

# Utilization of HIV Test Service Among Pregnant Women's Partners and Its Associated Factors in Selected Sub-Cities of Addis Ababa, 2019: A Community-Based Cross-Sectional Study

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**Background:** Significant progress has been made towards achieving the 90-90-90 global targets by 2020. Nationally, 72% of HIV-positive people aged 15–64 years in urban areas were aware of their HIV status. There is low habit of male partner accompanying pregnant women during ANC visit. This study assessed the HIV test service utilization and associated factors among pregnant women's partners in Addis Ababa.

**Methods:** A community-based cross-sectional study design was conducted from January to February 2020 in Addis Ababa town. A multistage sampling method was used to recruit 812 participants. Data were entered into EpiData version 4.1 and analysis was done by using SPSS version 25.0. The presence and strength of significant association with outcome variables in multivariable analysis were determined with  $P < 0.05$  and at 95% CI, respectively.

**Results:** Among respondents, 63.7% [95% CI (60–67%)] of pregnant woman partners had tested for HIV/AIDS. Knowledge on the route of HIV transmission from mother to child (AOR=1.9, 95% CI (1.3–2.7)), knowledge on ways of prevention of HIV from mother to child transmission (AOR=0.26, 95% CI (0.17–0.38)), previous history of couple HIV counseling (AOR=3.7, 95% CI (2.3–6.1)), discussion about HCT and ANC services with a partner (AOR=6.3, 95% CI (4.0–9.8)), heard about discordant HIV test result (AOR=1.6, 95% CI (1.4–4)) were significantly associated with partner HIV test.

**Conclusion:** HIV testing service utilization among male partners of pregnant women was good in the study area. The knowledge on ways of prevention of HIV from mother to child transmission, those who received couple HIV counseling before, those who discussed HCT at ANC services with a partner, and heard about discordant HIV test results were predictors of HIV test utilization among pregnant women partner. Therefore, increasing community awareness on the pregnant women partner testing should be planned to enhance male partner HIV testing during in antenatal care follow-up.

**Keywords:** HIV, partner HIV test, pregnant woman

## Introduction

Human immune deficiency (HIV) is a sexually transmitted infection (STI) that can also be spread by contact with infected blood or from mother to child during pregnancy, childbirth, or breast-feeding.<sup>1</sup> If HIV is left untreated, a person's immune system will get weaker and weaker until it can no longer fight off life-threatening infections and diseases.<sup>2</sup> The HIV testing programs are implemented to

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reach people living with HIV who are unaware of their status, or those at a higher risk of acquiring HIV, and are critical to an effective HIV response. HIV testing goals call for 90% of all people living with HIV to know their status by 2020, as described in the UNAIDS' 90-90-90 Fast-Track Targets.<sup>3</sup>

The World Health Organization recommends offering HIV testing and counseling to couples, wherever HIV testing and counseling are available, including in antenatal clinics to prevent PMTCT. The success in integrating HIV testing into antenatal and other sexual and reproductive health services has seen an increasing number of women testing.<sup>4</sup> One of the ways a male partner get a chance of testing is through the provision of prevention of mother to child transmission (PMTCT) services at antenatal clinics. Couple HIV testing and counseling (CHTC) offers couples the opportunity to test, receive their results, and mutually disclose their status in an environment where support is provided by a counselor/health worker. A range of prevention, treatment, and support options can then be discussed and decided upon together, depending on the status of each partner.<sup>5</sup>

Low uptake of HIV testing services in sub-Saharan Africa (SSA) is among the key barriers to meet the 90-90-90 targets established by UNAIDS and to improve the effectiveness of HIV treatment as prevention. HIV testing among men particularly remains low in many countries, as does the knowledge of HIV status among HIV-infected persons.<sup>6,9,12,19</sup> The national prevalence of HIV infection among those aged 15–49 years went down to 0.9 though there is heterogeneity by sex, geography and population groups – remaining high among women and urban areas in Ethiopia. Similarly, though not uniform significant progress has been made towards achieving the 90–90-90 global targets by 2020 which is evidenced by a recent population-based HIV impact assessment survey where 72% of HIV-positive people aged 15–64 years in urban areas were aware of their HIV status, 99% of those aware of their HIV-positive status reported current use of ART, and 90% of those reporting current use of ART were virally suppressed.<sup>26</sup>

## Significance of the Study

HIV/AIDS is still a priority Public Health problem. Knowing HIV status is essential for prevention, treatment and to get support. Many women, who are living with HIV, are unable to disclose their status due to different reasons. To breakdown, this problem partner HIV counseling and testing

are very essential. Partner HIV testing can also increase the retention in PMTCT services and treatment adherence.

However, numerous reasons for non-participation of male partners in HIV counseling and testing have been gained from studies that primarily focused on women as respondents. Therefore, this study was conducted to assess the level of partner HIV test utilization and associated factors. The study finding will be important to guide public health planners and implementers in planning and designing appropriate intervention strategies to increase partner testing.

## Objectives

- To assess the level of utilization of HIV test service among Pregnant Women's Partners in Selected Sub-Cities of Addis Ababa, 2020.
- To identify the factors associated with the utilization of HIV test service among male partner of pregnant women in Selected Sub-Cities of Addis Ababa, 2020.

## Materials and Methods

### Study Design

A community-based cross-sectional study design was conducted to assess the level of male partner's HIV test service utilization and its associated factors in selected sub-cities of Addis Ababa.

### Study Area and Period

The study was conducted in selected sub-cities of Addis Ababa city administration; the capital city of Ethiopia from January 1 to February 30, 2020. The city has 10 sub-cities and 116 Woredas. There are 5 hospitals owned by the Addis Ababa health bureau, 4 by the Federal Ministry of Health, 1 by Addis Ababa University, 3 by non-governmental Organizations, 3 by the defense force and police, and 34 by private owners. There are 100 public health centers and around 700 private clinics out of which 75 are higher clinics.<sup>24</sup>

### Population

All male partners of pregnant women in Addis Ababa City were the Source population for the current study. All male partners of pregnant women who were living in selected sub-cities were the Study population.

### Inclusion and Exclusion Criteria

All male partners of pregnant women who lived more than 6 months in selected sub-cities of Addis Ababa were

included in the study. All male partners of pregnant women who are unable to speak and hear were excluded.

## Sample Size and Sampling Procedure

The sample size was calculated for both objectives and the maximum sample size was obtained using the first objective. The following assumptions were used for sample size calculations: a proportion of 40.1% of male partner testing in Gondar town,<sup>16</sup> level of significance 5% ( $\alpha = 0.05$ ), 95% confidence level ( $Z_{\alpha/2} = 1.96$ ) and absolute precision or margin of error 5% ( $d = 0.05$ ), power 80%, ratio of exposed to unexposed 1:1, and design effect of 2.

The calculated maximum initial sample size was 369. Therefore, by adding 10% for possible non-response rate, the sample size required for the study was 812.

## Sampling Procedures

A multistage sampling method was used to select study participants. From the total 10 sub-cities, three sub-cities were selected by the lottery method. Then, five woredas from each selected sub-cities were selected randomly. The numbers of participants from each Woreda were determined by proportionate allocation of sample size to number of pregnant women in the Woreda by reviewing the annual expected number of pregnant woman report of 2012 E.C/2019. Systematic random sampling was applied to select households with a pregnant mother and to interview her male partner.

## Study Variables

### Dependent Variable

Male partner HIV test utilization.

### Independent Variables

#### Socio-Demographic Variables

Age, occupation, marital status, time period of living together, educational status, average-monthly income, spouse education.

#### Knowledge Related Variables

Awareness on the availability of HIV test services in ANC, knowledge about HIV transmission, knowledge about the route of MTCT of HIV transmission, knowledge about PMTCT and heard about discordant HIV test result.

#### Family Communication

Communication between partners about ANC and HCT.

## History of HIV Test

Previous couple HIV counseling and testing in current pregnancy.

## Operational Definitions

### Partner HIV Test Utilization

When husbands or partners of pregnant woman have tested for HIV on ANC.<sup>10</sup>

### Knowledge on the Route of HIV Transmission

When respondents know at least two routes of HIV from three routes of transmission.<sup>10</sup>

### Knowledge on the Route of HIV Transmission from Mother to Child

When respondents know at least two routes of HIV transmission from mother to child from three routes of transmission.

### Knowledge About PMTCT

When respondents know at least two ways of PMTCT from three ways of PMTCT.

## Data Collection Tool and Procedure

A structured questionnaire was adapted from the result of different researches done on the partner HIV test. It was prepared in English and translated into Amharic and back to English to keep the consistency of the data. The questionnaire had different sections, socio-demographic information, knowledge about HIV transmission, family communication, and experience of counseling and testing for HIV.

The households home from each selected Woreda were identified from the health extension worker's report. Data were collected by going home to home. Each individual was asked for consent before he was interviewed using the questionnaire. All partners of pregnant women in the study areas were eligible to be included in this study.

## Data Quality Assurance

A brief training was given for data collectors on the objective, relevance, and benefits of the study, confidentiality of information, respondent's right, informed consent, and technique of interview supported with a demonstration on how to conduct the interview and overall data collection process before the actual time of data collection. A pre-test was conducted 5% (41) of the sample size in Yeka sub-city Woreda 06 and some minor modifications

were done accordingly. The collected data were reviewed and checked for completeness and consistency by the principal investigator and supervisor on daily basis at the spot during the data collection time.

## Data Processing and Analysis

Data were coded and entered into EpiData version 4.6 and analyzed using SPSS software version 25. Descriptive analysis was performed to describe the number and percentage of socio-demographic characteristics of the sample and other variables and presented in tables and graphs. Binary logistic regression was conducted. Bivariate analysis was used to analyze the relationship between the dependent and independent variables. All variables with  $P < 0.2$  in bivariate analysis were entered into multivariate analysis to identify factors independently associated with partner HIV test. The significance of odds ratios (OR) was determined with 95% CI and  $P < 0.05$ .

## Ethical Consideration

The ethical approval and clearance was obtained from St. Lideta Medical and Business College. Then, permission and letter of cooperation for the health facilities were obtained from the Addis Ababa Health Bureau. We explained the participants about the purpose of the study, benefits of the study, their right to refuse anytime, and the confidentiality in the language that the participant can understand to comply with the Declaration of Helsinki. An informed voluntary written consent was obtained from each participant before conducting the interview. Any personal identification of the study participants was not recorded during data collection.

## Results

### Socio-Demographic Characteristics of the Respondents

A total of 798 respondents were interviewed with a response rate of 98.2%. The mean age of the study subjects was 37.46 years with a standard deviation of  $\pm 7.1$  years. Among the respondents 397 (49.7%) were 31–40 years of age, most of the respondents 751 (94.1%) were married. Half of the respondents 405 (50.8%) who were married stayed together for 1–5 years and those who lived together 5–10 years were 195 (24.4%). The respondents who were interviewed had a college and above 335 (42%) educational status and 280 (35.1%) of them completed secondary schools. More than half of respondents were working in private 409 (51.3%) and

governmental employment accounts for 247 (31%). The respondent average monthly income in Ethiopian birr obtained were (1100–4999) which was 380 (47.6%). The respondent's wife age from 21 to 30 years were 376 (47.1%). The educational status for a respondent's wife who was college and above 294 (36.8%) and 216 (27.1%) mothers had secondary school education shown in [Table 1](#).

## Knowledge and Awareness About HIV and PMTCT

The proportion of male respondents who know about HIV transmission by sexual intercourse, sharing sharp material, and mother to the child were 93.4%, 87.1%, and 74.4%, respectively. The composite knowledge proportion of HIV transmission was 85.5%. Regarding MTCT, during pregnancy (76.8%), during labor and delivery (68.2%), during breastfeeding (66.7%). Of the participants, 63.9% of them knew about HIV transmission from mother to child. Among the respondents, those who know the method of PMTCT which were antiretroviral therapy during pregnancy was 568 (71.2%), and who knew that provision of ARTs for the newborn could help to reduce MTCT of HIV was 348 (43.6%). The composite knowledge proportion for PMTCT was 38.3% shown in [Table 2](#).

The respondents who knew that there is HIV counseling and testing (HCT) during ANC visits were 85.0%. Those who believed that partner HIV counseling and testing is necessary were 763 (95.6%). A three fourth of the participants 599 (75.1%) had heard HIV test discordant result.

## HIV Tested the Status of Partners of Pregnant Women

In this study, the proportion of partners of pregnant women who had tested was 63.7% (95% CI 0.60–0.67) who had tested for HIV/ADIS came with their wives to ANC and received HIV counseling and testing together. Slightly more than one-fourth 27.2% of the participants decided by own and 18.3% partner invitation from health-care provider to test for HIV shown in [Figure 1](#)

Participants who had received a couple of counseling and testing before were 593 (74.3%). The respondents who ever discussed ANC and HIV tests were 482 (60.4%). Partners who had not tested for HIV/ADIS gave a reason for being busy 16.3% and proxy testing 10.3% as stated in [Figure 2](#).

**Table 1** Socio-Demographic Characteristics of Partner of Pregnant Woman in Addis Ababa, Ethiopia, 2019

Variables	Category	Frequency (n)	Percent
<b>Age (years)</b>	<20	2	0.3
	21–30	143	17.9
	31–40	397	49.7
	41–50	227	28.4
	>51	29	3.6
<b>Marital status</b>	Married	751	94.1
	Unmarried	42	5.3
	Divorced	5	0.6
<b>Duration of marriage (years)</b>	<1	99	12.4
	1–5	405	50.8
	5–10	195	24.4
	>10	52	6.5
<b>Educational status</b>	No formal education	44	5.5
	Primary school (1–8)	139	17.4
	Secondary school (9–12)	280	35.1
	College and above	335	42.0
<b>Occupation</b>	Governmental employee	247	31.0
	Private	409	51.3
	NGO	83	10.4
	Daily labor	59	7.4
<b>Respondent personal average monthly income (Eth.Birr)</b>	<1000	13	1.6
	1100–4999	380	47.6
	5000–9999	347	43.5
	>10,000	58	7.3
<b>Age of women (years)</b>	<20	14	1.8
	21–30	376	47.1
	31–40	368	46.1
	>41	40	5.0
<b>Educational status of women</b>	No formal education	90	11.3
	Primary school (1–8)	198	24.8
	Secondary school (9–12)	216	27.1
	College and above	294	36.8

## Factors Associated with a Partner of Pregnant Woman HIV Test Status

In bivariate analysis respondents who had a college and above educational status were 7.9 times more likely to be tested than primary attended (COR= 7.9, 95% CI (4.0–15.8)). The partner who had been employed in the governmental institution were 7.3 times more likely tested compared to a private organization (COR =7.3, 95% CI (3.9–13.5)). Partners who know the presence of HCT during ANC were more likely tested than their counterparts (COR = 5.3, 95% CI (3.5–8.1)).

In multivariate analysis, knowledge on the route of HIV transmission from mother to child, knowledge on ways of prevention of HIV from mother to child transmission, those who received couple HIV testing before, discussed HCT& ANC services with a partner, heard about discordant HIV test result were significantly associated with partner HIV test.

The respondent who knew the route of HIV transmission from mother to child was 1.9 more likely to test than who had no knowledge (AOR=1.9, 95% CI (1.3–2.7)). Participants who do not know ways of prevention of HIV transmission from mother to child were 74% less likely to be tested for HIV/AIDS than those who know ways of PMTCT (AOR=0.26, 95% CI (0.17–0.38)). Those who received couple HIV counseling and testing before were 3.7 times likely to have partner HIV test than those who do not have received couple HIV counseling and testing (AOR =3.7, 95% CI (2.-3–6.1)). Couples who ever discussed ANC and HCT were 6.3 times likely to have HIV test (AOR= 6.3, 95% CI (4.0–9.8)) compared to their counterparts. Respondents who heard about discordant HIV test results were 2.3 times more likely to have HIV tests compared to their counterparts (AOR =2.3, 95% CI (1.4–4.0)) as shown in Table 3.

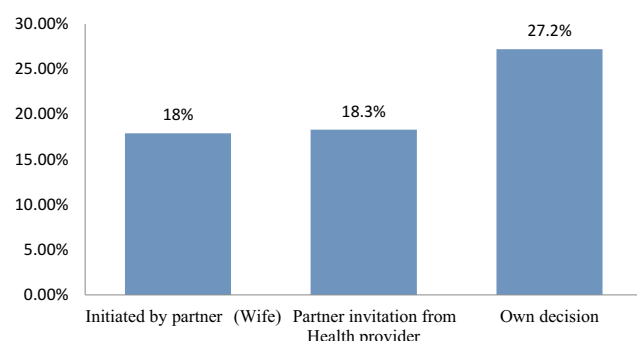
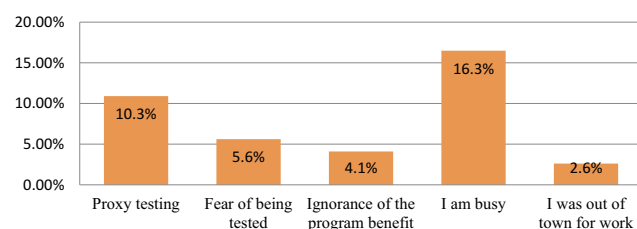
## Discussion

This study findings show that about 63.7% (95% CI 60–67%) of the men of pregnant woman partners had tested for HIV/AIDS. This finding is higher than to study conducted in Goba and Gondar town which was 22.7% and 40.1%, respectively.<sup>16,17</sup> The possible reasons for this might be the easily accessibility of transportation to reach health facilities. However, this study is lower than finding in a survey conducted by Abraham Haileamlak in Ethiopia (72%),<sup>26</sup> a study conducted in Rwanda which was 81% of the male partners being tested<sup>5</sup> and also a study conducted in Uganda revealed that the majority (more than 90%) of male partners who



**Table 2** Knowledge About HIV and PMTCT of Partners of Pregnant Women in Addis Ababa, Ethiopia, 2019

Variables	Yes		No	
	Frequency	Percent	Frequency	Percent
Knowledge on modes of HIV transmission	682	85.5	116	14.5
Unprotected sexual intercourse	745	93.4	53	6.6
Sharing of sharp material with infected person	695	87.1	103	12.9
Mother-to-child	594	74.4	204	25.6
Knowledge on route of MTCT	510	63.9	288	36.1
During pregnancy	613	76.8	185	23.2
During labour and delivery	544	68.2	254	31.8
During breastfeeding	532	66.7	266	33.3
Knowledge on PMTCT	306	38.3	492	61.7
ART during pregnancy	568	71.2	230	28.8
Delivering by C/S	285	35.7	513	64.3
Giving ART to the newborn	348	43.6	450	56.4

**Figure 1** Partners of pregnant woman decision made to get HIV counseling and testing, in Addis Ababa, Ethiopia, 2019.**Figure 2** Partners of pregnant woman reason for not being tested in Addis Ababa, Ethiopia, 2019.

attended the antenatal clinic accepted HIV counseling and testing for HIV.<sup>15</sup> The less partner HIV test in this study was attributed to being busy, which is the same as the study found in Goba.<sup>16</sup> Another reason attributed to men not being tested

was proxy testing the finding is congruent with that of the study done by Goba in Ethiopia.<sup>16</sup> But compared to the study that was made in Addis Ababa it is higher which shows 44% reported having been tested during the partner's pregnancy.<sup>25</sup> And this might be due to an increment of knowledge and awareness on HIV and PMTCT.

There are many factors associated with partner HIV test status, from this study Knowledge on the route of HIV transmission from mother to child ways had a positively associated with a partner HIV test. As the study in Gondar revealed, the likelihood of male involvement in HCT was found to be higher among those who knew the time and route of HIV from mother to child.<sup>17</sup> This evidence is also supported by the study conducted by Goba, those partners who knew modes of HIV transmission from mother to the child were more to receive HIV Counseling and testing compared to those who do not know.<sup>16</sup> This might be due to an increased level of knowledge and awareness about HCT expected to have a positive influence on men's involvement in HCT.

Couples who received HIV counseling and testing before had a positive association with partner HIV test. This is similar to a study from Midlands Province, Zimbabwe showed, those who previously tested for HIV with their wives as a couple is significantly associated with partner HIV testing and involvement in PMTCT.<sup>12</sup>

**Table 3** Bivariable and Multivariable Analysis Result for Variables Associated with Partner HIV Test in Addis Ababa, Ethiopia, 2019

Variables	Tested		COR(95% CI)	AOR(95% CI)	P-value
	Yes	No			
Education status					
No formal education	14	30	1	1	
Primary school (1–8)	62	77	1.7(0.8–3.5)	0.5(0.17–1.8)	0.358
Secondary school (9–12)	168	112	3.2(1.6–6.3)	0.8(0.2–2.584)	0.750
College and above	264	71	7.9(4.0–15.8)	1.0(0.3–3.6)	0.885
Occupation					
Governmental employee	195	52	7.3(3.9–13.5)	1.4(0.5–3.6)	0.492
Private	242	167	2.8(1.5–5.0)	1.2(0.4–2.9)	0.688
NGO	51	32	3.1(1.5–6.2)	1.0(0.3–2.95)	0.941
Daily labor	20	39	1	1	
Knowledge on modes of HIV transmission					
Yes	457	225	1	1	
No	51	65	2.5(1.7–3.8)	1.5(0.97–2.4)	0.067
Knowledge on route of HIV transmission from mother to child					
Yes	380	130	1	1	
No	128	160	3.6(2.6–4.9)	1.9(1.3–2.7)	0.000*
Knowledge on prevention of HIV from mother-to-child transmission					
Yes	259	47	0.18).13–26)	0.26(0.17–0.38)	0.000*
No	249	243	1	1	
Knowledge on the presence of HCT during ANC visit					
Yes	472	206	5.3(3.5–8.1)	1.1(0.6–2.2)	0.642
No	36	84	1	1	
Think partner testing is necessary					
Yes	506	257	32.4(7.7–136.4)	4.8(0.7–30.2)	0.088
No	2	33	1	1	
Ever received couple HIV counseling testing before					
Yes	440	153	5.7(4.1–8.1)	3.7(2.3–6.1)	0.000*
No	68	137	1	1	
Discussed about HCT ANC services with your partner					
Yes	404	78	10.5(7.5–14.7)	6.3(4.0–9.8)	0.000*
No	104	212	1	1	
Heard about discordant HIV test result					
Yes	439	160	5.1(3.6–7.2)	2.3(1.4–4.0)	0.001*
No	69	130	1	1	

**Notes:** \*Statistically significant at 95% CI, P< 0.05, 1= reference.

**Abbreviations:** COR, crude odds ratio; AOR, adjusted odds ratio; CI, confidence interval.

A study in Mekele revealed that partners who had been counseled and tested with wife were 5 times higher to go to ANC/PMTCT clinic and get HIV test than their

counterparts.<sup>21</sup> This implies that promoting couple HIV testing and counseling in all ANC and other HCT entry points might enhance male involvement in HIV testing.

Respondents who ever discussed ANC and HCT with their spouse were significantly associated with partner HIV tests. A study done in Midlands Province, Zimbabwe, mentioned male partners who received feedback from their wives on ANC issues were significantly more likely to be involved in PMTCT than those who did not receive any feedback.<sup>12</sup> Those partners who reported discussion about HCT with their wives had increased odds of involvement in HCT compared to their counterparts.<sup>17</sup> This suggests that open discussion between couples regarding HIV result is an important factor in increasing the number of men accompanying their spouses to antenatal clinics and accessing HIV counseling and testing services. Studies reported that poor discussion habit on ANC service utilization and the importance of couple HTC between partners was associated with poor male involvement in PMTCT.<sup>11,18,19,23,26</sup>

For this study awareness of discordant HIV test results among respondents was also one of the factors associated with partner HIV test. As the study in Rwanda and Zambia stated that awareness about sero-discordance was less. Low knowledge of the possibility of couple sero-discordance is a barrier to Couple HIV counseling and test uptake.<sup>22</sup> For this study results on awareness for sero-discordance might be high due to the information provided on HIV sero-discordance, where to access services, and the importance of HCT to prevent HIV transmission between partners.

## Conclusion and Recommendation

### Conclusion

HIV testing service utilization among pregnant women in the current study area was low, where national coverage in urban areas was 72%. The partner HIV testing was significantly higher among partners who have a knowledge on ways of prevention of transmission of HIV from mother to child, those who received couple HIV counseling before, those who discussed HCT at ANC services with a partner and heard about discordant HIV test result.

### Recommendation

#### Addis Ababa Health Bureau Should

- Increase the community awareness on male partner accompanying and testing service utilization during ANC follow-up to strengthen PMTCT.
- Advocate the greater importance of male partner testing during ANC/PMTCT.

## Stakeholders and NGO Partners Should

- Provide training on ANC/PMTCT.

## Health Care Providers Should

- Encourage male partner to accompany their pregnant spouse during ANC visit to get comprehensive ANC care,
- Provide health education regarding ANC/PMTCT places where men gather,
- Discuss about HCT at ANC with partner, disclosure of HIV test status and encourage the women to bring their partner.

## Abbreviations

AIDS, acquired immune deficiency syndrome; ANC, antenatal care; ART, antiretroviral therapy; CHTC, couple HIV testing and counseling; C/S, cesarean section; FGD, focused group discussion; HIV, human immunodeficiency virus; HCT, HIV counseling and testing; HEWs, health extension workers; MCH, maternal child health; PMTCT, Prevention of Mother to child transmission; SRH, sexual reproductive health; STI, sexual transmitted infections; UNAIDS, United Nation Programme on HIV and AIDS; UK, United Kingdom; VCT, voluntary counseling and testing; VLS, viral load suppression; WHO, World Health Organization.

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## Disclosure

The authors report no conflicts of interest for this work.

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