UDS International Journal of Development [UDSIJD]
Volume 4 No. 1, August, 2017
http://www.udsijd.org

KNOWLEDGE, ATTITUDES AND BARRIERS TOWARDS PREVENTION OF MOTHER-TO-CHILD TRANSMISSION OF HIV IN GHANA

S. Mariwah[1], A. Kumi-Kyereme[2], A. Tanle[2], K. Esia-Donkoh[2], S. A. Owusu[3], and K. Atuahene[4]

[1]Department of Geography and Regional Planning, University of Cape Coast
[2]Department of Population and Health, University of Cape Coast, Ghana
[3]Directorate of Research, Innovation and Consultancy (DRIC), University of Cape Coast
[4]Ghana AIDS Commission, Accra

Abstract

While awareness of HIV and AIDS is near universal in Ghana, the same cannot be said of the prevention of mother-to-child transmission (PMTCT) of the disease. This paper assesses the level of knowledge, barriers and attitudes towards PMTCT of HIV/AIDS among pregnant women, partners of pregnant women and people living with HIV (PLHIV). Data were gathered through Focus Group Discussions (FGDs) and In-Depth Interviews (IDIs) from research participants purposively selected from cities/towns of the three ecological zones in Ghana. The inclusion criteria were border towns, commercial/mining towns/cities and towns/cities that have been known for high HIV/AIDS prevalence rates. The study found that most respondents were aware of MTCT but few knew about how it can be prevented. For pregnant women, the most prominent deterring factor is the fear of being diagnosed HIV positive and the associated stigma and discrimination. Therefore, creating community awareness on behaviours necessary to prevent MTCT is an essential step to improving participation, in and adherence to, PMTCT programmes.

Keywords: Knowledge, Attitudes, PMTCT, HIV/AIDS, Ghana

Introduction

Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS) is among the leading causes of illness and death among women and children, especially in sub-Saharan Africa where infection has been found to be highest in the world (UNAIDS, 2011). According to WHO/UNAIDS/UNICEF (2011), an estimated 34 million people worldwide are infected with HIV. Out of this number, 52% are women and two-thirds (68%) live in Sub-Sahara Africa (SSA), while about 10% (3.4 million) are children under 15 years of age.

HIV prevalence among adults in Ghana was estimated to be 1.8 per cent, and women who attend Antenatal Clinic (ANC) reported a higher value of 2.9% (Ghana Aids Commission, 2010). The burden of HIV in women in Ghana has implications for mother-to-child transmission (MTCT) of the disease, since an infected HIV-infected woman can pass the virus to her baby during pregnancy, labour and delivery, or breastfeeding (Dako-Gyeke et al, 2016; Ministry of Health, 2014; Olugbenga-Bello et al, 2013). Without treatment, many babies around 15-30% born to HIV-infected mothers will become infected with HIV during pregnancy and delivery (Dako-Gyeke et al, 2016; Ministry of Health, 2014). Such high HIV infection rates have great negative impact on the socio-economic development of the country since a healthy population is needed for productive economic activities.

To avert the negative impact of HIV infections on the development of Ghana, advances have been made towards effective and affordable interventions that reduce the likelihood of a woman passing HIV on to her baby. Such interventions as outlined in the Ghana *National guidelines for prevention of mother to child transmission of HIV* of 2014 include HIV testing and counselling to all pregnant women and provision of anti-retroviral treatment to those found to be HIV positive, as well as prophylaxis and early diagnosis for the exposed infant to avert child morbidity and mortality (Ministry of Health, 2014).

However, for prevention of mother-to-child transmission (PMTCT) to be successful, every woman of childbearing age needs to be aware of HIV infection, the risks of MTCT, and the services available to reduce such risks. Meanwhile, studies on the level of knowledge regarding PMTCT among women show mixed results. Maputle and Jali (2008) found high level of awareness of HIV/AIDS, but a low level of knowledge about MTCT through breastfeeding among women in Natal, South Africa. However, Berhane and Tesfazio (2005) observed that three-quarters of Eritrean women are aware of MTCT, but only a quarter know that it can be prevented. In a related study, Hardon et al (2012) also found high level of knowledge of MTCT among women in Burkina Faso, Kenya, Malawi and Uganda. And in Nigeria, Olugbenga-Bello et al (2013) found a high level of awareness about MTCT and PMTCT of HIV, 92.1% and 91.4%, respectively, but relatively lower proportion (71.27%) of the study population having poor attitudes towards PMTCT of HIV.

The situation is not different in Ghana, with almost universal awareness of HIV/AIDS (99% for men and 98% for women), but low awareness of MTCT (Ministry of Health, 2014; GDHS, 2008). Various studies on the awareness of MTCT have shown varied findings. For example, a study by Dako-Gyeke et al (2016) reported that most women attending ANC are tested and informed about the MTCT of HIV. A similar study by Nyuzaghl et al. (2011), however, found that 80% of pregnant women in the Wa Municipality knew that a pregnant woman infected with HIV could transmit the virus to her baby. On when the HIV transmission occurs, Nyuzaghl et al. (2011) indicated that 79% of the respondents stated it occurred during pregnancy; 24% said during labour and delivery and 19% mentioned during breastfeeding.

Similar studies on the awareness of the existence of special medicine(s) introduced to prevent MTCT showed slightly varied results. While GDHS (2008) reported 54%, Nyuzaghl et al., (2011) observed that 42% of their respondents knew MTCT could be prevented, with one of the causes of the variation in knowledge and awareness being education of women. Thus, those with at least primary education were more knowledgeable about MTCT than those with no formal education. However, some socio-cultural factors and the stigma associated with HIV/AIDS might contribute to limited knowledge about MTCT and its prevention (Sprague et al., 2011; Boateng & Awunyo-Vitor, 2012). It is against this background that this paper assesses knowledge, attitudes and barriers towards PMTCT among pregnant women, partners of pregnant women and people living with HIV (PLHIV).

Study areas and methodology

Study areas

Study sites were purposively selected from the three ecological zones of Ghana. The coastal zone consists of Central, Greater Accra, Western and Volta Regions, while the forest zone comprises Ashanti, Brong Ahafo and Eastern Regions and the savannah zone covers Northern, Upper East and Upper West Regions. A total of twelve cities/towns were selected from the ecological zones (four towns in each zone). The inclusion criteria were border towns, towns/cities noted for commercial, mining, construction, and towns/cities with HIV/AIDS prevalence rates. Subsequently, Accra-Tema, Aflao, Sekondi-Takoradi and Sefwi Asafo were selected from the coastal zone; Kumasi, Obuasi, Kete Krachi and Agormanya were chosen from the forest zone, while Nadowli, Paga, Wa and Tamale were selected from the savannah zone (see Figure 1).

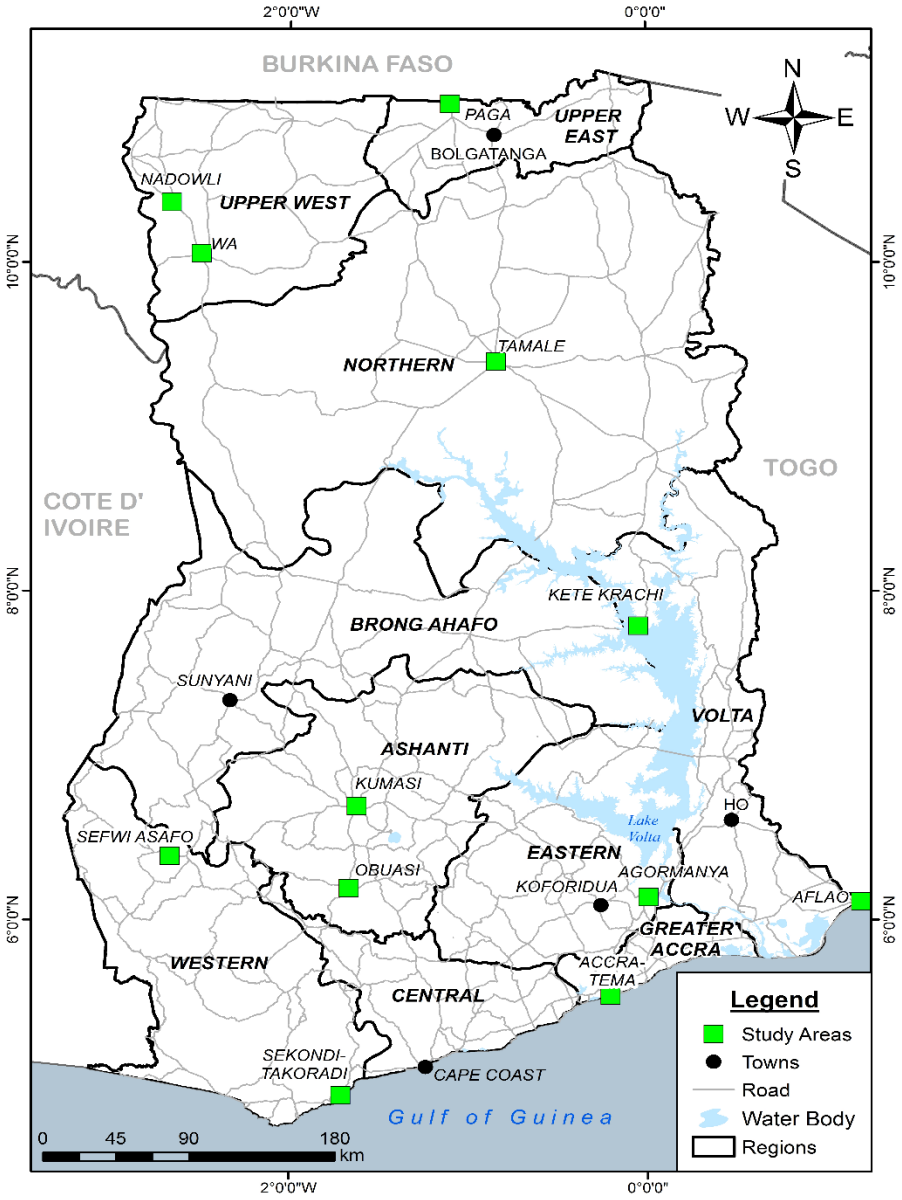

Figure 1: Map of Ghana Showing the study areas
Source: Cartography and GIS Unit, Department of Geography and Regional Planning, UCC

Study design

This research adopted a qualitative cross-sectional research methodology. This approach enabled the richness inherent in the research questions to be captured while also drawing out the similarities and differences between the case studies within and between our selected cities/towns. A participatory action research methodology helps to facilitate a collaborative approach to working with community members and ensures that the research priorities are shaped by local actors and community members, thereby addressing some of the power imbalances in conventional research (Pain, Kesby & Kindon, 2007).

Target population and Sampling procedure

The broader study targeted the following categories of people: People Living with HIV/AIDS (PLHIV)/People on Anti-retroviral drugs; In and Out of school Youth (15-24 years); Pregnant women and their partners; Religious and Traditional Leaders; Migrant workers (e.g. long distance drivers and their assistants, artisanal "galamsey" miners, construction workers, traders, cross-border migrants who are away from their regular sexual partners for at least 3 days); Female Sex Workers (FSW); and Men having sex with Men (MSM). In all, a total of 145 FGDs and 171 IDIs were conducted. However, in this paper, we utilised only the data gathered from pregnant women, partners of pregnant women and people

living with HIV (PLHIV) because the issues of PMTCT of HIV was considered more critical for this category of people.

Using purposive sampling technique, In-depth interviews (IDIs) and Focus Group Discussions (FGDs) were used to gather data from the study participants. Thus, 53 IDIs and 37 FGDs were used for this paper and Table 1 presents the distribution of respondents for the various study sites. With the permission of participants, all interviews and discussions were audio-recorded, transcribed and translated into English for coding and analysis.

Table 1: Summary of IDIs and FGDs conducted nationwide

		Summary of IDIs				**Summary of FGDs**			
		PLHIV	Pregnant Women	Partners of Pregnant Women	**Total**	PLHIV	Pregnant Women	Partners of Pregnant Women	**Total**
Zone	**Sex/Site**	M/F	F	M		M/F	F	M	
	Wa	2	2	2	**6**	1	1	-	**2**
	Tamale	2	1	1	**4**	2	1	1	**4**
	Paga	2	1	1	**4**	1	1	-	**2**
	Nadowli	2	2	2	**6**	1	1	1	**3**
Forest	Kumasi	2	1	1	**4**	2	1	1	**4**
	Obuasi	2	2	2	**6**	2	1	-	**3**
	Agomenya	2	2	1	**5**	2	1	1	**4**
	Kete- Krachi	-	2	2	**4**	-	1	1	**2**
Coastal	S'di-T'di	2	1	-	**3**	2	1	-	**3**
	Accra-Tema	2	2	-	**4**	2	1	-	**3**
	Aflao	2	2	2	**6**	2	1	1	**4**
	Sefwi Asafo	-	1	-	**1**	2	1	-	**3**
Total		20	19	14	**53**	19	12	6	**37**

Data analysis

The transcripts were reviewed and coded using Non-numerical Data Indexing Searching and Theorizing (NUDIST) version 6 (N6), through the development of a code scheme. Text searches on relevant codes were done and matrices were prepared based on the substantive points for the category of respondents. The coding framework and thematic analysis were linked to the interview/FGD topic guides, themes discussed and the theoretical approach. This enabled data to be easily read (Limb & Dwyer, 2001) and provided a cross-sectional analysis of the data from the different case study communities.

Ethical consideration

All participants provided individual informed consent by signing or thumb-printing informed consent forms. This ensured anonymity and confidentiality because HIV/AIDS is a very sensitive issue due to stigma and discrimination associated with the disease. Prior to the data analysis, all data, which could reveal personal identifiers of respondents, were deleted to ensure that the data and analysis were anonymous. Data transfer via Internet was secured with passwords. The study was approved by the Ghana Aids Commission, which sponsored the study while the Institutional Review Board of the University of Cape Coast gave ethical clearance.

Limitations

Like most studies of this nature, a few challenges were encountered in organising the FGDs. For example, efforts to organise FGDs with migrant workers and partners of pregnant women in some of the selected cities/towns proved futile. Therefore, the team had to resort to in-depth interviews as a substitute. In some cases, appropriate venue to organise the FGDs was a major challenge, especially in cities and larger towns. Most of the discussions were characterised by background noise and frequent interruptions, leading to delays in the data collection process. However, these interruptions did not affect the quality of data collected, and for that matter the quality of the entire study.

Results of the study

The findings from the study are presented under the following headings: Knowledge on prevention of mother to child transmission of HIV, Barriers to Prevention of Mother-To-Child Transmission Services, and Attitudes towards PMTCT services. Though data were gathered to reflect representation from the three ecological zones of the country, as well as different categories of respondents, the results did not vary with respect to these variables. Subsequently, the results were not presented to reflect any spatial variation in responses.

Knowledge on Prevention of Mother-To-Child Transmission

Pregnant women who are infected with HIV usually face increased risk of poor pregnancy outcomes and the possibility of transmitting the virus to their newly born babies. As such, knowledge of respondents on Prevention of Mother-to-Child Transmission (PMTCT) was investigated. On the whole, most respondents were aware of Mother-to-Child Transmission (MTCT) of HIV as revealed in the following quotes:

> *Yes the baby can be infected if the mother has it. However, if the mother is positive the doctors can give her drugs to prevent the baby from being infected.* [Pregnant woman, 23 years]

> *A baby can get HIV before birth and also through breastfeeding.* [Female, PLHIV, 45 years]

However, some other respondents had no idea about MTCT, especially during pregnancy and delivery.

> *A child cannot get it before birth but he can get it through breastfeeding or through blood contact.* [Female, PLHIV, 32 years]

> *I cannot tell if a child can get it through birth, but with breastfeeding I know the child can get because I might have sores or cuts around my nipples from which the child can pick the virus.* [Female, PLHIV, 22 years]

Although some respondents knew that HIV could be transmitted from the mother to the child, they expressed varied views on how to prevent possible infection of babies. The following excerpts from the various categories of respondents are illustrative of the level of knowledge on PMTCT.

> *Such a woman [HIV+] should see a doctor for medication to prevent the baby from picking HIV infection. Such a baby should not be breastfed.* [Female, PLHIV, 45 years]

> *What can be done for the mother is that, immediately after diagnosis, she should be counselled and put on ART so that the baby may be free from infection. Compliance to ART should continue after delivery.* [Male, PLHIV, 44 years]

The results also show that some of the respondents, especially pregnant women and their partners were not aware that PMTCT is possible. Below are some excerpts:

> *If the mother contracts HIV; it will automatically be transmitted to the unborn child, because there is blood contact when the child is in the womb.* [Pregnant woman, 23 years]

> *Once a baby is in the womb, by all means, the baby will get infected, and I don't know what can be done for them.* [Partner of pregnant woman, 32 years]

Attitudes towards PMTCT services

The effectiveness of PMTCT depends upon a woman knowing her HIV status, which is based on the availability of information, counselling and testing services (Dako-Gyeke et al., 2016). When respondents were asked to indicate whether HIV screening for pregnant women should be compulsory or voluntary, the general consensus was that it should be made compulsory. The following extracts from the IDIs and the FGDs confirm this observation:

> *I will support compulsory counselling and testing because it is through ANC that women get to know their status and invite their husbands. It is very important. I would even advocate a house-to-house screening. ... After counselling, then people are educated on HIV in small cells. In other countries, they are doing it but we don't have that in Ghana although that is very important. It can even be made compulsory. However, the results should not be released in their houses; those tested should be told to go to hospitals or to*

other health facilities for their results. [Male, PLHIV, 44 years]

Yes, some people may be infected and may not be aware. The test helps the doctors to prevent mother-to-child transmission. [Pregnant woman 29 years]

Barriers to Prevention of Mother-To-Child Transmission

Access to general health care in Ghana is noted to be a function of multiplicity of factors or barriers (Dako-Gyeke et al, 2016; Ministry of Health, 2014; Olugbenga-Bello et al, 2013). As a result, respondents were asked to mention the barriers that prevent them from accessing PMTCT services. Due to the stigma associated with HIV/AIDS, most participants mentioned the fear of being tested as HIV positive as the major barrier. The following excerpts clearly illustrate this view:

A lot of people are afraid that they will test positive, hence they will not agree to do it. Some also say if they go to the facility they will be delayed unduly while waiting for treatment. So they don't go at all. [Pregnant woman 29 years]

Some men do not feel comfortable for their pregnant wives to go to the hospital, because they are afraid that their wives will be diagnosed of HIV. [Partner of a pregnant woman, 37 years]

Because of the stigmatization and discrimination against PLHIV, people fear to access PMTCT services and even testing to know their HIV status. Some others also think it is not necessary to access PMTCT. [Female, PLHIV 32 years]

Though there are other factors, it was found that attitudes of health workers sometimes also act as a barrier to healthcare, and by extension, PMTCT in Ghana. The following excerpts from the FDGs show that attitude of some health workers served as a barrier to PMTCT services:

Some health workers are not receptive to teenagers who visit the hospital. That could be a barrier to PMTCT services. [Male, PLHIV 35 years]

The attitudes of some nurses and doctors towards pregnant women prevent the latter from accessing PMTCT services. [Male, PLHIV 31 years]

Some health workers insult pregnant women when we go for ante-natal services. This serves as a barrier to PMTCT of HIV. [Pregnant woman 28 years]

In addition, it was found that some socio-cultural beliefs (like religion) influenced people's utilisation of PMTCT services in certain communities. The major beliefs that appeared to have had some influence on PMTCT services were religious-based, as evidenced in the following quotes from the FGDs and the IDIs:

Some spiritual churches do not allow pregnant women to go to the hospital. They take care of them in prayer camps till the women deliver [Female, 28 years, PLHIV].

There are many religious beliefs that influence PMTCT – there are some religious bodies that do not allow drawing or testing of blood of *their members. Without drawing of blood, how do you test for HIV?* [Female, 45 years, PLHIV].

Discussion

This study sought to assess knowledge, attitudes and barriers towards PMTCT services in Ghana. It was done because of the fact that low levels of knowledge of PMTCT among persons living with HIV and pregnant women open windows for transmission of the virus (Boateng & Awunyo-Vitor, 2012). The results show that there is a knowledge gap, since some respondents were aware of MTCT, but others were not aware of PMTCT. This is consistent with the findings of Moses (2009) that women attending post-natal clinic in N igeria reported very high level knowledge of MTCT, but very low level of knowledge about the preventive measures. It was also found that many PLHIV and pregnant women seem to have more detailed information on MTCT and mode of preventions than the other category of respondents. This might be attributed to the fact that they have benefitted from frequent educational programmes or perhaps they have made personal

efforts to know more about HIV/AIDS and how to live with it, due to their condition.

Though most people are aware of HIV/AIDS, appropriate prevention and non-stigmatizing behaviour have been lagging behind in Ghana (Dzokoto, 2008). The finding in this study, that the fear of testing positive for HIV is a barrier to the prevention of mother-to-child transmission of HIV, is highly related to stigmatisation and discrimination associated with the disease. The fear of such prejudice and stigma causes some women to refuse testing for HIV, or even not to return for their test results. This finding corroborates that of Obermeyer-Makhlouf et al (2011) and Visser et al (2011) who assert that, among pregnant women who do take a test and are found to be HIV-positive, a good number (sometimes up to 70 percent) choose not to tell their partners due to the fear of abuse and even divorce. Meanwhile, many reports point to the beneficial effect of male partner involvement in programmes for the prevention of mother-to-child-transmission (PMTCT) of HIV in curbing paediatric HIV infections (Morfaw, 2013). Furthermore, it would be difficult for an HIV-infected mother to adhere to the infant feeding guidelines without disclosing her HIV status to her partner. As reported by Chandisarewa et al, (2007) and Visser et al (2011), routine counselling and testing, and a partner's positive view of antenatal clinical activities, appear to make it easier for pregnant women to be tested for HIV.

The most effective interventions to reduce transmission from the mother to the baby depend upon women knowing their HIV status (Dako-Gyeke et al, 2016); that, in turn, depends upon the availability of information, counselling and voluntary testing services (UNAIDS, 2001). In this study we found that most of the respondents were of the view that counselling and testing should be made compulsory for all pregnant women accessing antenatal services. The finding is in line with the Ghana national health policy, where counselling and testing have been incorporated into the ANC schedule of pregnant women, although some women may choose to opt out. Thus, inadequate knowledge and several barriers have both contributed and exacerbated the poor attitudes towards the interventions towards the prevention of MTCT in the study areas.

Conclusion and recommendations

Although most of the respondents were aware of MTCT, only few of them were aware of PMTCT. It is concluded that knowledge of MTCT of HIV is not enough, unless there is an associated awareness of the prevention of the transmission route, and its resultant behavioural change. Hence, awareness creation should focus on MTCT of HIV because such awareness will encourage people seek services to prevent MTCT.

Also, pregnant women have access to PMTCT services even though they indicated that the fear of being tested HIV positive has the potential of preventing some pregnant women from accessing PMTCT services. The general conclusion is that there is positive attitudes towards PMTCT of HIV, but the major concern is the fear of knowing their HIV status and keeping it confidential. Creating community awareness of the attempts necessary to prevent MTCT is an essential step to improving participation in, and adherence to interventions that are part of PMTCT programmes. It is therefore, recommended that Ghana Aids Commission as well as donor agency and NGOs in the fight against HIV, should engage in diversified sensitization approach which seeks to target all stakeholders in the PMTCT of HIV in order to enhance and sustain behavioural change. Although it is the women who are directly involved in adopting the recommended PMTCT behaviours, the support of male partners and elderly female household members who often affect practices associated with pregnancy and birth, is particularly important.

Acknowledgement

Data collection for the study was funded by the Ghana Aids Commission as part of a bigger study on ***Behavioural Change Communication Development Messaging for HIV/AIDS***. The authors are also grateful to Ghana Aids Commission for allowing us to use the data for this paper. However, the views expressed in this paper are solely those of the authors, and therefore take full responsibility for the content therein.

References

Berhane, A. & Tesfazio A. (2007). Knowledge and coverage of Prevention of Mother to Child Transmission (PMTCT) in Eritrea. ***Journal of Eritrean Medical Association***. 1(1): 20-23

Boateng, D. & Awunyo-Vitor, D. (2012) Knowledge, Perceptions and Practices on Antiretroviral Therapy in Farming Communities in Ghana: A Study of HIV Positive Women ***Public Health Research*****,** 2(5): 136-142

Chandisarewa, W., Stranix-Chibanda, L., Chirapa, E., Miller, A., Simoyi, M., Mahomva, A., Maldonado, Y., Shetty, A. K. (2007). Routine offer of antenatal HIV testing ("opt-out" approach) to prevent mother to child transmission of HIV in urban Zimbabwe. ***Bulletin of the World Health Organization*****,** 85:843-850.

Dako-Gyeke1, P., Dornoo, B., Ayisi Addo, S. Atuahene, M., Addo, N. A. & Yawson, A. E. (2016) Towards elimination of mother-to-child transmission of HIV in Ghana: an analysis of national programme data**.** ***International Journal for Equity in Health*** 15:5 DOI 10.1186/s12939-016-0300-5

Dzokoto, A. (2008). "National Report on the Progress of the United Nations General Assembly Special Session (UNGASS) Declaration of Commitment on HIV and AIDS", Ghana AIDS Commission.

Ghana AIDS Commission (GAC) (2010). ***Ghana's Progress Report on the United Nations General Assembly Special Session (UNGASS) Declaration of Commitment on HIV and AIDS: Reporting Period January 2008 - December 2009***, http://data.unaids.org/pub/Report/2010/ghana_2010_country_progress_report_en.pdf

Hardon, A., Vernooij, E., Bongololo-Mbera, G., Cherutich, P., Desclaux, A., Kyaddondo, D., Ky-Zerbo, O., Neuman, M., Wanyenze, R. & Obermeyer, C. (2012). Women's views on consent, counseling and confidentiality in PMTCT: a mixed-methods study in four African countries. *BMC Public Health* 2012, 12:26 http://www.biomedcentral.com/1471-2458/12/26

Limb, M. and Dwyer, C. (Eds.) (2001) ***Qualitative Methodologies for Geographers***, London: Arnold

Maputle, M.S. & Jali M.N. (2008). Pregnant women's knowledge about MTCT of HIV infection through breastfeeding. ***Curationis.*** 31(1):45-51.

Ministry of Health (2014). ***National guidelines for prevention of mother to child transmission of HIV***. Accra: Ministry of Health

Morfaw, F., Mbuagbaw, L., Thabane, L., Rodrigues, C., Wunderlich, A-P., Nana, P & Kunda, J. (2013). Male involvement in prevention programs of mother to child transmission of HIV: A systematic review to identify barriers and facilitators. ***Systematic Reviews***, 2 (5): 1-13

Moses, A.E (2009). Knowledge, attitude and practice of ante-natal attendees toward prevention of mother to child transmission (PMTCT) of HIV infection in a tertiary health facility, Northeast-Nigeria. ***The Internet Journal of Third World Medicine***. 6(2): 128-35.

Nyuzaghl, J., Ohene, S. & Odoi-Agyarko, K. (2011). Acceptability of Routine Offer of HIV Testing (Opt-Out Approach) among Pregnant Women in the Wa Municipality. ***Ghana Medical Journal*** 45(1), 10-15.

Obermeyer-Makhlouf C, Baijal P, & Pegurri, E. (2011). Facilitating HIV disclosure across diverse settings: a review. ***American Journal of Public Health***, 101(6):1011-1023.

Olugbenga-Bello, A., Adebimpe, W., Osundina, F. & Abdulsalam, S. (2013). Perception on prevention of mother-to-child-transmission (PMTCT) of HIV among women of reproductive age group in Osogbo, Southwestern Nigeria. ***International Journal of Women's Health***. 11(5): 399-405. doi: 10.2147/IJWH.S45815. Print 2013.

Pain, R., Kesby, M. & Kindon, S. (2007) Conclusion: the space(s) and scale(s) of Participatory Action Research: constructing empowering geographies? In S Kindon, R Pain and M Kesby (eds) ***Participatory action research approaches and methods: connecting people, participation and place*** (pp 225-230). London: Routledge

Sprague, C., Chersich M. F., & Black V. (2011). Health system weaknesses constrain access to PMTCT and maternal HIV services in South Africa: a qualitative enquiry. ***AIDS Res Ther.*** 8:10.

UNAIDS (2001) ***Counselling and voluntary HIV testing for pregnant women in high HIV prevalence countries: Elements and issues*** Geneva: UNAIDS.

UNAIDS (2011). ***Countdown to Zero: Global plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive 2011-2015***. Geneva: UNAIDS

Visser M, Neufeld S, de Villiers A, Makin JD, Forsyth BWC (2011). To tell or not to tell: South African women's disclosure of HIV status during pregnancy. ***AIDS Care***, 20(9): 1138-1145.

WHO/UNAIDS/UNICEF (2011) ***Global HIV/AIDS Response: Epidemic update and health sector progress towards Universal Access 2011*** Geneva