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Male involvement for the Prevention of Mother-to-Child HIV Transmission: A Brief Review of Initiatives in East, West and Central Africa

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Abstract

Current trends in HIV/AIDS research in sub-Saharan Africa (SSA) highlight socially and culturally sensitive interventions that mobilize community members and resources for universal access to HIV prevention, treatment, and care services. These factors are particularly important when addressing the complex social and cultural nature of implementing services for prevention of mother-to-child transmission of HIV (PMTCT). Across the globe approximately 34% fewer children were infected with HIV through the perinatal or breastfeeding route in 2011 (*est.* 330,000) than in 2001 (*est.* 500,000), but ongoing mother-to-child HIV transmission is concentrated in sub-Saharan Africa, where fully 90% of 2011 cases are estimated to have occurred. Recent literature suggests that PMTCT in Africa is optimized when interventions engage and empower community members, including male partners, to support program implementation and confront the social, cultural and economic barriers that facilitate continued vertical transmission of HIV. In resource-limited settings the feasibility and sustainability of PMTCT programs require innovative approaches to strengthening male engagement by leveraging lessons learned from successful initiatives in SSA. This review presents an overview of studies assessing barriers and facilitators of male participation in PMTCT and new interventions designed to increase male engagement in East, West and Central Africa from 2000–2013, and examines the inclusion of men in PMTCT programs through the lens of community and facility activities that promote the engagement and involvement of both men and women in transformative PMTCT initiatives.

Keywords

HIV/AIDS; Antiretroviral therapy (ART); Prevention of Mother-to-Child HIV Transmission (PMTCT); Male involvement; Voluntary counseling and testing (VCT); Community Mobilization; Behavior Change

Introduction

The global HIV/AIDS epidemic is manifested by patterns of transmission that are as diverse as the communities burdened by the virus. However, HIV/AIDS in sub-Saharan Africa (SSA) is often referred to as one monotone epidemic that is not reflective of the diversity of cultures, infrastructure capabilities and national responses and priorities. In SSA, HIV transmission is mainly heterosexual in nature and disproportionately impacts reproductive-age women, sexually active young men, and children. Prevalence rates for HIV/AIDS in East, West and Central Africa vary substantially by country (Table 1). Historically, East (and Southern Africa) have had the highest prevalence of adult HIV/AIDS, while overall prevalence rates in West and Central Africa have remained comparatively low. These regional variations highlight the importance of HIV/AIDS prevention, care, and treatment programs that are molded to community needs and values and do not solely reflect theoretical dogmas associated with HIV/AIDS programming.

The Joint United Nations Program on AIDS (UNAIDS) estimates that 330,000 children globally acquired HIV in 2011, and 90% of these transmissions occurred in SSA. While there has been significant progress in averting pediatric HIV infections over the past decade, SSA continues to face serious challenges to achieving the lofty UNAIDS global plan of zero incident pediatric HIV infections by 2015. Of the 22 countries prioritized by the UNAIDS Global Plan, all but one (India) are in SSA [1]. The high HIV burden in Southern and East Africa spurred initiatives to scale-up access to antiretroviral therapy (ART) for pregnant women and reduce the rates of vertical transmission of HIV. However, while the coverage of programs to prevent mother-to-child HIV transmission (PMTCT) has seen more than a two fold increase in the past decade [2], many countries in West and Central Africa have failed to make significant strides towards meeting targets established by funding agencies and/or national Ministries of Health. For example, in 2011, between 75–100% of pregnant women living with HIV in South Africa, Swaziland, Botswana and Namibia received ART [1]. However, pregnant women in many West and Central African countries (Benin, Guinea, and Central African Republic) received ART at rates of 25% to 49%, while others (Angola, Chad, Congo and Nigeria) reported rates of less than 25%. Within some East African countries (Kenya, Burundi and Zambia) there were reported successes in the prevention of new pediatric HIV infections with rate reductions of 40–59%. Many West and Central African countries however, ranked poorly (Benin, Chad, Central African Republic, and Nigeria) with reductions of only 1 to 19%, while others (Angola, Congo, and Guinea-Bissau) actually reported increases in new pediatric HIV infections in 2011 [1].

Until recently, PMTCT programs in SSA have focused on women, with men often relegated to the background. This is in spite of the fact that in SSA men possess social and economic power and often play a major role in their partners' health decision-making. Recent

literature offers evidence of significantly improved outcomes linked to involvement of male partners throughout each prong of the PMTCT framework. In the following sections we will discuss the role of men in PMTCT in East, West and Central Africa, including examples of successful programs, and discuss recommendations in support of the enhancement of male involvement in PMTCT.

The Four Prongs of PMTCT

The United Nations advocates a four-pronged strategy as the basis for national programs to prevent the vertical transmission of HIV. These four prongs combine several HIV prevention and treatment approaches that target the spectrum from preconception to beyond infancy, ensuring ongoing care, treatment and support for mothers and families affected by HIV. Prong 1 addresses primary prevention of HIV infection among women of childbearing age. It covers issues of reproductive health (preconception, pre- and post-delivery) within current community infrastructure and culture. Prong 2 targets women already living with HIV, providing them with supportive counseling for planned pregnancies and optimizing maternal and child health outcomes. Prong 3 provides HIV-infected pregnant women access to HIV voluntary counseling and testing (VCT), and to antiretroviral therapy (ART) for the purposes of the prevention of mother-to-child HIV transmission. An expanded version of prong 3 that details the integrated continuum of care necessary to effectively prevent mother-child HIV transmission is referred to as the 'PMTCT cascade' (Fig. 1). Prong 4 focuses on ongoing HIV care, treatment and support to HIV-infected mother-infant pairs and their families. The four-pronged strategy provides a comprehensive approach to tackling the multifaceted dimensions of HIV infection, prevention, care and support, and treatment [2, 3].

The PMTCT Cascade

The PMTCT cascade (Fig. 1) is a complex series of sequential steps that a pregnant woman must navigate in order to effectively reduce the risk of HIV transmission to her child. The steps include maternal HIV VCT and receipt of results (usually in ANC settings), WHO clinical staging and CD4+ cell count testing, initiation of ART, skilled delivery care, early infant diagnosis, cotrimoxazole therapy and ART for infected children. At each step of the process loss to follow up of mothers and infants is a major challenge to program effectiveness [4–7]. An approach that is effective in lowering attrition along the PMTCT cascade is the engagement of men in PMTCT programs, and especially participation in couples VCT. This strategy confers additional benefits of improved adherence to ART and increased HIV-free infant survival [8–10]. The next section of this review will examine barriers and facilitators to male participation in PMTCT, focusing on each segment within the PMTCT cascade.

Barriers to male participation in antenatal care

The antenatal clinic (ANC) provides a unique setting to test, counsel and treat pregnant women and their partners. However, major barriers persist in motivating men to join their partners in antenatal care and utilize PMTCT services. Despite generally positive male attitudes towards pregnant women seeking antenatal care and PMTCT services, the

participation of men is seen as socially and logistically problematic [11–16]. Multiple studies report low male attendance at ANC sites in East, West and Central Africa - rates of partners attending at least one ANC visit ranging from 1.8 to 32% [8, 17–25]. Recent systematic reviews have identified barriers to male involvement in PMTCT programs in sub-Saharan Africa [16, 26]. In East, Central and West Africa common barriers cited were sociocultural in nature (including gender inequality and normative social roles that limited male participation), deficits in HIV or ANC knowledge, a health system infrastructure or culture that discouraged male engagement, or personal characteristics, including age or occupation associated with willingness to engage in PMTCT [11, 26–28].

Several studies highlight cultural barriers related to gender power dynamics wherein men perceive ANC to be the sole responsibility of women and gender norms that disapprove of males engaging in antenatal care activities [8, 11–13, 15, 18, 20, 23, 25, 26, 29–33]. Women in turn perceive men's primary role to be financial, specifically to pay for ANC services, and not to actively participate in the services, even though in many studies women indicated that they would prefer their partners to accompany them to ANC [12, 32, 34]. These gender-specific attitudes dampen the ability of couples to communicate on sexual and reproductive health matters (such as condom use and partner HIV testing) within stable relationships and to negotiate partner presence and support during antenatal clinic visits [26, 31, 35]. This lack of communication is also associated with marital disharmony and intimate partner violence, both recognized risk factors for HIV infection [11, 12, 16, 20, 26, 36, 37]. Male partners have also expressed being concerned with how their participation in ANC visits would be perceived by their friends and family. Men who accompany their partners to ANC services may be perceived as either being controlled by their partners or as jealous or overprotective [12].

Barriers at the health system level exacerbate challenges to male participation in PMTCT at ANC sites. A survey of health care workers found that even though there was overall endorsement of male involvement in antenatal care, there was some resistance in involving men in certain activities, such as the labor and delivery process [38]. Male partners have also reported dissatisfaction with services provided during antenatal visits. Partners reported they were poorly treated by healthcare workers, they feel ostracized or unwelcome in the health facilities, long wait times were unacceptable, and the lack of space to accommodate them in antenatal clinics made it impossible to accompany their partners [16, 19, 26, 30, 32, 33, 36]. Another barrier reported in multiple studies was inconvenient timing - the operating hours of ANC clinics often conflict with the work schedule of male partners [8, 12, 16, 26, 30, 33, 39]. Given limited quantities of time and money, male partners felt they had to make a value judgment about the importance of their participation versus a financial contribution - some men believed it was more important to financially support their partners' pregnancy-related healthcare costs rather than physically be present during clinic visits [12]. Certain patient sociodemographic characteristics have been identified as contributors to reduced male involvement in PMTCT initiatives within ANC care settings. Socioeconomic constraints such as lower education, older age, low income and/or resources are documented barriers to male involvement [11, 19, 29, 32]. Studies in Kenya found that men who reported prior HIV testing were more likely to attend ANC with their spouses [10, 19]. This report is not surprising, as such men are likely to have less stigmatizing attitudes, while also possessing

greater HIV-related knowledge. Men with fewer children and less knowledge about PMTCT were also more likely to successfully complete voluntary PMTCT counseling, possibly indicating a wish to better prepare for fatherhood [19]. Other reports have shown that being in a solidified relationship (i.e., married) promotes male involvement in care [16, 19].

Attitudes on HIV Testing and Results

Within the dynamics of traditional African societies women often have limited autonomy to make health care decisions [40]. Studies have shown that partner approval is inherently linked and is a predictor of women's utilization of HIV testing services [23, 41–43]. Prior to accepting HIV testing women often wish to discuss the decision with their partners [23]. When women are accompanied by their male partners they are more likely to accept HIV VCT and to receive their results [19, 20]. This is particularly important, as PMTCT initiatives must promote the livelihood of entire families, not just pregnant women and their infants [24]. Men and women across several studies indicated that fear of being tested for HIV was a barrier to the use of ANC services. Men often cited fear in knowing their HIV status, while women highlighted additional concerns of being abandoned and intimate partner violence (IPV) resulting from disclosure of a positive HIV test [1, 26, 27, 41, 44]. The fear of stigma and negative reactions from community members from unsanctioned disclosure of HIV status are also recognized barriers to couples VCT [18, 27, 36, 39, 45].

Antiretroviral therapy and adherence

Adherence to antiretroviral therapy (whether the older approach of provision of zidovudine monophylaxis or the modern provision of highly active ART) is a strategic requirement for effective PMTCT programs. The involvement of male partners is an important consideration in the woman's decision to receive and adhere to antiretroviral medications for prophylaxis or treatment [8, 18]. Lack of disclosure of HIV status to partners has been associated with reduced rates of ART initiation [46]. A study in Rwanda found that two-thirds of women waited on their partners' permission prior to beginning ART [47]. Male participation in VCT impacts post-test counseling, improves communication and increases adherence to antiretroviral treatment [8, 18, 31, 48]. In one study, of the women who tested HIV positive, those who received VCT with their partners were eight times more likely to begin ART and thrice as likely to adhere to treatment and return for care after delivery [8]. Providing access to medications for male partners also increases the adherence of female participants in PMTCT [40].

Early infant diagnosis, family planning and other postpartum activities

At the final stage of the cascade there are several important decisions that affect the outcome of vertical transmission of HIV. Many of these decisions have financial and social implications and are often decided by the male partner. The economic reality of transportation to and from the clinic for delivery, well-child visits, medication pickups and early infant diagnosis testing provides opportunities for loss to follow up [11, 36]. Delivery location, postpartum practices, and infant feeding recommendations could also deviate from societal norms leading to required disclosure of HIV status to the partner, or could constitute an implied disclosure to the community [39, 45, 49]. Not surprisingly, the disclosure of

status to the partner is positively associated with adherence to infant feeding recommendations [46, 50]. The likelihood of adherence to infant feeding recommendations is also closely linked to male partner acquiescence [51]. In Kenya, male partner involvement in VCT was associated with increase in uptake of formula use [8], and in Tanzania women whose partners agreed to accompany them and undergo HIV testing were six times more likely to adhere to the recommended infant feeding method than those whose partners did not participate in VCT [18].

The early initiation of ART in HIV-infected infants is associated with improved clinical and immunological outcomes, [52, 53] but this is only possible if HIV-exposed infants are enrolled into early infant diagnosis (EID) programs in a timely manner. Because EID uptake rates are dependent on the mother, it is expected that postpartum male partner involvement plays an important mediating role in EID uptake. The postpartum period is also an ideal time for family spacing decisions. However, in patriarchal settings women may not be empowered to discuss condom use for HIV prevention and family planning (“dual method use”) as condom use within marriage is sometimes associated with infidelity and distrust [37]. Desgrees-Du-Lou et al. found that participation in VCT improved communication about HIV-related risks, regardless of HIV status or VCT acceptance. This improved partner communication was positively correlated with increased condom usage, despite the fact that condoms are not culturally well accepted within stable relationships [31]. An analysis of condom use in Malawi revealed that the discussions surrounding condom use are more likely to occur in the context of extramarital sexual liaisons, with only 2.3% of participants reporting condom use with a spouse or cohabiting partner [35]. However, when male partners were involved in ANC, women were more likely to follow recommended health and feeding guidelines to prevent HIV transmission, including the use of condoms and other contraceptives [18, 54].

What works

There have been some successful initiatives within the East, West and Central African region aimed at improving adherence to the recommendations of the PMTCT cascade through increased male participation (Table 2). Many of the studies encouraged dialogue between partners and urged communication about VCT [8, 10, 18, 21, 31]. In Uganda, letters were addressed to male partners inviting them to accompany their spouses to their next ANC visit (“love letters”). This study also recognized structural barriers to male involvement associated with work schedules and worked with couples to arrange convenient appointment dates [21]. A recent randomized control trial, in Kenya, compared the effectiveness of inviting male partners to participate in VCT at the ANC using letters of invitation versus an in-person invitation by a health worker during a home visit. The results indicated an upsurge, when compared to previous investigations, with an 85% contact rate with male partners. In the home based arm a significant increase was seen in couples VCT, with male partners more than two times more likely to agree to VCT and couples thrice as likely to discover a sero-discordant relationship. Importantly, IPV did not differ significantly between the two arms of the trial at baseline or in subsequent follow up [55]. Other studies in the Democratic Republic of Congo and Kenya found that use of indirect approaches, such as using peer counselors and approaching men in community-based settings such as bars and

churches improved male participation and female adherence to the PMTCT cascade [8, 24, 54]. Successful programs shifted the burden of requesting engagement of male partners from the pregnant women to the health system (through letter delivery) or a team of community health workers and addressed gender inequality through couples counseling or community-based interventions.

Conclusions and Recommendations

Men are a vital yet under-utilized human resource to promote PMTCT throughout East, West and Central Africa. This review demonstrates the need for effective and sustainable male-friendly initiatives that ensure the existence of welcoming healthcare facilities that provide culturally appropriate and family-centric services for the prevention of the vertical transmission of HIV. The following recommendations are presented for consideration in the promotion of male involvement in PMTCT initiatives at all levels of the cascade.

First, government health policies should normalize and provide guidance at all levels of health care in terms of male participation. National ANC policies should seek to restructure maternal health clinics so that they are culturally and practically acceptable to men. For example, PMTCT sites should have adequate space, flexible hours of operation, and consistent policies and regulations to accommodate expectant mothers and their spouses/partners. Staff should work with couples to schedule ANC appointments that are suitable to their needs. Further, clinic staff should be adequately trained on organizational policies towards male involvement, importance of male involvement, and how to best promote male involvement in PMTCT. It should also be understood that the livelihood of families is greatly dependent on the survival of not just mothers and children, but also men who are often the financial backbones of these families. Additionally, initiatives should be careful to clearly state the significance and the voluntary nature of HIV testing, counseling and other PMTCT initiatives to community members. While creating more male-friendly services, health facilities should also develop quality counseling and legal services to ensure engaging men in ANC and PMTCT does not result in increased IPV or abandonment after disclosure. Ministries of health should collaborate with other organizations to meet goals in eliminating new HIV infections in children with appropriate data collection to assess the gaps, impacts and outcomes of PMTCT initiatives in East, West, and Central Africa.

Second, PMTCT programs should promote positive shifts in male attitudes and behavior that favor women's health by focusing on changing social and behavioral norms, drawing on support from community influencers to normalize male engagement in all aspects of PMTCT. Examples include utilizing HIV infected peer counselors from the community to work directly with couples, male "champions" advocating for changes in gender norms through education, counseling and behavior modeling, and theater groups highlighting current social norms, their negative impact on women and children, and new culturally acceptable solutions. Men need behavioral and practice skills to more fully contribute to their spouse's reproductive health. This will require education on pregnancy, HIV transmission and treatment, and family planning. These behavior change strategies should help to ignite constructive conversations surrounding sexual health and gender equality,

reduce stigma surrounding HIV and HIV testing, and prompt the acceptance of HIV/AIDS education, prevention and care programs, particularly in PMTCT initiatives.

Finally, approaches that are adaptive to prevailing male cultural norms are more likely to succeed. Programmers and policy makers should recognize and address the cultural and social barriers surrounding gender and sexuality that exist within relationships and throughout communities, and work with community members and leaders to promote open and positive attitudes surrounding gender and sexuality. Examples include offering couples VCT at home, the use of personal invitations, community outreach, and the utilization of community leaders and members to promote the recruitment of expectant fathers into ANC sites for HIV testing and couples counseling. These strategies will help to remove the burden placed on women to convince their spouses to attend ANC and promote the goal of decreased vertical transmission of HIV.

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Figure 1. PMTCT Cascade

The PMTCT cascade is a complex series of sequential steps to effectively reduce the risk of HIV transmission to her child. The steps include maternal HIV VCT and receipt of results (usually in ANC settings), WHO clinical staging and CD4+ cell count testing, initiation of ART, skilled delivery care, early infant diagnosis, cotrimoxazole therapy and ART for infected children.

Table 1

The Epidemiology of the HIV Epidemic in East, West and Central Africa, by Country

Country (<i>by region</i>)	GDP 2012 (<i>USD, millions</i>)	Number of PLWHIV	% Adult Prevalence	Number of Women living with HIV (<i>reproductive ages 15–49</i>)	Number of Children living with HIV (<i>ages 0–14</i>)
East Africa					
Comoros	595.9	7,900	2.1%	2,300	–
Eritrea	3,091.8	18,000	0.7%	8,800	3,100
Ethiopia	43,133.1	760,000	1.3%	380,000	170,000
Kenya	37,338.1	1.6 million	6.1%	820,000	200,000
Madagascar	9,975.1	59,000	0.5%	23,000	–
Malawi	4,263.8	1.1 million	10.8%	560,000	180,000
Mauritius	10,492.0	11,000	1.2%	2,800	–
Mozambique	14,587.7	1.6 million	11.1%	810,000	180,000
Rwanda	7,103.0	210,000	2.9%	100,000	27,000
Seychelles	1,032.2	–	–	–	–
Tanzania	28,248.81	1.5 million	5.1%	730,000	230,000
Zambia	20,678.0	1.1 million	12.7%	490,000	160,000
Zimbabwe	10,813.9	1.4 million	14.7%	700,000	180,000
West Africa					
Benin	7,557.3	72,000	1.1%	37,000	9,100
Burkina Faso	10,441.0	110,000	1.0%	55,000	21,000
Burundi	2,472.0	89,000	1.3%	43,000	17,000
Cape Verde	1,897.4	<1000	0.2%	<500	–
Côte d'Ivoire	24,660.4	450,000	3.2%	220,000	63,000
Gambia	917.3	14,000	1.3%	7,600	–
Ghana	40,710.8	240,000	1.4%	120,000	28,000
Guinea	6,767.9	120,000	1.7%	63,000	–
Guinea-Bissau	897.4	41,000	3.9%	21,000	5,900
Liberia	1,767.1	22,000	0.9%	11,000	3,700
Mali	10,308.1	100,000	0.9%	50,000	–

Country (by region)	GDP 2012 (USD, millions)	Number of PLWHIV	% Adult Prevalence	Number of Women living with HIV (reproductive ages 15–49)	Number of Children living with HIV (ages 0–14)
Mauritania	4,199.1	10,000	0.4%	5,000	–
Niger	6,568.2	46,000	0.5%	20,000	–
Nigeria	262,605.9	3.4 million	3.1%	1.7 million	430,000
Senegal	14,159.8	43,000	0.5%	24,000	–
Sierra Leone	3,796.0	58,000	1.5%	31,000	5,800
Togo	3,813.8	130,000	2.9%	65,000	17,000
Central Africa					
Angola	114,197.1	250,000	2.3%	130,000	30,000
Cameroon	24,984.0	600,000	4.5%	310,000	59,000
Central African Republic	2,139.0	–	–	–	–
Chad	11,018.0	210,000	2.7%	100,000	34,000
Congo, Republic	13,667.9	74,000	2.8%	36,000	13,000
Democratic Republic of Congo	17,869.7	480,000	1.1%	230,000	88,000
Equatorial Guinea	17,697.4	17,000–49,000	3.4–9.7%	8,500–24,000	1,700–6,100
Gabon	18,661.1	41,000	4.0%	25,000	3,600
São Tome and Principe	263.7	1,400	1.0%	<100	–

Footnote: Estimates derived from UNAIDS 2013 Report [1] and World Bank 2013 report [56]. “–” denotes unavailable data.

Table 2

Examples of successful PMTCT Programs With Male Involvement: East, Central, and West Africa, 2004–2011

Study	Design	Sample	Findings
<i>East Africa</i>			
Byamugisha <i>et al</i> 2011 Uganda [21]	RCT of women giving ANC invitation letters to their male partners.	N = 1060 women attending ANC services in a referral hospital.	Significant increases in male participation in ANC and testing were observed (OR-1.2, 95% CI: 0.8–1.6; OR-2.1; 95% CI: 0.6–7.5).
Farquhar <i>et al</i> 2004 Kenya [8]	Observational study; women encouraged to tell their male partners about VCT; HIV+ peer counselors counseled participants.	N = 2836 women attending ANC services in an urban clinic.	Women presenting with HIV+ partners were 3x more likely to return for nevirapine prophylaxis (P = 0.03). 88% of HIV+ women who were coupled counseled vs. 67% of women whose partners came but were not couple counseled reported nevirapine use (P = 0.006).
Aluisio <i>et al</i> 2011 Kenya [10]	Prospective cohort study, 1999–05. Women were encouraged to tell their male partners about VCT.	N = 536 HIV+ pregnant women attending ANC services in an urban clinic.	Risk of vertical HIV transmission was 44% lower when men accompanied their female partners to ANC visits than if women attended alone (HR = 0.56, 95% CI 0.33–0.98).
Msuya <i>et al.</i> 2008 Tanzania [18]	Descriptive study 2002–2004 of the prevalence and predictors for male partner participation in VCT.	N = 2654 third trimester women participating in a PMTCT program asked to invite partner for VCT.	332 male partners (12.5%) came for VCT; 40% of these came post-delivery. HIV+ women whose male partners attended VCT were 3 and 4 times more likely to use nevirapine and abstain from breastfeeding, respectively.
<i>Central Africa</i>			
Multi-stakeholder PEPFAR project 2009–14 DRC [54]	Community based program in 5 DRC provinces.	Used “community champions” to promote increased male involvement in PMTCT by addressing sociocultural barriers, promoting healthy gender norms, and reducing HIV stigma.	Promoted increased HIV knowledge in women, condom and other contraceptive use, and utilization of ANC services.
<i>West Africa</i>			
Desgrées-Du-Loû <i>et al.</i> 2009 Côte d’Ivoire[31]	Prospective cohort study (2001–2005) of condom use, couple communication on HIV and STIs, and male partner testing. Women encouraged to suggest HIV testing to their partners.	3 groups of women were followed: 475 HIV+ , 440 HIV– , 62 refused testing	Communication with male partners on HIV prevention increased after prenatal VCT (P <0.01) as was male partner HIV testing (OR-4.03; 95% CI 1.50–10.82).
Tonwe-Gold <i>et al.</i> 2009 Côte d’Ivoire [33]	Descriptive study of a family-focused PMTCT plus program of men and women enrolling between 2003–2005	605 HIV+ pregnant/post-partum women and 582 HIV-exposed infants	457 men enrolled in the program (53% tested positive); overall the program was successful at providing family-focused services to all family members at points along the PMTCT cascade.

Footnote: Randomized controlled trial (RCT), Voluntary counseling and testing (VCT), Democratic Republic of Congo (DRC), Prevention of Mother to Child Transmission (PMTCT)