

Male partner voluntary counselling and testing associated with the antenatal services in Kinshasa, Democratic Republic of Congo: a randomized controlled trial

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Summary: Low male participation in voluntary counselling and testing (VCT) services at antenatal clinics (ANCs) represents a lost HIV-prevention opportunity. A three-arm randomized controlled trial (RCT) was conducted that offered VCT at a neighbourhood health centre, bar or church to the male partners of pregnant women attending a maternity unit in Kinshasa, Democratic Republic of Congo (DRC). The primary outcome was the proportion of male participation at VCT; secondary outcomes were uptake of couple counselling and determinants of male and couple participation. From a total of 2706 women included in the study, 591 male partners (22%) attended one of the three venues. Male participation was significantly higher in bars (26%, $P < 0.001$), and higher but not statistically significant in church-based VCT (21%, $P = 0.163$) compared with health centre VCT (18%). Male participation in VCT associated with ANCs was higher in non-health service settings, particularly in bars. A combination of different strategies rather than single targeted interventions will be needed to increase VCT uptake in male partners of women seeking VCT at ANCs.

Keywords: men, prevention, HIV, viral disease, testing, VCT, antenatal care, PMTCT

INTRODUCTION

Antenatal clinics (ANCs) have been widely and successfully used in several different settings and countries in sub-Saharan Africa as venues for voluntary HIV counselling and testing (VCT) of pregnant women and for the provision of subsequent services aimed at prevention of mother-to-child transmission (PMTCT) of HIV.^{1–3} Numerous studies throughout sub-Saharan Africa have demonstrated that antenatal care represents an opportunity for female health education and for VCT.^{4–7} Not using this period of intense female motivation to persuade the fathers of their unborn children to have a family health educational experience, including VCT, represents a 'missed VCT opportunity'.^{2,5} Barriers to involve male partners in the PMTCT programmes have been identified.^{8–11} Most reproductive health services, including the ANC services, are targeted specifically to women and tailored for women's needs, often resulting in stigmatization of men who present or would like to present at these services.^{8,12,13}

Efforts seeking to enable/empower women tested in ANCs for HIV to disclose their results to their sexual partner/father of their unborn child have also had limited success. Studies focusing on making ANCs 'user-friendly' for husbands have

been carried out, but no single strategy has been successful; a new paradigm is needed.^{9,14,15} We conducted a three-arm randomized controlled trial (RCT) of VCT for male partners of women undergoing VCT at the largest ANC, Kingasani in Kinshasa, Democratic Republic of Congo (DRC). The main objective was to identify useful alternative strategies for increasing the participation in VCT of men whose female partners had received VCT. A secondary objective was to explore potential factors associated with male and couple participation in VCT. We hypothesized that non-ANC VCT venues would result in higher VCT acceptance rates by male partners when compared with acceptance rates in traditional ANC settings.

METHODS

Study site

The study was conducted at Kingasani Maternity, Kinshasa, DRC. VCT in the context of PMTCT was introduced in 2002. About 10,000 deliveries occur each year in this clinic. More than 95% of all pregnant women attending ANC at Kingasani currently undergo VCT, but less than 2% of male partners invited for VCT have been tested over the past three years. The HIV prevalence among women presenting at ANC in Kinshasa is 4.3%.¹⁶ In the present study male partner VCT was conducted in three types of venues: bars, churches and neighbourhood health centres. Neighbourhood, availability of

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space for VCT, frequentation by men and willingness of the site's owner were the main criteria for venue selection.

Participants

Participants were enrolled from 1 September 2006 to 31 January 2007. Pregnant women presenting for ANC at Kingasani Maternity were enrolled if they were at least 18-years-old and consented to participate in the study. Those women who reported not knowing the father of the unborn baby or where the father of the unborn baby did not live in the city were excluded from the study. The male partner in this study was the father of the unborn child who was identified by the woman and to whom she brought the invitation following a routine ANC visit. We invited all adult men (aged at least 18 years) whose female sexual partners had received VCT at Kingasani Maternity.

Intervention

We designed a three-arm RCT corresponding to the three venues where the male partners were randomly invited via their female partners. The three arms consisted of: (1) neighbourhood health centre-based VCT; (2) bar-based VCT; and (3) church-based VCT. Pregnant women who presented to the ANC were given general information regarding the study prior to consenting for the study. Simple randomization was used to prepare the allocation sequence. Sealed envelopes containing the invitations for VCT to the three different venues were prepared in advance by a study supervisor.

During a routine ANC visit, consenting women picked up an envelope containing an invitation with corresponding arm number. Consenting women randomly selected invitations. Trained study nurses working at Kingasani Maternity performed the enrolment interviews/counselling for all consenting pregnant women.

Considering that most men living in the Kingasani neighbourhood work far away from their home, we invited male partners to the venue after normal working hours between 15:00 and 20:00. Pregnant women did not come to any of the three venues when their husbands presented at a specific venue for VCT.

Once at the venue, confidential pre-test counselling took place in a private room where patient confidentiality could be guaranteed. Trained counsellors conducted a pretest group confidential counselling session, consisting of: explanations about HIV/AIDS, client risk evaluation, risk reduction plan and phlebotomy for rapid HIV testing. This was followed by post-test group counselling, 30 minutes after phlebotomy. Services were free of charge and a reimbursement for transportation expenses was provided.

During the pretest counselling, every male partner had the opportunity to ask confidential questions before consenting to voluntary HIV testing. A trained counsellor conducted each VCT session according to the national AIDS Control Program guidelines, including collection of sociodemographic information and HIV-risk evaluation. A peripheral venous blood sample (~1.5 cm³) was drawn from consenting male partners for HIV rapid testing, using the Determine HIV 1/2 (Abbott Diagnostics, Wiesbaden, Germany), Double Check Gold HIV1&2 (Organics Ltd, Yavne, Israel) and Unigold HIV (Trinity Biotech PLC, Bray, Ireland). The HIV tests results

were provided to the clients the same day, and an invitation for a couple counselling visit within a week was extended to each client.

Couple counselling was conducted in a specific venue in two steps by a trained counsellor. Step one involved an individual session consisting of knowledge sharing about HIV/AIDS; risk reduction plan, informed consent for disclosure and psychological support. The second step (couple counselling session) consisted of a short discussion of knowledge regarding HIV/AIDS. The counsellor used the opportunity to encourage each client to share her/his HIV result with the partner. HIV discordant and HIV-positive concordant couples were referred to HIV/AIDS clinics in their immediate neighbourhood for care and support.

Outcomes

The primary outcome of the trial was male participation in VCT. We also sought to identify factors associated with uptake of couple counselling and determinants of male participation and couple counselling.

Sample size

Male participation was estimated to be 15% in the health centre-based VCT arm, and ~20% in one of the two arms (bar VCT or church-based VCT). With 80% power, 0.05 significance level and a 5% difference in male participation between the health centre and one of the two other arms, the required sample size was ~901 women per arm.

Data analysis

Epi-info software 2000 (Epi-Information™ 3.4.3; Centers for Disease Control and Prevention [CDC]) was used for the analysis. Descriptive statistics were performed. The mean with standard deviation and median with quartiles were used for quantitative variables. Categorical variables were summarized using proportions.

Unadjusted analyses were performed to assess the association between the intervention and the outcome: odds ratios (OR) were used to estimate the effect sizes. Chi square (χ^2) test with a *P* value <0.05 were used to test differences in proportions.

Multiple logistic regression was used to identify determinants of male participation (including female characteristics) and uptake of couple counselling (including male and female characteristics). Variables found to be significant in univariate analysis (*P* < 0.10) were included in the multivariate model. The final model was obtained by stepwise backwards elimination and the interaction terms were tested.

Ethical issues

Informed consent was obtained from all participants in the study. Participants received no incentive to participate in the study. Only transportation fees were refunded for those who participated in the couples counselling. The study protocol was approved by the Institutional Review Board of the Kinshasa School of Public Health.

RESULTS

A total of 2987 pregnant women were screened; 242 women were excluded because they did not meet the study selection criteria and 39 refused to participate. Details on the study participants flow are summarized in Figure 1.

Demographic characteristics

A total of 2706 pregnant women were enrolled; their mean age was 27 years. Eighty-five percent of study women had completed at least a secondary educational level; 68% were housewives. Detailed characteristics of the women are described in Table 1.

Among 2706 invited men, 593 (22%) presented at the venues, and almost all (99.6%) consented to be tested. The mean age of tested men was 36 years; 37% had at least a secondary educational level and 69% were unemployed (no stable work with a regular salary). Most men (93%) were married or cohabiting with the mother of the unborn child; 19% reported having had sex at least once with a casual partner during the three last months; only 40% of these men had used a condom during this episode. Detailed characteristics of the men are described in Table 2.

Individual VCT and couple participations

A total of 591 of the 2706 (21.8%) men reported to one of the three study venues and underwent HIV testing; 26.5% (236/891) were randomized to the bar venue; 20.9% (189/906) to the church venue and 18.3% (166/909) to the health centre venue. Male participation was 1.61 and 1.18 times more likely to occur at the bar venue (95% confidence interval [CI]: 1.28–2.01 [$P < 0.001$]), and the church venue (95% CI: 0.93–1.48

Table 1 Characteristics of pregnant women participants ($n = 2706$)

Characteristics	Total n	Health centres n (%)	Churches n (%)	Bars n (%)
Age (years)				
Mean (SD)	27	27 (5.9)	27 (5.7)	27 (5.8)
Education				
Completed primary or less	403	128 (14)	127 (14)	148 (16.6)
Secondary or more	2303	781 (86)	779 (86)	743 (83.4)
Profession				
Housewife	1846	712 (78.3)	561 (62)	573 (64)
Employed	788	175 (19.3)	313 (34.5)	300 (34)
Unemployed	72	22 (2.4)	32 (3.5)	18 (2)
Marital status				
Married/union	2435	799 (88)	819 (90.4)	817 (91.7)
Polygamous	198	96 (10.6)	50 (5.5)	52 (5.8)
Divorced/single	73	14 (1.5)	37 (4.1)	22 (2.5)
Religion				
Independent churches	1516	598 (6.8)	496 (54.7)	422 (47.6)
Catholic	568	173 (19)	204 (22.5)	191 (21.5)
Protestant	332	79 (8.7)	111 (12.3)	142 (15.0)
Other	289	59 (6.5)	95 (10.5)	135 (15.9)
Living together				
Yes	2336	780 (85.8)	793 (87.5)	763 (85.6)
No	370	129 (14.2)	113 (12.5)	128 (14.4)
Pregnancies				
≥ 2	1558	507 (55.8)	507 (55.9)	544 (61)
< 2	1148	402 (44.2)	399 (44.1)	347 (39)
Number of children with this partner				
< 2	1466	485 (53.4)	495 (54.6)	486 (54.5)
≥ 2	1240	424 (46.6)	411 (45.4)	405 (45.5)
Number of persons living in same house				
Mean (SD)	16	5 (3)	5.5 (2.8)	5.7 (3)
≥ 5	1512	531 (58.4)	508 (56.1)	473 (53.1)
> 5	1194	378 (41.6)	398 (43.9)	418 (46.9)
Cohabitation duration				
≥ 1 year	2165	750 (82.5)	689 (76.1)	726 (81.5)
< 1 year	540	159 (17.5)	216 (23.9)	165 (18.5)

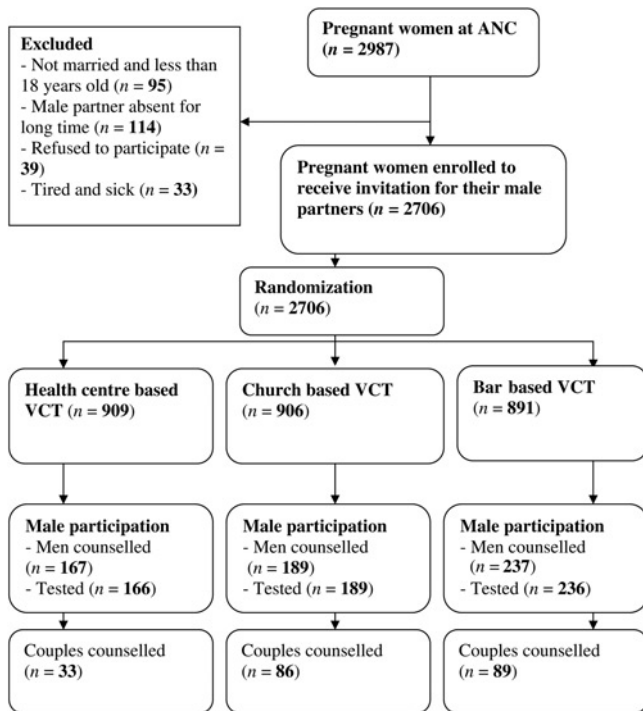


Figure 1 Study flow chart
ANC = antenatal clinics
VCT = voluntary counselling and testing

[$P = 0.163$]), respectively, compared with the health centre venue (Table 3).

All 591 men tested were invited for the couple counselling with their female partners. Only 208 (35%) men presented for couple counselling (95% CI: 31–39%). The attendance at the church venue was 45.5%, over three times (OR = 3.36 [95% CI: 2.08–5.42], $P < 0.001$) greater than at the health centre venue (19.9%). Couple counselling at the bar venue was 37.7%, more than double (OR = 2.44 [95% CI: 1.53–3.87], $P < 0.001$) the rate at the health centre venue (Table 3).

Fifty (1.8%) of the 2706 women and 13 (2.2%) of the 591 men were found to be HIV-positive. Among HIV-positive men, eight were tested at the health centre-based VCT, two at the church-based VCT and three at the bar-based VCT. A total of 571 (96.6%) couples were concordant negative, two (0.3%) concordant positive and 20 (3.3%) discordant.

Determinants for participation

Male participation in VCT

The following determinants reported by the pregnant women were retained in the final multiple logistic regression model:

Table 2 Characteristics of men who underwent VCT (n = 591)

Characteristics	Total n	Health centres n (%)	Church n (%)	Bars n (%)
Age (years)				
Mean (SD)	36.2	36.4 (7.9)	36.2 (8.4)	36 (7.6)
Education				
Completed primary or less	18	4 (2.4)	7 (3.7)	7 (3)
Secondary or more	573	162 (97.6)	182 (96.3)	229 (97)
Profession				
Employed	410	108 (65.1)	132 (70.1)	170 (72.2)
No profession/student	181	58 (34.9)	57 (29.9)	66 (27.8)
Marital status				
Married/union	550	154 (92.8)	180 (95.2)	216 (91.5)
Polygamic	29	10 (6)	4 (2.1)	15 (6.4)
Divorced/single	12	2 (1.2)	5 (2.6)	5 (2.1)
Religion				
Independent churches	206	76 (45.8)	57 (30.2)	73 (30.9)
Catholic	182	50 (30.1)	61 (32.3)	71 (30.1)
Protestant	93	27 (16.3)	29 (15.3)	37 (15.7)
Other	110	13 (7.8)	42 (22.2)	55 (23.3)
Use of condom				
Ever used	375	93 (56)	136 (72)	146 (61.9)
Sometimes	200	68 (41)	51 (27)	81 (34.3)
Often	15	5 (3)	1 (0.5)	9 (3.8)
Always	1	0 (0)	1 (0.5)	0 (0)
Non-official partner				
No	467	126 (75.9)	156 (82.5)	185 (78.4)
Yes	124	40 (24.1)	33 (17.5)	51 (21.6)
Sex with a casual partner				
No	476	133 (80.1)	160 (84.7)	183 (77.5)
Yes	115	33 (19.9)	29 (15.3)	53 (22.5)
Condom on this occasion*				
No	69	21 (63.3)	15 (52.5)	33 (61.7)
Yes	46	12 (36.7)	14 (47.5)	20 (38.3)

*'Condom on this occasion' refers only to those who answered 'yes' to 'sex with a casual partner'; VCT = voluntary counselling and testing.

age, marital status, religion, cohabitation and the VCT venue. VCT male participation was 1.22 (OR: 1.22; 95% CI: 1.01–1.49 and $P = 0.040$) times more likely to occur among men whose female partners were aged 25 years or more, and only half as likely (OR = 0.43; 95% CI: 0.20–0.93; $P = 0.031$) in polygamous partners. Participation was 1.57 (OR: 1.57; 95% CI: 1.14–2.17 and $P = 0.005$) times more likely to occur for men cohabiting with their female partners compared with men not cohabiting

Table 3 Male partner and couple counselling participation

Arm	Invited	Tested (%)	OR	CI 95%	P value
Male participation	n = 2706	n = 591			
Health centre based VCT	909	166 (18.3)	1.00	–	–
Church-based VCT	906	189 (20.9)	1.18	0.93 – 1.48	0.163
Bar based VCT	891	236 (26.5)	1.61	1.28 – 2.01	<0.001
Couple counselling	n = 591	n = 208			
Health centre based VCT	166	33 (19.9)	1.00	–	–
Church based VCT	189	86 (45.5)	3.36	2.08 – 5.42	<0.001
Bar based VCT	236	89 (37.7)	2.44	1.53 – 3.87	<0.001

OR = odds ratio; CI = confidence interval; VCT = voluntary counselling and testing

with their female partners (Table 4). Partners of women affiliated with the Roman Catholic Church were 1.30 (OR: 1.30; 95% CI: 1.03–1.64 and $P = 0.022$) times more likely to participate in VCT than partners of women affiliated with independent churches. After adjustment in the model, male participation remained 1.50 (OR: 1.5; 95% CI: 1.19–1.89 and $P < 0.001$) times more likely to occur at the bar-based VCT compared with the health centre-based VCT.

Couple counselling participation

Multivariate analyses were conducted for 507 couples in which men participated in individual VCT. The following determinants were retained in the final model: women's older age, man's religion and VCT venue. Couple counselling participation was 1.69 (OR: 1.69; 95% CI: 1.15–2.48 and $P = 0.007$) times more likely to occur among women aged 25 years and older, and 1.62 (OR: 1.62; 95% CI: 1.04–2.51 and $P = 0.030$) times more likely among men affiliated to the Roman Catholic church compared with independent churches. After adjustment, couple counselling participation was 3.37 (OR: 3.37; 95% CI: 2.07–5.48 and $P < 0.001$) and 2.48 (2.48; 95% CI: 1.54–3.98 and $P < 0.001$) times more likely to occur in church and bar venues compared with the health centre venue, respectively.

DISCUSSION

The main findings of this study are: (1) overall, 22% of men invited presented for VCT; (2) male participation in VCT was significantly higher in bars (26%) compared with health centres (18%); participation was higher but not significant in church-based VCT (21%) compared with health centre-based VCT; (3) couple counselling participation was significantly higher at church-based VCT (45%) and at the bar-based VCT (38%) compared with the health centre-based VCT (20%).

Male participation

Innovative strategies are still needed to increase male participation in VCT, as male involvement is a determinant for PMTCT uptake. Two studies conducted in Burkina Faso and Rwanda found an association between male participation and the acceptance of VCT during ANC attendance by pregnant women.^{3,17} PMTCT male participation has a positive impact on the acceptability of this intervention.^{18–22}

Despite many efforts to improve male involvement in VCT during ANC visits, there has been little progress in this domain.^{9,23} In our study, we found a significantly higher male participation in VCT at the bar venue compared with the health centre, but did not find a significant difference between the church-based venue and the health centre. A randomized trial conducted in Zambia found that the male participation rate in VCT in a local clinic was lower compared with VCT provided elsewhere.²⁴ Studies from sub-Saharan Africa have found that male participation levels in hospital settings vary between 12.5% and 18.7%.^{9,19,25} A study in Uganda found that non-health service VCT strategies reached a greater number of clients in general.²⁶ The World Health Organization (WHO)²⁷ recommends VCT for clients and their partners to be done in health facilities, but also to explore if other places would be acceptable and accessible.

Table 4 Female determinants of male participation in VCT (n = 2705)

Characteristics	Men expected n = 2705	Men tested n = 591	OR Crude	CI 95%	OR adjusted	CI 95%	P value
Age							
<25 years	1028	198 (19.2)	1.00	– –	1.00	– –	
≥25 years	1677	393 (23.4)	1.28	1.06 1.55	1.22	1.01 1.49	0.040
Marital status							
Divorced single	73	14 (19.2)	1.00	– –	1.00	– –	
Polygamous	198	25 (12.6)	0.60	0.29 1.24	0.43	0.20 0.93	0.031
Married/union	2434	552 (22.7)	1.23	0.68 2.23	0.85	0.45 1.60	0.617
Religion							
Independent churches	1517	300 (19.2)	1.00	– –	1.00	– –	
Catholic	568	140 (24.6)	1.32	1.05 1.66	1.30	1.03 1.64	0.022
Protestant	332	75 (22.6)	1.18	0.88 1.57	1.11	0.83 1.49	0.449
Others	288	76 (26.4)	1.45	1.08 1.94	1.36	1.01 1.84	0.038
VCT venue							
Health centre VCT	909	166 (18.2)	1.00	– –	1.00	– –	
Church based VCT	906	189 (20.8)	1.17	0.93 1.48	1.10	0.87 1.39	0.407
Bar based VCT	890	236 (26.4)	1.61	1.28 2.01	1.50	1.19 1.89	<0.001
Cohabitation							
No	369	57 (15.4)	1.00	– –	1.00	– –	
Yes	2336	534 (22.9)	1.62	1.20 2.18	1.57	1.14 2.17	0.005

VCT = voluntary counselling and testing; OR = odds ratio; CI = confidence interval

*One datum concerning the religion of a participant was missing. We conducted the logistic regression on 2705 instead of 2706

Before our study, male participation during PMTCT activities at Kingasani Maternity was <2%. During the study period male participation in the health centre increased to 18%. This was probably due to: the fact that the men were invited between 15:00 and 20:00, and by the use of the letter of invitation. In the DRC, ANC activities have traditionally been scheduled in the morning. This scheduling has had a negative impact on the willingness of men to participate. Employed men have difficulties accompanying their wives to the ANC during work time.^{12,13,19,28} Revision of the ANC schedule in order to get more men involved in ANC services would be a good starting point.

Even with the increased male participation at the health centre in our study, participation rates still remained low. The quality of health services will determine whether services (including VCT) are used. If waiting times at the clinics are long, male partners may refuse to accompany their wives to the ANC.²⁸ Capacity reinforcement and salary improvement for health service providers is necessary to improve the quality of health services.^{28–30}

Couple counselling

Couple counselling is effective in reducing HIV transmission among stable couples.^{31,32}

We considered male participation in the couple counselling session as a sign of their being engaged in the health of their family. During couple counselling, partners were asked to disclose their serostatus. VCT of partners of pregnant women is not only for their own advantage but also to the advantage of their families. It will lead to more support for women to increase uptake of antiretroviral therapy, family planning and nutritional advice.³²

The high participation in the church-based VCT may be due to the fact that the church is among the places where couples are accustomed to go regularly on a weekly basis, without social, economic or cultural constraints. Most participants (70%) in our study were members of a church. The participation rate in our study was higher than in studies conducted in

Rwanda and Zambia where the couple counselling participation rates were 26.9% and 9.6%, respectively.³³ Our study suggests that churches and bar settings could be effective alternative sites for scaling-up couple counselling.^{31,32}

The proportion of men who tested HIV-positive in churches (1.1%) and bars (1.3%) were close to the 1.3% HIV prevalence in the general population (results from the Demographic Health Survey conducted in the DRC in 2007).³⁴ The higher proportion of HIV-positive men tested at the health centre venue suggests that the health facility VCT strategy may result in identifying a larger number of HIV-infected people. In Uganda, hospital-based VCT identified a greater number of people living with HIV including those with lower CD4 counts, than with other strategies.²⁶

Determinants for participation

In our study and also in studies in Rwanda, Zambia and Cameroon, older women and men were more likely to participate in VCT and couple counselling.^{8,33} In a study in Burkina Faso cohabitation was also more likely to be associated with male VCT participation.³⁵ The reasons for the difference in participation rate of persons affiliated with the Roman Catholic Church when compared with those affiliated with independent churches are unknown.

A weakness of our study is the lack of data concerning the characteristics of men who did not come for VCT. Interviews with the women could not yield sufficient information about their partners. Thus data of these absent men were not included in the analysis. A second limitation was the lack of data concerning the follow-up of the participants. The study was limited to five months. Follow-up data beyond this period were not collected, e.g. data related to childbirth and PMTCT prophylaxis uptake. We did not explore how the information that male partners received during the VCT session might have promoted men to become more fully engaged in the health of their family. This issue merits additional research.

We were not able to collect data concerning the number of the men in each arm who actually received the letter of invitation

from their female partner. Although we used sealed envelopes, some women may have opened the envelopes and biased the uptake of the counselling at the different venues by not giving the letter to their male partner. We are not sure that the VCT venue mentioned in the invitation could have influenced women to give or not to give the invitation to their partner, and thus are not sure of the extent of this bias.

CONCLUSIONS

Male participation in PMTCT activities remains challenging, especially in developing countries. Innovative strategies are urgently needed to increase male involvement. A combination of different strategies rather than single targeted interventions will be needed.

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