3 |
| Educational status of your spouse/partner | | |
| No formal | 26 | 8.6 |
| Primary | 112 | 37.1 |
| Secondary | 121 | 40.1 |
| Diploma and above | 43 | 14.2 |

### 4.2. Lifestyle and Behavioral Characteristics

About 18 (6%) of study participants had a history of cigarettes smoking. Nearly one-fifth 59 (19.5%) of study participants had a history of drinking alcohol. About 177 (58.6%) of the respondents never used a condom in a lifetime. About 51 (16.9%) study participants responded that they have no regular partner, among 39 (76.5%) of them discussed about condom use with non-regular Partner.

*Table 3. Lifestyle and behavioral characteristics of participants at Gedeo zone, Ethiopia, 2024/5.*

| Variables | Frequency (n) | Percentage (%) |
|---|---|---|
| History of cigarette smoking (N=302) | | |
| Yes | 18 | 6 |
| No | 284 | 96 |
| Alcohol drinking (N=302) | | |
| Yes | 59 | 19.5 |
| No | 243 | 80.5 |
| Substance use (N=302) | | |
| Yes | 31 | 10.3 |
| No | 271 | 89.7 |

| Variables | Frequency (n) | Percentage (%) |
|---|---|---|
| Kind of sexual partner (N=302) | | |
| Regular partner | 251 | 83.1 |
| Non Regular partner | 51 | 16.9 |
| Discussed about condom use with non RP? (N=51) | | |
| Yes | 39 | 76.5 |
| No | 12 | 23.5 |
| Have you ever used condom? (N=302) | | |
| Yes | 125 | 41.4 |
| No | 177 | 58.6 |

## 4.3. Knowledge, Attitude and Practice Related to HIV/AIDS

All respondents heard about ICHT service. Majority 243 (80.5%) gets information about ICHT service from health care workers. Overall about 207 (68.5%) has good knowledge on Index case HIV testing.

*Table 4. KAP related characteristics of participants at Gedeo zone, Ethiopia, 2024/5.*

| Variables | Frequency (n) | Percentage (%) |
|---|---|---|
| ICHT is important to partners and family of PLHIVs? (N=302) | | |
| No | 31 | 10.3 |
| Yes | 271 | 89.7 |
| Where did you get information about ICHT service provision? (N=302) | | |
| Health workers | 243 | 80.5 |
| Mass media | 36 | 11.9 |
| Friends | 23 | 7.6 |
| How important is index case HIV testing to partners/Family of PLHIVs? (N=302) | | |
| Very important | 94 | 31.1 |
| Important | 99 | 32.8 |
| Somewhat important | 78 | 25.8 |
| Not important | 31 | 10.3 |
| What are perceived benefit of ICHT) (N=271) | | |
| To know serostatus | 63 | 23.2 |
| To bring to care and support | 14 | 5.2 |

| Variables | Frequency (n) | Percentage (%) |
|---|---|---|
| To protect from getting HIV | 25 | 9.2 |
| All | 271 | 62.4 |
| Healthy-looking person can be infected with HIV? (N=302) | | |
| No | 113 | 37.4 |
| Yes | 189 | 62.6 |
| Can HIV be prevented? (N=302) | | |
| No | 23 | 7.6 |
| Yes | 279 | 92.4 |
| Can a person with HIV be cured? (N=302) | | |
| No | 286 | 94.7 |
| Yes | 16 | 5.3 |
| How can a person realize if he/she has HIV? (N=302) | | |
| Simply by looking | 63 | 20.9 |
| Getting tested for HIV | 239 | 79.1 |
| How you can protect partner and family? (N=302) | | |
| Avoiding sex | 30 | 9.9 |
| Be faithful | 48 | 15.9 |
| Using condom consistently | 26 | 8.6 |
| All | 198 | 65.6 |
| Do you think partner/family have HIV negative test result? (N=302) | | |
| No | 48 | 15.9 |
| Yes | 254 | 84.1 |
| Any support available in health facilities for partners with different results? | | |
| Yes | 28 | 9.3 |
| No | 274 | 90.7 |
| Knowledge level (N=302) | | |
| Poor | 95 | 31.5 |
| Good | 207 | 68.5 |

## 4.4. HIV Status Disclosure Related Factors

About 213 (70.5%) index clients had disclosed their HIV serostatus. Common reason for not discloses HIV status was fear of Social stigma/discrimination 70 (78.7%). More than half 161 (53.3%) had initiated their partner or family for HTC.

*Table 5. Disclosure status related characteristics at Gedeo zone, Ethiopia, 2024/5.*

| Variables | Frequency (N) | Percentage (%) |
|---|---|---|
| Disclosure status (N=302) | | |
| Not disclosed | 89 | 29.5 |
| Disclosed | 213 | 70.5 |
| Disclosed to whom? (N=213) | | |
| Family | 107 | 50.2 |
| Partner | 32 | 15.0 |
| Friends | 39 | 18.3 |
| All | 36 | 16.4 |
| Benefit of disclosure to partner/family members (N=213) | | |
| Prevent transmission | 41 | 19.2 |
| To know serostatus | 20 | 9.4 |
| Avoid stress | 53 | 24.9 |
| All | 99 | 46.5 |
| Reason for not disclosed (N=89) | | |
| Stigma/discrimination | 70 | 78.7 |
| Fear of divorce/separation | 19 | 21.3 |
| Have you ever initiated your current partner or family for HTC? (N=302) | | |
| Yes | 161 | 53.3 |
| No | 141 | 46.7 |
| Reason to initiation of HTC to current partner or other family? (N=161) | | |
| Prevent HIV | 98 | 60.9 |
| To know status | 55 | 34.0 |
| Requested by partner/family members | 8 | 5 |
| How frequently your partner or family members get testing for HIV? (N=161) | | |
| Every 3 months | 38 | 23.6 |
| Every 6 months | 53 | 32.9 |
| Every year | 38 | 23.6 |
| Other | 32 | 19.9 |

## 4.5. Sexual and Reproductive Health Related Characteristics

Majority 218 (72.2%) had less than Ten years age difference with recent partners. About 20 (11%) previous history of marriage or partnership with someone, about 14 (7.7%) had polygamous type of marriage. About 48 (15.9%) had no history of child birth. About 59 (19.5%) had history of the non-regular sexual partner.

*Table 6. Sexual and Behavioral characteristics in Gedeo zone, Ethiopia, 2024/5.*

| Variables | Frequency (N) | Percentage (%) |
|---|---|---|
| Age difference with recent partner (N=302) | | |
| Ten or more years | 84 | 27.8 |
| Less than ten years | 218 | 72.2 |
| Is this your first marriage or partnership? (N=181) | | |
| Yes | 161 | 89 |
| No | 20 | 11 |
| How do you describe the type of your current marriage? (N=181) | | |
| Polygamous | 14 | 7.7 |
| Monogamous | 167 | 92.3 |
| How many children do you have? (N=302) | | |
| Zero | 48 | 15.9 |
| One and above | 254 | 84.1 |
| Do you have other sexual partner other than regular? (N=302) | | |
| No | 243 | 80.5 |
| Yes | 59 | 19.5 |
| Counselled on HIV index case testing (N=302) | | |
| No | 20 | 6.6 |
| Yes | 282 | 93.4 |

## 4.6. Clinical Related Characteristics

The recent mean CD4 count of the participants was 359 copies/mm$^3$ (SD±92.7). About 241 (79.8%) of the respondents diagnosed HIV before two years, and 233 (77.2%) of the respondents had more than two-year ART follow up duration. Majority 244 (80.8%) was category under of stage 1 and 282 (93.4%) had good drug adherence. Among 302 study participants, 198 (65.6%) accepted index case HIV testing with (95% CI, 65.12- 66.07).

*Table 7. Clinical related characteristics of participants at Gedeo zone, Ethiopia, 2024/5.*

| Variables | Frequency (n) | Percentage (%) |
|---|---|---|
| Diagnosed HIV (N=302) | | |
| 1-24 months | 16 | 5.3 |
| 25-48 months | 45 | 14.9 |

| Variables | Frequency (n) | Percentage (%) |
|---|---|---|
| >48 Months | 241 | 79.8 |
| ART Follow up duration (N=302) | | |
| 1-24 months | 18 | 6.0 |
| 25-48 months | 51 | 16.9 |
| >48 Months | 233 | 77.2 |
| Recent CD4 count (N=302) | | |
| <200 | 47 | 15.6 |
| ≥200 | 255 | 84.4 |
| Clinical stage (N=302) | | |
| Stage 1 | 244 | 80.8 |
| Stage 2 | 35 | 11.6 |
| Stage 3 | 19 | 6.3 |
| Stage 4 | 4 | 1.3 |
| Drug adherence (N=302) | | |
| Good | 282 | 93.4 |
| Poor | 20 | 6.6 |
| Do you trust health workers keep the information confidential? (N=302) | | |
| No | 21 | 7.0 |

| Variables | Frequency (n) | Percentage (%) |
|---|---|---|
| Yes | 281 | 93.0 |
| Would you be willing to take your partner/family for HTC to the nearby facility? | | |
| Yes | 198 | 65.6 |
| No | 104 | 34.4 |
| Reason for not accept index case HIV testing (N=104) | | |
| Stigma/discrimination | 53 | 51.0 |
| Fear of divorce/separation | 51 | 49.0 |

## 4.7. Factors Associated with Acceptance of ICHT

In Bivariable logistic analysis variables such as Residence, Knowledge level, Disclosure status and Duration of ART were variables significantly associated with dependent variables. After controlling the effect of other confounding factors on multivariable analysis, Residence (AOR= 2.80 95% CI: 1.62 - 4.83), Knowledge level (AOR: 1.85; 95% CI, 1.02-3.37) and Disclosure status (AOR: 3.27; 95% CI, 1.79-5.96) were found to be significantly associated acceptance of ICHT.

*Table 8. LR for factors associated with acceptance of ICHT Gedeo zone, Ethiopia, 2024/5.*

| Variables | Acceptance ICHT | | COR (95%CI) | AOR (95%CI) | P-value |
|---|---|---|---|---|---|
| | Yes | No | | | |
| Residence | | | | | |
| Rural | 68 | 63 | 1 | 1 | |
| Urban | 130 | 41 | 2.94 (1.79-4.79) | 2.80 (1.62-4.83)* | 0.000 |
| Knowledge level | | | | | |
| Poor | 45 | 50 | 1 | 1 | |
| Good | 153 | 54 | 3.15 (1.89-5.23) | 1.85 (1.02-3.37)* | 0.043 |
| Disclosure status | | | | | |
| Not Disclosed | 35 | 54 | 1 | 1 | |
| Disclosed | 163 | 50 | 5.03 (2.96-8.55) | 3.27 (1.79-5.96)* | 0.000 |
| Duration of ART | | | | | |
| 1-24 Months | 8 | 10 | 1 | 1 | |
| 25-48 months | 25 | 26 | 1.02 (0.41-3.54) | 1.00 (0.29-3.34) | 0.999 |
| >48 Months | 16 | 68 | 3.03 (1.15-8.01) | 2.82 (0.95-8.33) | 0.061 |

# 5. Discussion

This study tried to assess the magnitude of acceptance of index case HIV testing and associated factors among adults currently attending ART clinics in Gedeo zone, Southern Ethiopia. This study showed that 198 (65.6%), (95% CI, 65.12- 66.07) respondents accepted index case HIV testing. Findings of this study also revealed that acceptance Index Case HTC was significantly associated with Residence, HIV status disclosure, knowledge level of index case HIV test and duration of the stay on ART.

The level of acceptance of ICHT in this study is relatively lower than a study conducted in Tanzania 96.1% [14], Zimbabwe 95% [15], West Ethiopia 85.2% [13]. The acceptance of ICHT in this study is relatively higher than a study conducted in Kenya 62% [16], Lesotho 37.3% [17], Southwest Ethiopia 49.% [18], Northwest Ethiopia 39.21% [19], Southern Ethiopia 60.6% [20]. Possible explanations for this variation may be sociodemographic and sexual behaviour differences among the study population. This study showed that main reason for not accepting ICHT was fear of social stigma and discrimination 53 (51%) and Fear of divorce/separation 51 (49%), which is consistent with a study done in Ethiopia [21-23].

This study shows that index case HIV testing has a significant association with Residence of study participants. This study demonstrated that the odds of index case HIV testing were found to be higher among study participants who are urban residents as compared to those who are rural residents. It showed that respondents who are urban residents were two times more likely to accept HIV testing when compared to the index cases who are rural residents. The finding is consistent with a study done in Ethiopia [24, 25].

The study found that having good knowledge regarding ICHT is associated with acceptance of ICHT. The finding of this study shows that those who have good knowledge on ICHT were 2 times more likely to accept ICHT when compared to those who had poor ICHT knowledge. Similarly, a study conducted in China on HTC utilization shows that higher levels of HIV-related knowledge were significantly associated with greater willingness to utilize HTC service [26]. Also, the finding is consistent with a study conducted in addis ababa Ethiopia [8], West Ethiopia [13] and Adama Ethiopia [27].

Additionally, this study shows that index case HIV testing has a significant association with HIV status disclosure of respondents. This study shows that the odds of accepting index case HIV testing were found three times higher odds among those who disclosed HIV status than not disclosed HIV status. This finding was consistent with a study in Addis Ababa Ethiopia [8], Southern Ethiopia [20], West Ethiopia [13], Southwest Ethiopia [18], Northwest Ethiopia [28] and Oromia Ethiopia [29].

# 6. Conclusion

The findings of this study suggest that acceptance of ICHT among PLWHIV on ART is low. This study shows that Residence, HIV status disclosure and knowledge of ICHT were factors significantly associated with the acceptance of ICHT. It is important to increase counseling on the importance of ICHT which enhances PLWHIV to have a positive attitude on the advantages of ICHT, and strengthening disclosure of HIV status. Therefore, strengthening counseling on the importance of ICHT, enhance PLWHIV to have a positive attitude in the advantage of ICHT, and helping them to refer the indexes through the referral method they choose.

# 7. Recommendation

Based on the finding from the study, the following recommendations are made:

(1) Efforts should be strengthened to increase knowledge and bring attitude change to benefits of ICHTC thus to increase disclosure and acceptance of ICHT.

(2) Intervention should prioritize mutual disclosure of HIV status, make clear understanding on benefits of HTC and develop positive attitude to ICHT.

(3) Promotion upon initiation of partners and family to take HTC by index client is important.

# Abbreviations

| AOR | Adjusted Odd Ratio |
|-----|--------------------|
| ART | Anti-retro Viral Therapy |
| COR | Crude Odd Ratio |
| HTC | HIV Counseling and Testing |
| ICHT | Index Case HIV Testing |
| PLWHIV | People Living with Human Immune Deficiency Virus |

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# Data Sharing Statement

The data used to support the findings of this study are available from the corresponding author upon a request.

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# Conflicts of Interest

The authors declare no conflicts of interest.

# References

[1] Mwango LK., Stafford KA., and B. NC., Index and targeted community-based testing to optimize HIV case finding and ART linkage among men in Zambia. J Int AIDS Soc, 2020.

[2] WHO., Guidelines on HIV self-testing and part-ner notification: supplement to consolidated guidelines on HIV testing services. 2021.

[3] Ahmed S., 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, 2021.

[4] Baggaley R., The impact of Voluntary counseling and testing. A global review of the benefits and challenges., 2011.

[5] Joseph D., et al., HIV Positivity and Referral to Treatment Following Testing of Partners and Children of PLHIV Index Patients in Public Sector Facilities in South Africa. J Acquir Immune Defic Syndr., 2019. 81(4): p. 365-70.

[6] WHO., Consolidated guidelines on HIV testing services., WHO, Editor. 2018: Geneva.

[7] Harries AD., Ford N., and Jahn A., Act local, think global: how the Malawi experience of scaling up antiretroviral treatment has informed global policy. BMC Public Health, 2016. 16(1): p. 1-9.

[8] Abraham H., Acceptance of Index case HIV testing and counseling among HIV patients under ossa care and support Outlets and Zewditu Memorial Hospital, Addis Ababa. PLoS One, 2013. 14(3).

[9] Yemane B., e. a., HIV / AIDS in Ethiopia., W. bank, Editor. 2010: Washington DC.

[10] WHO., Gender dimensions of HIV status disclosure to sexual partners: rates, barriers and outcomes. World Health Organization; 2004. Available from: https://apps.who.int/iris/handle/10665/42717 2023.

[11] UNAIDS., Global AIDS Update. Confronting inequalities-lessons for pandemic responses from 40 years of AIDS. 2021.

[12] Mirkuzie AH., et al., Progress towards the 2020 fast track HIV/AIDS reduction targets across ages in Ethiopia as compared to neighboring countries using global burden of diseases 2017 data. BMC Public Health, 2021. 21(1): p. 1-10.

[13] Edosa M, Merdassa M, and T. 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 - Research and Palliative Care,, 2022. 14: p. 451-460.

[14] Kahabuka C., Plotkin M., and C. A., Addressing the first 90: a highly effective partner notification approach reaches previously undiagnosed sexual partners in Tanzania. AIDS Behav., 2017. 21(8): p. 2551-2560.

[15] Mahachi N., Muchedzi A., and T. TA., Sustained high HIV case-finding through index testing and partner notification services: experiences from three provinces in Zimbabwe.

Journal Int AIDS Soc., 2019. 22.

[16] Aluisio AR, Bosire R, and B. B., Male partner participation in antenatal clinic services is associated with improved HIV-free survi val among infants in Nairobi, Kenya: a prospective cohort study. J Acquir Immune Defic Syndr., 2016;. 73(2): p. 169.

[17] Jubilee M, et al., 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).

[18] Wegu Y, Sileshi T, and M. T., Assessment of Index Case Family Testing AmongAdults Attending Art Clinic at Kule Refugee Camp, Southwest Ethiopia:. HIV/AIDS - Research and Palliative Care, 2022. 14 p. 13-21.

[19] Asmare L, Yigzaw ZA, and A. T., Magnitude of HIV Index Case Testing among HIV Positive Clients Attending ART Clinic in University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia, 2023. J AIDS HIV Treat., 2024. 6(1): p. 37-43.

[20] Assefa E. and F. Z., Acceptance of the Index Case HIV Testing and Associated Factors among Anti-Retroviral Therapy Patients in Public Health Facilities in Gedeo Zone, Southern Ethiopia. Cross-Sectional Study Design with Document Review. The Journal of Health Care Organization, 2024. 61: p. 1-9.

[21] Teklehaimanot HD, et al., Factors influencing the uptake of voluntary HIV counseling and testing in rural Ethiopia: a cross sectional study. BMC Public Health, 2016. 16(1): p. 1-13.

[22] Deribe K, et al., Disclosure experience and associated factors among HIV positive men and women clinical service users in southwest Ethiopia. BMC Public Health, 2008. 8(1).

[23] Dessalegn NG, Hailemichael RG, and S.-A. A., HIV Disclosure: HIV-positive status disclosure to sexual partners among individuals receiving HIV care in Addis Ababa, Ethiopia. PLoS One, 2019. 14(2).

[24] Bekele YA and F. GA., Factors associated with HIV testing among young females; further analysis of the 2016 Ethiopian demographic and health survey data. PLoS One., 2020. 15(2).

[25] Abate BB., et al., Residence and young women's comprehensive HIV knowledge in Ethiopia. 2020.

[26] Fu G, Shi Y, and Y. Y., The prevalence of and factors associated with willingness to utilize HTC service among college students in China.. BMC Public Health., 2018. 18(1): p. 1-10.

[27] Gebremedhin KB, et al., Factors associated with acceptance of provider-initiated HIV testing and counseling among pregnant women in Ethiopia..; 12: 183.. Patient Prefer Adherence, 2018. 12: p. 183-191.

[28] Abtew S., Awoke W., and A. A., Acceptability of provider-initiated HIV testing as an intervention for prevention of mother to child transmission of HIV and associated factors among pregnant women attending at Public Health Facilities in Assosa town, Northwest Ethiopia.. BMC Res Notes, 2015. 8(1): p. 1-8.

[29] Seyoum F., et al., Magnitude and factors assoiated with part-ner and family based index case HIV testing among clients on ART follow-up at Holeta Health Center, Oromia, Ethiopia. Africa journal of nursing and midwifery., 2024. 26(1).