

## Prevention of Mother-to-Child Transmission of HIV in Ethiopia: A Literature Review

Tefera G Negash<sup>1</sup>, Valerie J Ehlers<sup>2</sup>

<sup>1</sup>D Lit et Phil Graduate, Department of Health Studies  
University of South Africa, South Africa

<sup>2</sup>Emeritus Professor and Research Fellow, Department of Health Studies  
University of South Africa, South Africa

---

### Abstract:

**Background:** The prevention of mother-to-child transmission (PMTCT) of Human Immune Deficiency Virus (HIV) in Ethiopia programs comprise primary prevention of HIV infections, family planning, anti-retrovirals, treatment and regular medical check-ups.

**Methods:** Ethiopian PMTCT-related studies' findings 2009-2014 were analyzed.

**Results:** PMTCT utilization included human resource issues, inadequate coordination among health services, erratic supplies of laboratory test kits and anti-retrovirals, stigma, ineffective monitoring and referral structures. Most respondents were satisfied with the PMTCT services. Pregnant women with high levels of perceived susceptibility, younger women, married women, employed women, women knowledgeable about HIV, and women with two or more prenatal clinic visits were more likely to be tested for HIV. Exclusive replacement infant feeding and mixed infant feeding were practiced. A progressive decline in medication adherence rates occurred during PMTCT interventions.

**Conclusions:** Challenges that impacted on PMTCT service utilization in Ethiopia included clients' satisfaction levels with services, infant feeding practices and using anti-retrovirals. Evidence, from research reports should be implemented to enhance Ethiopia's PMTCT program's treatment outcomes.

### Abbreviations:

AIDS - Auto Immune Deficiency Syndrome  
ANC - antenatal care  
ARVs- anti-retrovirals  
EBF - exclusive breastfeeding  
FMoH - Federal Ministry of Health (of Ethiopia)  
HCT - HIV counselling and testing  
HIV -Human Immune Deficiency Virus  
MTCT – mother-to-child transmission (of HIV)  
OR - odds ratio  
PMTCT – prevention of mother-to-child transmission (of HIV)  
VCT - voluntary counselling and testing (for HIV)

---

## 1. INTRODUCTION

The 2011 United Nations' political declaration on HIV/AIDS pledged to end the AIDS epidemic, based on 10 targets by 2015. Prevention of mother-to-child transmission of HIV (PMTCT) targets include eliminating new infections among children and substantially reducing the number of women dying from AIDS-related causes and to provide anti-retrovirals (ARVs) to 15 million people [1]. Global coverage of ARVs for PMTCT increased from 57% in 2011 to 63% in 2012. The number of newly HIV-infected children in 2012 was 260 000 in low and middle income counties, showing a 52% decline since 2001. Reportedly, PMTCT services prevented more than 670 000 children from becoming infected with HIV from 2009 to 2012. Nevertheless, in Ethiopia fewer than 50% of HIV-positive pregnant women reportedly used PMTCT services in 2012 [2].

The strategy to eliminate new infections among children comprises [3]: primary prevention of HIV infections, family planning, antiretroviral therapy (ART), as well as care, treatment and regular medical check-ups [4]. This global plan strives to eliminate new HIV infections among children and improve the health of mothers by 2015. In order to accomplish this ideal, new HIV infections among children should be reduced by 90%, the number of women dying from HIV-associated conditions during pregnancy, delivery and postpartum should decrease by 50% and mother-to-child transmission (MTCT) of HIV should be less than 5%. In 2010, 35% of pregnant women in low and middle income countries used voluntary counselling and testing (VCT) services compared to 26% in 2009. In Sub-Saharan Africa (SSA) this coverage increased from 35% to 42%. During 2010 the coverage of PMTCT regimens was 48%. Of the estimated 1.49 million infants born to HIV-infected mothers globally, 42% received ARVs [4].

The HIV prevalence in Ethiopia is 1.5% among adults aged 15-49, 1.0% among men 1.9% among women, but in Addis Ababa it is 5.2%, 4.3% among men and 6.0% among women. The HIV prevalence among antenatal care (ANC) clinic attendees during the preceding three years in the public sector was 1.7% while it was 3.1% outside the public sector [5]. The Federal Ministry of Health (FMoH) of Ethiopia indicated that the number of PMTCT-providing health facilities increased from 32 in 2004 to 1 352 in 2010 and to 1 445 by the end of June 2011. However, in 2011 only 24% of HIV-positive pregnant women used PMTCT services, indicating possible missed opportunities to reduce the impact of HIV/AIDS in Ethiopia [6].

The study aimed to identify factors, reported in published research reports, that influence Ethiopian women's utilization of PMTCT services.

## **2. MATERIALS AND METHODS**

A systematic review was done of reports addressing PMTCT-related issues in Ethiopia. Different themes were selected namely: clients' satisfaction levels with PMTCT services, voluntary counseling and testing (VCT), infant feeding practices and using ARVs for PMTCT.

A study was included in the literature review when it targeted pregnant women and/or HIV exposed infants; identified barriers affecting the utilization of PMTCT services, evaluated PMTCT services and/or outcomes; and was conducted in Ethiopia.

Information sources included the United States National Library of Medicine Gateway System (PubMed), Google Scholar, the World Health Organization (WHO) and UNAIDS websites to identify studies conducted from 2009 to 2014.

Relevant research reports were grouped according to:

- studies undertaken on factors affecting PMTCT service utilization
- client satisfaction levels with PMTCT services
- studies done on VCT
- infant feeding practices for PMTCT and
- ARVs used for PMTCT.

## **3. RESULTS AND DISCUSSION**

### ***Factors affecting PMTCT service utilization***

A study in the Oromia region of Ethiopia showed that challenges of the PMTCT program included human resource limitations, inadequate coordination between regional and local health services concerning new policies and guidelines, irregular supplies of laboratory test kits and ARVs [7, 19]. A study conducted in the Arba Minch area of Ethiopia [19], reported that out of 74 HIV-positive pregnant women, only 7% gave birth to their babies at health care institutions. HIV stigma prevented HIV-positive women from using health facilities so as not to disclose their HIV status to others. Health care providers were not keen to assist HIV-positive women during the births of their babies. Health facilities' inadequate monitoring and referral structures and inadequate ARV supplies, cost of accessing the services and poverty prevented some pregnant women from utilizing PMTCT services.

In the Tigray region of Ethiopia [9], researchers found that mothers, whose babies were born at health facilities, were 14 times more likely and their babies were seven times more likely to use PMTCT

services compared to those mothers whose babies were born at home. Mothers from urban areas were more likely to use PMTCT services than mothers from rural areas.

### *Women's satisfaction with PMTCT services*

Reportedly 61.6% of pregnant women used prenatal services (including VCT) on the same day that they visited public health facilities in Addis Ababa. On average the women waited at the prenatal clinics for 39.8 minutes and the VCT counselling (pre and post-test sessions) took about 14 minutes. These women acquired more knowledge about HIV and MTCT, the importance of their partners' HIV testing, living with HIV if HIV-infected, HIV prevention and HIV transmission. Most women were satisfied with counseling rooms' privacy (82.5%), with the counselors' services (92.2%) and with the providers' technical competency (91.5%) [10].

In Adama, in the Oromya region of Ethiopia, interviews conducted with 423 women revealed that they waited for an average 24.5 minutes to see a counsellor, spent 12.8 minutes with their healthcare providers and were satisfied with the PMTCT services (74.7%) [11].

### *Factors influencing women's utilization of VCT services*

In the north western region of Ethiopia, most women did not perceive themselves to be susceptible to HIV because they were reportedly married to faithful husbands. Women who perceived themselves to be susceptible to HIV were three times more likely to accept VCT [12].

Research involving 332 pregnant women in the Gambela region of Ethiopia, indicated that age played no role in VCT utilization as the median age was 23 years for those willing to be tested and 22 years for those who refused testing. Women with lower education levels were more likely to refuse HIV testing services. If the pre-test counseling was rated as being "fair", then pregnant women were six times more likely to refuse HIV testing than when it was rated as being "very good". Women who worried about privacy issues during VCT were five times more likely to refuse HIV testing than women who expected privacy during VCT. Pregnant women who had given birth to two or three live infants were more likely to refuse VCT compared to those who had not given birth to a live infant [13].

In Diredawa, Ethiopia, factors influencing 234 women's acceptance of VCT were studied. Women aged 30 and older, were 78% less likely to accept VCT than women aged 19 or younger. Married women were more likely to accept VCT than single women (OR=22.5). Employed women were four times more likely use VCT services than their unemployed counterparts. Ethnicity, religion, educational status and family size were not associated with acceptance of VCT. Women who were knowledgeable about HIV, MTCT and VCT were 23 times more likely to be tested than those without such knowledge. Women who had used prenatal services 2-3 times were 2.5 times more likely to be tested for HIV than those with fewer or no prenatal clinic visits [14, 20].

### *Infant feeding practices*

In northwestern Ethiopia 209 HIV-positive women participated in a study on infant feeding practices and the utilization of PMTCT services. Nurses provided information about infant feeding practices to 58.4% of these women, counselors did so for 55.5% of the respondents. Only 10.5% of these women obtained their infant feeding information from the mass media, 3.8% from their families and 2.9% from their friends and 1.9% had reportedly never been informed about this important aspect of PMTCT. Almost all (92.3%) women knew that HIV could be transmitted to the baby during pregnancy, while being born and during breast feeding. Exclusive breast feeding (EBF) was the only infant feeding option for 39.2% of these women while 10.5% used mixed (breast and formula) feeding. HIV/AIDS stigma and the desire not to make their HIV-positive status known to others, insufficient breast milk and their husbands' opposition to breast feeding or formula feeding influenced their infant feeding choices [15].

In Addis Ababa, 327 HIV-positive mothers' infant feeding practices were studied. These findings indicated that 46.8% of these mothers used exclusive replacement (formula) feeding, 30.6% relied on EBF, 15.3% used mixed feeding and 7.3% used EBF for two months and instituted replacement feeding. The most common reasons for mixed feeding included their neighbors' advice, inadequate supplies of breast milk, the husband's opposition to breast or formula feeding, illnesses of the mother and/or infant [16].

**Using ARVs for PMTCT**

Out of a cohort of 282 mothers, 232 initiated ARVs during pregnancy, 64% using AZT prophylaxis and 33% lifelong ARVs. Of those on AZT prophylaxis, 68% never missed a dose, 20% missed one dose and 12% missed more than one dose. Of those who initiated ART, 61% never missed a dose, 21% missed one dose and 18% missed more than one dose. Infants born at health facilities were more likely to get ARVs after birth than those born at home [17].

**Table 1.** Main findings of studies conducted in Ethiopia about PMTCT

Authors	Publication year	Main findings
<b>Factors affecting PMTCT service utilization</b>		
Balcha, Lecerof & Jeppsson <sup>19</sup>	2011	Human resource limitations, inadequate coordination, erratic supplies of laboratory test kits and ARV prophylactic medicines
Adedimeji, Abboud, Merdekios & Shiferaw <sup>8</sup>	2012	Stigma, inadequate monitoring and referral structures within the health facility, shortage of nurses, inadequate ARV supplies, cost of accessing the service and poor socioeconomic status of women.
Lerebo, Callens, Jackson, Zarowsky & Temmerman <sup>9</sup>	2014	Delivery at home versus at health facility, urban area residence versus rural area residence, proximity to health facility, planned pregnancy and husbands' encouragement for HCT.
<b>Client satisfaction towards PMTCT service</b>		
Ismail & Ali <sup>10</sup>	2011	Waiting time at ANC clinics averaged 39.8 minutes and for counseling (pre and post-test sessions) it was 14 minutes; 91.5% of women were satisfied with counselors' technical competencies
Asefa & Mitike <sup>11</sup>	2014	The mean waiting time to see a counselor was 24.5 minutes and 12.8 minutes were spent with their healthcare providers; 74/7% of women were satisfied with PMTCT services
<b>HIV counseling and testing among pregnant women</b>		
Moges & Amberbir <sup>12</sup>	2011	Pregnant women with high perceived susceptibility to HIV were three times more likely to accept VCT than other women
Fanta & Worku <sup>13</sup>	2012	Women with lower education levels, who were unsure about privacy and/or had 2-3 live infants were more likely to refuse VCT
Demissie, Deribew & Abera <sup>14</sup>	2009	Younger women, married women, employed women, mothers knowledgeable about HIV, MTCT and VCT and those with two or more prenatal clinic visits were more likely to be tested for HIV.
<b>Infant feeding and PMTCT</b>		
Muluye, Weldeyohannes, Gizachew & Tiruneh	2012	Stigma of HIV/AIDS, insufficient breast milk and husbands' opposition affected mothers' infant feeding options and practices.
Maru & Haidar <sup>16</sup>	2009	Exclusive replacement feeding was the most prevalent infant feeding practice by HIV positive mothers. The most common reasons for mixed feeding were the neighbours' advice, insufficient milk, husband's opposition, mothers' and/or babies' illnesses
<b>ARVs for PMTCT</b>		
Mirkuzie, Hinderaker, Sisay, Moland & Morkve <sup>17</sup>	2011	Progressive declines in medication adherence rates during PMTCT interventions. Infants who were born at health facilities were more likely to get ARVs after birth than those born at home.
Koye & Zeleke <sup>18</sup>	2013	Some women who enrolled in the PMTCT program, were using ARVs prior to their enrolment. Most HIV exposed infants received ARV prophylaxis after birth. Maternal ART adherence levels were associated with MTCT.

In Northwest Ethiopia, 509 mother-infant pairs were studied. More women were already on ART when enrolled into PMTCT intervention (f=189) as compared to those who received sdNVP+AZT for seven days (f=10), on sdNVP+AZT for four weeks (f=3), none (f=92), sdNVP (f=85) and sdNVP+AZT for seven days+3TC. Likewise 421 infants received ARV prophylaxis at birth, 72 did not receive this prophylaxis and two mothers did not know whether or not their infants had received prophylactic ARVs after birth [18].

#### 4. CONCLUSIONS

Conclusions and recommendations are based on the findings reported in the reviewed literature, relevant to PMTCT facilities, socioeconomic issues, infant feeding options and ARVs.

##### *Facilities Providing Prevention of Mother-to-Child of HIV transmission*

Collaboration between regional and local Ethiopian health care authorities must be improved and evaluated at regular intervals, especially concerning new policies and procedures, monitoring and evaluation of patients, as well as procedures for patients' referrals.

Laboratory test kits and adequate supplies of ARVs should always be available at all facilities rendering PMTCT services and internal audits should be conducted regularly.

PMTCT services should have sufficient staff to ensure that HIV-positive pregnant women and their babies receive optimum care. Stigmatization of HIV-positive patients in PMTCT, prenatal and postnatal services and in all health care services should be avoided.

Privacy must be ensured during VCT sessions to enhance patients' utilization of VCT services. Pregnant women should attend prenatal clinics regularly as from the first trimester so that they can get tested early enabling the optimal utilization of PMTCT services.

##### *Socioeconomic Issues*

The possibility of subsidizing such women's travel expenses and/or of providing mobile clinic services in selected areas could help more HIV-positive pregnant women to utilize PMTCT services.

Women with low levels of education were less likely to use VCT services. All women should understand the necessity for VCT and PMTCT. Health education packages should be compiled specifically for women with low levels of education. Knowledge is required for women to evaluate their susceptibility to HIV infection and to understand the need to use VCT services.

Younger, married, employed women who were knowledgeable about HIV, MTCT and VCT were more likely to use VCT services. Thus health education should target older, unmarried and unemployed women to increase the number of women using VCT and PMTCT services.

##### *Infant Feeding*

Although many Ethiopians reportedly received information about infant feeding from nurses, a minority had never been advised about infant feeding options. Some Ethiopian women practiced EBF or exclusive replacement feeding some also used mixed feeding. Despite costs and efforts, the PMTCT program in Ethiopia could fail to reach its objective, if the mothers do not adhere to the infant feeding recommendations.

Women's husbands/partners should also receive information about infant feeding options. Support from their husbands/partners might help mothers to persevere with the best possible infant feeding options for their circumstances.

##### *Anti-retroviral Therapy*

In Ethiopia all HIV-positive women use ARV prophylaxis or lifelong ART for PMTCT. Research reports indicated sub-optimal ART adherence levels among women using PMTCT services [20]. Appropriate health education must be provided at every clinic visit.

Infants born at home were less likely to receive ARVs than those born in hospitals/clinics. Consequently, HIV-positive women should be encouraged to give birth in health care facilities. Babies born at home should be traced and ARVs should be given by health extension workers.

Consistent evaluations of this PMTCT program's outcomes should be maintained and factors contributing to poor outcomes should be identified and addressed. These measures should enable more babies to be HIV-negative even if their mothers are HIV-positive and to enhance these HIV-positive mothers' chances of living to raise their children.

**Disclosure:** There are no conflicts of interest.

## REFERENCES

- [1]. Joint United Nations Program on HIV/AIDS. Global report on AIDS epidemic. <http://www.unaids.org>. Accessed 5 December 2012. (2012).
- [2]. Joint United Nations on HIV/AIDS. Global report on the AIDS epidemic. <http://www.unaids.org>. Accessed 24 October 2013. (2013)
- [3]. Joint United Nations Program on HIV/AIDS. Global plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive. 2011; <http://www.unaids.org>. Accessed 12 April 2012. (2011).
- [4]. World Health Organization. Towards the elimination of mother-to-child transmission of HIV. <http://www.who.int>. Accessed 07 April 2012). (2011).
- [5]. Central Statistical Agency of Ethiopia & Inner City Fund International. Ethiopia Demographic and Health Survey. <http://www.measuredhs.com/pubs/pdf/FR255/FR255.pdf>. (accessed 16 April 2012). (2011).
- [6]. Federal Ministry of Health (of Ethiopia). Country progress report on HIV/AIDS response. Addis Ababa: HIV/AIDS Prevention and Control Office. (2012).
- [7]. Federal Ministry of Health (of Ethiopia). Country progress report on HIV/AIDS response. Addis Ababa: HIV/AIDS Prevention and Control Office. (2012).
- [8]. Adedimeji A., Abboud N., Merdekios B. and Shiferaw, M. A. qualitative study of barriers to effectiveness of interventions to prevent mother to child transmission of HIV in Arba Minch. *Ethiopian International Journal of Population Research*. 2012:1-7. (2012).
- [9]. Lerebo W., Callens S., Jackson D., Zarowsky C. and Temmerman M. Identifying factors associated with the uptake of prevention of mother to child HIV transmission of programme in Tigray region, Ethiopia: a multilevel modeling approach. <http://www.biomedcentral.com/1472-6963/14/181>. Accessed 06 July 2014. (2014).
- [10]. Ismail H. and Ali A. Pregnant women's satisfaction and comprehension level of information given during HIV counseling and testing for PMTCT in public health facilities in Addis Ababa. *Ethiopian Journal of Health Development*. 25(2):126-134 (2011).
- [11]. Asefa A. and Mitike G. Prevention of mother to child transmission of HIV services in Adama town, Ethiopia: clients' satisfaction and challenges experienced by service providers. <http://www.biomedcentral.com/1471-2393/14/57>. Accessed 06 July 2014. (2014).
- [12]. Moges Z. and Amberbir A. Factors associated with readiness to VCT service utilization among pregnant women attending antenatal clinics in North Western Ethiopia: a Health Belief Model approach. *Ethiopian Journal of Health Sciences*. 21:107-115 (2011).
- [13]. Fanta W. and Worku A. Determinant for refusal of HIV testing among women attending for antenatal care in Gambela Region, Ethiopia. <http://www.reproductive-health-journal.com/content/9/1/8>. Accessed 18 January 2013. (2012)
- [14]. Demissie A., Deribew A. and Abera M. Determinants of acceptance of voluntary HIV testing among antenatal clinic attendees at Dil Chora Hospital, Diredawa, East Ethiopia. *Ethiopian Journal of Health Development*. 23(2):141-147 (2009).
- [15]. Muluye D., Weldeyohannes D., Gizachew M. and Tiruneh M. Infant feeding practice and associated factors of HIV positive mothers attending prevention of mother to child transmission and antiretroviral therapy clinics in Gondar town health institutions, Northwest Ethiopia. <http://www.biomedcentral.com/1471-2458/12/240>. Accessed 20 December 2012. (2012).
- [16]. Maru Y. and Haidar J. Infant feeding practice of HIV positive mothers and its determinants in selected health institutions of Addis Ababa, Ethiopia. *Ethiopian Journal of Health Development*. 23(2):107-114 (2009).
- [17]. Mirkuzie A.H., Hinderaker S.G., Sisay M.M., Moland M.M. and Morkve O. Current status of medication adherence and infant follow up in the prevention of mother to child HIV transmission programme in Addis Ababa. *Journal of the International AIDS Society*. 14(50):1-10 (2011).
- [18]. Koye D.N. and Zeleke B.M. Mother to child transmission of HIV and its predictors among HIV exposed infants at a PMTCT clinic in northwest Ethiopia. <http://www.biomedcentral.com/1471-2458/13/398>. Accessed 7 July 2014. (2013).

- [19]. Balcha T.T., Lecerof S.S. and Jeppsson A.R. Strategic challenges of PMTCT program implementation in Ethiopia. *Journal of the International Association of Physicians in AIDS Care*. 10(3):187-192. (2011).
- [20]. Negash T. and Ehlers V.J. Personal factors influencing patients' adherence to ART in Addis Ababa, Ethiopia. *Journal of the Association of Nurses in AIDS Care*. <http://dx.doi.org/10.1016/j.jana.2012.11.004>. Accessed 24 October 2013. (2013)