

1 *Original Research Article*

2 **Factors Associated with Access barriers to Prevention of Mother to Child**
3 **Transmission (PMTCT) of Human Immune Deficiency Virus Services in**
4 **Private Hospitals in Enugu State, South East, Nigeria.**

5
6 **ABSTRACT**

7 **Aims:** This study was to ascertain the barriers in PMTCT Services in private tertiary health
8 facilities in Enugu state, South-east Nigeria

9 **Study design:** This was a facility-based analytical cross-sectional study among HIV positive
10 nursing mothers who were accessing PMTCT services.

11 **Place and Duration of study:** The study was at Ante natal clinic and post natal Clinics of
12 Annunciation and Mother of Christ health facilities in Enugu state. The study was between
13 February and July 2015.

14 **Methodology:** Questionnaires were used. Chi-square test was used for association between
15 socio-demographic variables and experience of any access barrier. Multivariate analysis in form
16 of logistic regression was done to for determinants of experience of any access barrier. Level of
17 significance was determined at a p-value of ≤ 0.05

18 **Results:** Majority were aged 30-34 years 144(52.4%), attained secondary education 121(44.0%),
19 were unemployed 108(39.3%), and had 1-2 babies 128(46.5%). The major barriers experienced
20 were; cost of registration/transport 198(72.0%), Stigma and discrimination from
21 friends/neighbours 123(44.7%) and being too busy with household chores 137(49.8%). There
22 were statistically significant association between experience of barriers with educational level
23 ($\chi^2=8.572$, $p=0.036$) and parity ($\chi^2=6.451$, $p=0.040$)

24 **Conclusion:** Almost all the study participants in this study experienced a form of barrier with
25 major barriers. Parity and educational level influenced barriers to PMTCT care. There is need for
26 educational empowerment and family planning for the desired goals of PMTCT services to be
27 achieved.

28 **Keywords:** Access, Barriers, Private tertiary facilities, Prevention of Mother-to-child
29 transmission

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32 INTRODUCTION

33 The major routes of transmission of HIV are unsafe sex, contaminated sharp objects like
34 needles, infected blood, and transmission from an infected mother to her baby in utero (prenatal),
35 at birth (natal transmission) or afterwards through breast milk (post natal) [1]. Mother-to-child
36 transmission (MTCT) is when an HIV-infected woman passes the virus to her unborn baby. It
37 remains the major means through which children under the age of 15 years are infected with HIV
38 [2,3].

39 The majority of MTCT of HIV occur in resource-poor countries, particularly in Africa, where
40 HIV prevalence is high; and fewer than 10% of pregnant women have access to interventions
41 designed for the prevention of mother-to-child transmission (PMTCT) [4.5]. About 400,000
42 children under 15years became infected with HIV, mainly through mother-to-child transmission
43 and 90% of these MTCT infections occurred in Africa where HIV infection is beginning to
44 reverse decades of steady progress in child survival [6]. The condition is worse in sub-Saharan
45 Africa, where over 90% of the 2.1 million children living with HIV reside [7-9]. One of our best
46 opportunities for progress against AIDS lies in preventing mothers from passing on the HIV
47 virus to their children.

48 Prevention of mother to Child Transmission of HIV (PMTCT) programme is the means of
49 preventing/reducing the rate of transmission of HIV from an infected mother to her fetus or
50 newborn during pregnancy, delivery, or the postpartum period. It involves a four prong approach

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51 which includes: prevention of HIV infection among all people; prevention of unwanted
52 pregnancies among HIV-positive women; reducing the transmission of HIV during pregnancy,
53 childbirth and the postpartum period; offering care and support to HIV positive women and their
54 families [10]. The most effective means of reducing mother-to-child transmission is to provide
55 suppressive ART to the mother in order to reduce the risk of vertical transmission, sustain the
56 life and health of the mother while the child is growing up [1,11].

57 In the absence of these measures, an infant's risk of acquiring HIV from an infected mother
58 ranges from 15% to 45% but with the application of the appropriate interventions as obtained in
59 most developed countries, the rate is reduced to less than 2 per cent [2,10,12-15]. A further 5-20
60 percent will become infected through breastfeeding [7]. There are approximately 1.4 million
61 pregnant women living with HIV in low and middle income countries out of which only 26% of
62 pregnant women living in these countries received HIV test [16]. Although Anti-Retroviral
63 Therapy (ART) is available in most countries in Sub-Saharan Africa, data indicate that less than
64 10% of HIV-infected pregnant women in Sub-Saharan Africa have access to PMTCT services
65 [4]. The majority of Nigerians do not know their status and despite numerous statements of
66 political commitment, a well- defined set of interventions and the know-how required to
67 implement them, the vast majority of pregnant women in need of PMTCT services do not receive
68 them [17].

69 Several factors can increase the likelihood of MTCT such as a high viral load, the time the
70 mother got infected with the virus, or if she was re-infected during pregnancy. However, even
71 with established interventions that can reduce the risk of infection to these babies some HIV
72 infected women do not use these opportunities and such accounts for some draw backs in
73 PMTCT services. High proportion (65%) of deliveries are outside health facilities, attended by

74 un-skilled personnel (61%) or completely unassisted (20%). This grossly undermines PMTCT as
75 it leads to poor uptake despite availability of these commodities in such areas [17].

76 The public healthcare facilities at the primary, secondary and tertiary levels in Nigeria are
77 maldistributed politically. They generally lack facilities and personnel most especially at the
78 LGA level and in rural areas [18]. The private sector fills the vacuum and makes most impact in
79 the primary healthcare system. Private health facilities provided in 2009 as many as 100,000
80 patients with antiretroviral treatment (ART), which is 29 percent of the target of 350,000 and 35
81 percent of the 288,000 people on ART in Nigeria currently. Their contribution toward voluntary
82 counseling and testing is even more considerable more than the total target for Nigeria [18].

83 This study was aimed at finding out some causes of the setbacks in PMTCT Services in private
84 tertiary health facilities in Enugu state, South-east Nigeria.

85 **MATERIALS AND METHODS**

86 **Study area**

87 The study was in Enugu State, Nigeria. Enugu state is located in the southeast geopolitical zone
88 of Nigeria. Administratively Enugu state is made up of three senatorial zones, [There](#) are
89 many government health institutions and privately owned hospitals, pharmacies, laboratories as
90 well as patent medicine shops that serve as important sources of health care delivery. There are
91 approximately 700 private health facilities comprising of non-profit and profit making facilities
92 and faith-based facilities.[\[89\]](#)⁸⁹ Comprehensive PMTCT is being offered in 15 out of all health
93 facilities in the state [10 public and 5 private health facilities]. The study was conducted at the
94 selected private health facilities that offer comprehensive PMTCT services in Enugu state. The

95 | private health facilities are Annunciation ~~specialist~~Specialist Hospital and Mother of Christ
96 | specialist hospital.

97 | **Study Design.**

98 | This was a health facility-based analytical cross-sectional study to ascertain the factors
99 | influencing setbacks in PMTCT Services in private tertiary health facilities in Enugu state

100 | **Study population**

101 | It consisted of HIV positive women receiving care for PMTCT during pregnancy, childbirth and
102 | postnatal care. Additionally, women who had babies in the twelve months preceding the study
103 | and were still receiving care for PMTCT were included in the study. This is because PMTCT
104 | services are provided to mothers until 12 months after delivery, when they are either transferred
105 | to adult ART clinic if they do not become pregnant in the period or remain in the PMTCT clinic
106 | if they become pregnant.

107 | **Sample Size**

108 | The sample size was calculated using standard formula for proportions at confidence level of
109 | 95%, prevalence of access to PMTCT services in specialist health care facilities in Nigeria of
110 | 11% [2] and margin of error of 5%. This gave 165 after adding 10% wrong or incomplete
111 | responses, however 275 respondents were studied.

112 | **Sampling technique**

113 | Two (2) PMTCT health facilities were used for the study. The records of patients who had
114 | received PMTCT services in the past twelve months PMTCT services in each of the selected
115 | centres were obtained to get the sampling frame. The number of respondents selected from each

116 facility was determined proportionately based on number of PMTCT patients seen at the centre.
117 From the hospital records of January to December the previous year, the number of patients for
118 PMTCT services was 224 for Annunciation and 202 for Mother of Christ. By proportionate
119 sampling, 145 patients for Annunciation and 130 patients for Mother of Christ were studied to
120 make up 275 clients. Respondents that satisfied the inclusion criteria were recruited
121 consecutively at the facilities using pre-determined proportions till the stated number of
122 respondents were gotten.

123 **Data collection tool and methods**

124 Pre-tested, interviewer administered, semi structured questionnaire was used to collect data from
125 participants in selected health facilities. This was verbally translated to the local language (Igbo)
126 for those who could not understand English language very well. Pigeon English was also used
127 for non Igbos who could not appreciate the wordings very well. Four trained research assistants
128 were used.

129 **Data analysis**

130 Data was collected and analyzed using IBM Statistical Packages for Social Sciences (SPSS)
131 version 20. Results were summarized using percentages and presented in tables. Chi-square test
132 was used for association between socio-demographic variables and experience of any access
133 barrier. Multivariate analysis in form of logistic regression was done to for determinants of
134 experience of any access barrier. Level of significance was determined at a p-value of ≤ 0.05 .

135 **Ethical consideration**

136 Ethical clearance was obtained from the Health Research Ethics Committee of UNTH, Ituku-
137 Ozalla. Written Permission was obtained from heads of the various health facilities that were

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138 used for the study. Furthermore, written informed consent was obtained from each participant
 139 before administering the questionnaire. Information was provided to each participant on the
 140 purpose of the study, their roles and rights as participants, voluntariness, potential benefits and
 141 risks of participation. Confidentiality was ensured by non-inclusion of self-identifying
 142 characteristics in the questionnaire.

143 RESULTS

144 **Table 1: Sociodemographic characteristics of respondents**

Socio-demographic variables	Frequency (n =275)	Percent
Age		
<25	12	4.4
25-29	88	32.0
30-34	144	52.4
≥35	31	11.3
Mean ± SD	30.41 ± 3.25.	
Marital Status		
Single	18	6.5
Married till date	235	85.5
Others	22	8.0
Educational Level		
No formal education	15	5.5
Primary	41	14.9
Secondary	121	44.0
Tertiary	98	35.6
Employment status		
Unemployed	108	39.3
Trader	85	30.9
Artisan	21	7.6
Cittvil / public servant	55	20.0
Farmer	5	1.8
Religion		
Christian	259	94.2
Moslem	16	5.8
Source of income		
Husband	170	61.8
Self	56	20.4
Husband and self	46	16.7
Relatives	3	0.7

Ethnicity		
Igbo	191	69.5
Hausa	19	6.9
Yoruba	19	6.9
Others	46	16.7
Parity		
1-2	128	46.5
3-4	115	41.8
≥5	32	11.6

145

146 Table 1 shows the socio-demographic characteristics of respondents. Higher proportion were in
 147 the 30-34 age group 144 (52.4%), ~~still are~~ married 235(85.5%), attained secondary education
 148 121(44.0%), were unemployed 108(39.3%), were Christians 259(94.2%), were provided for by
 149 their husbands 170(61.8%), were Igbos 191(69.5%) and had 1-2 babies 128(46.5%).

150

151 **Table 2: Barriers influencing access to PMTCT services**

Barriers	n = 275	
	Yes	No
	n(%)	n(%)
Logistic factors		
Lack of transportation	108(39.3)	167(60.7)
Distance to health facility	66(24.5)	209(76.0)
Location of clinic	56(20.4)	219(79.6)
Cost of registration/transport	198(72.0)	77(28.0)
Long waiting time in the hospital	48(17.5)	227(82.5)
Stigma And Discrimination factors		
Stigmatization by health workers	34(12.4)	241(87.6)
Stigmatization by friends and neighbours	123(44.7)	152(55.3)
Treatment by your family members as they know you are HIV positive	66(24.0)	209(76.0)
Treatment by your community to people living with HIV/AIDS	39(14.2)	236(85.8)
Personal reasons		
Too busy with house hold chores	137(49.8)	138(50.2)
Did not understand was referred to PMTCT center	14(5.1)	261(94.9)
Lost referral letter	12(4.4)	263(95.6)
Fear of side effects of drugs	52(18.9)	223(81.1)
others*	35(12.7)	240(87.3)
Health Workers (HWs) factors		
HWs talk carelessly of our positive result	37(12.2)	238(86.5)

HWs treat us different from other women	38(13.8)	237(86.2)
HWs are unfriendly	45(16.4)	230(83.6)
HWs pass comments about us	52(18.9)	223(81.1)
HWs speak to us in degrading manner	36(13.1)	239(86.9)
HWs ignore HIV patients when they call on them in labour	23(8.4)	252(91.6)
Institutional/facility factors		
PMTCT center very far away	59(21.5)	216(78.5)
Separate from other hospitals	13(3.7)	262(95.3)
Different clinic from where other patients are seen but same hospital	38(13.8)	237(86.2)
Once you enter there everybody knows you are HIV positive	46(16.7)	229(83.3)
Overall experience of any barrier		
	259(94.2)	6(5.6)

152
153 Table 2 The major barriers due to logistic factors were; cost of registration 198[72.0%] and lack
154 of transport 108[39.3%], Institutional factors included; PMTCT being far away 59[21.5%] and
155 once you enter everyone sees you 46[16.7%], Health workersworkers' factors were; talking to
156 the clients in a degrading manner 36[13.1%] and 45[16.4%] complained they were treated in
157 unfriendly manner. Stigma and discrimination were from friends/neighbours 123[44.7%] and
158 from health workers 34[12.4%]. Some personal reasons that constituted obstacles were; being
159 too busy with household chores 137[49.8%] and feared side effects of ART drugs 52[18.9%].
160 Generally 259(94.2%) experienced at least a form of barrier.

161
162 **Table 3: Relationship between socio-demographic characteristics and experience of any of**
163 **the barriers**

Socio-demographic	Experience of barrier (n = 275)		Bivariate analysis χ^2 (p value)	Multivariate analysis AOR(95%CI)
	Yes Freq(%)	No Freq (%)		
Age				
<25	13(100.0)	0(0.0)		
25-29	86(97.7)	2(2.3)	0.658 (0.883)	NA
30-34	139(96.5)	5(3.5)		
≥ 35	30(96.5)	1(3.2)		
Marital Status				
Single	18(100.0)	0(0.0)	1.403 (0.496)	NA

Married till date	227(96.6)	8(3.4)		
Others	22(100.0)	0(0.0)		
Educational level				
No formal education	15(100.0)	0(0.0)	8.572 (0.036)	
Primary	37(90.2)	4(9.8)		0.9(0.7-11.1)
Secondary	118(97.5)	3(2.5)		0.5(0.4-6.7)
Tertiary	-	-		
Employment status				
Unemployed	106(98.1)	2(1.9)		
Trader	84(98.1)	1(1.2)	8.049 (0.154)	NA
Artisan	20(95.2)	1(4.8)		
Civil / public servant	52(94.5)	3(5.5)		
Farmer	1(100.0)	0(0.0)		
Religion				
Christian	252(97.3)	7(2.7)	0.671 (0.385)	NA
Moslem	15(93.8)	1(6.3)		
Source of income				
Husband	163(95.9)	7(4.1)	2.597 (0.458)	NA
Self	55(98.2)	1(1.8)		
Husband and self	46(100.0)	0(0.0)		
Relatives	-	-		
Ethnicity				
Igbo	184(96.3)	7(3.7)	2.707 (0.439)	NA
Hausa	18(94.7)	1(5.3)		
Yoruba	19(100.0)	0(0.0)		
Others	-	-		
Parity				
1-2	124(96.9)	4(3.1)	6.451(0.040)	
3-4	114(99.1)	1(0.9)		1.1(0.9-8.3)
≥5	29(90.0)	3(9.4)		0.9(0.7-10.8)

164

165 | Table 3 shows that there were statistically significant association between experience of
166 barriers with educational level ($\chi^2=8.572$, $p=0.036$) and parity ($\chi^2=6.451$, $p=0.040$). It also
167 shows that had primary education were about 90% times (AOR 0.9, 95% CI: 0.7-11.1) and those
168 that had secondary education 50% times (AOR 0.5, 95% CI: 0.4-6.7) times likely not to
169 experience barriers than those that had no formal education. Those whose parity were 3-4 times

170 were about 1.1 times more likely (AOR 1.1, 95% CI: 0.9-8.3) while those 5 times and above that
171 were about 90% times (AOR 0.9, 95% CI: 0.7-10.8) likely to experience barriers than those
172 whose gravidity was 1-2.

173

174 **DISCUSSION**

175 Wanting to have children is a legitimate desire of men and women in Africa, irrespective of their
176 religious beliefs. This is partly in order to give meaning to life. It is a social norm and this desire
177 cannot be suppressed by HIV infection [19]. The recent availability of PMTCT services in the
178 country has increased the desire of HIV-positive married women to have babies of their own
179 since they hope the interventions will reduce the possibility of their having an HIV-positive
180 baby. However they are confronted with some barriers. This study showed that generally almost
181 all participants experienced at least a form of barrier (94.2%). However, the major barriers
182 identified were; cost of registration, Stigma and discrimination from friends/neighbours as well
183 as being too busy with household chore.

184 Cost as a barrier is expected in private facilities because even though drugs are free in both
185 public and private facilities, other ancillary needs are subsidized in public facility which is not so
186 with private. Equally, while HIV treatment is free at the point of service, HIV patients still incur
187 substantial cost in accessing care [20]. These costs are two-fold; financial cost and opportunity
188 cost. The financial cost can be direct or indirect. Direct medical costs include payments made to
189 investigate and treat symptoms, expenditure in the event of hospitalization, purchase of drugs
190 other than HIV drugs as well as registration at facility [20,21] while indirect cost are costs like
191 transportation cost. In our study cost of registration and transport was documented as a major
192 barrier. Also transport cost has been reported in several studies as a major access barrier [22-25].

193 In a study in South East Nigeria, it was found that transportation cost was one of the reasons for
194 not seeking health care in a health facility [22]. Similarly studies identified issues affecting
195 access to PMTCT treatment for mothers and infants as distance to facilities, frequency of visits
196 required and long waiting time in the hospital [23-25].

197 Other form of cost always over looked but faced in course of accessing care is the Opportunity
198 cost. It is value of the alternative actions foregone by the individual in order to access care [26].
199 For one to get to a HIV clinic for treatment some trade-offs are often made. This might be in
200 terms of work, school, business or domestic chores [26]. This featured in this study as personal
201 reasons that constituted obstacles and about half reported that being too busy with household
202 chores was a barrier.

203 Stigma and discrimination is a major problem often faced by people living with HIV/AIDS in
204 developing countries, including Nigeria [1]. It constitutes one of the greatest barriers to
205 effectively combating HIV pandemic. People with HIV infection are stigmatized because of the
206 widely held belief that it is associated with behaviours considered socially unacceptable by many
207 persons. People fail to undergo testing due to fear of discrimination and stigma and even when
208 they undergo, some fail to disclose their status for the same reason. Some HIV patients have
209 been thrown out of jobs and homes, rejected by family and friends while some have even been
210 killed by their relatives or by themselves instead of continuing to face ordeals they are subjected
211 to [1]. The highest form of stigma and discrimination experienced by respondents from this
212 study was stigmatization by friends and neighbors. Imagine the people that should serve as
213 succor being perpetrators of the same act. HIV-positive women require emotional and moral
214 support from health workers because majority does not get it any other place even at home.

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Comment [Admin4]: Add relevant literature here because this sentence

215 | Findings from studies in South Africa [27] Tanzania [28] and Kenya [29]—~~show~~ show that
216 | stigma regarding HIV status and fear of disclosure to partners or family members (particularly
217 | grandmothers or mothers-in-law) were major barriers to uptake of PMTCT ARV interventions
218 | Study in Lagos, Nigeria equally found that 69.2% of their respondents said that they would be
219 | discriminated against socially and/or culturally if they tested HIV positive [28].
220 | ~~However~~However, in the same study, few of the respondents indicated that people living with
221 | HIV/AIDS were accepted and supported in their community. The challenge of rejection and fear
222 | of being avoided was still widespread in the community. The International Centre for Research
223 | on Women in their study in Botswana and Zambia found that HIV/AIDS-related stigma and
224 | discrimination create circumstances that fuel the spread of HIV [29]. The gravity of stigma is so
225 | much that many patient prefer to bear the cost of transportation to access services in facilities far
226 | away from their abode than put themselves in a situation of being recognized and the news of
227 | their status spread.

228 | The findings from this study show that those whose parity were more than 2 were more likely to
229 | experience barriers than those whose parity were 2 and below. This is in line with other studies
230 | which documented that being married, increasing age and increasing year were independently
231 | associated with access to PMTCT services [2,24]. Equally those that had primary and secondary
232 | education were likely not to experience barriers than those that had no formal education. This
233 | can be partly explained by empowerment associated with education. The more educated ones are
234 | likely to appreciate the jingles, promotions and teachings about HIV thereby making them
235 | appreciate that their condition and also understand that PMTCT is only way for productive lives
236 | in their family. This possible explanation is also in line with the finding from China and Addis

237 Ababa, Ethiopia where women having secondary and above education level were found to have
238 better knowledge on MTCT and PMTCT of HIV than those with no education [30,31].

239 Other identified barriers from other studies include; lack of available, accessible, acceptable, and
240 affordable resources negatively influence decisions and actions towards PMTCT. Family
241 contexts matter with decisions and actions towards PMTCT service uptake in Nigeria
242 particularly with disclosure and non-disclosure of sero-positive status, fertility intentions and
243 infant feeding choices [23-25].

244 **CONCLUSION**

245 Almost all of the study participants in this study experienced a form of barrier. The major
246 barriers identified were; cost of registration, Stigma and discrimination from friends/neighbours
247 as well as being too busy with household chores. Parity and educational level influenced barriers
248 to PMTCT ~~care~~-care. There is need for educational empowerment and family planning for the
249 desired goals of PMTCT services to be achieved. Individuals, government, NGOs and other
250 agencies should lend hand in funding HIV and PMTCT services so that everything about it
251 should be free.

252 **CONFLICT OF INTEREST**

253 All authors declare no conflict of interest

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255 **REFERENCES**

- 256 1. Arulogun OS, Adewole IF, Alli OL, Adesina AO. Community Gate Keepers' awareness
257 and perception of prevention of mother-to-child transmission of HIV services in Ibadan,
258 Nigeria. Afr J Reprod Health. 2007 ;11(1):67-75.

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304
2. Nkwo P. Prevention of mother to child transmission of Human Immunodeficiency Virus: The Nigerian perspective. *Ann Med Health Sci Res.* 2012; 2:56-65.
 3. Newell M L. Prevention of mother-to-child transmission of HIV: challenges for the current decade. www.sciencedirect.com/science/article/pii/S1025984816000065
 4. Auxilia M, Winfreda C, Keatinge J, Lynda SC, Godfrey W, Elizabeth M et al. Factors associated with access to HIV care and treatment in a prevention of mother to child transmission programme in urban Zimbabwe. *Journal of International AIDS Society.* 2010; 13:38.n
 5. UNAIDS. Report on the global HIV/AIDS epidemic: 4th global report: 2004. Available at <http://www.unaids.org>
 6. Onoja AJ, Shehu MB, Abu GA, Odama L, Inyang US, Nasidi A. Prevention of Mother-to-Child Transmission (PMTCT) 2011 Fact Sheet. Baseline HIV-1 prevalence among various at risk group in Nigeria: International AIDS conference Bangkok Book of abstract 2004: 116.
 7. Joint United Nations programme on HIV/AIDS. Report on the Global HIV/AIDS Epidemic. Geneva: UNAIDS; 2010. Available at <http://www.unaids.org>
 8. Federal Ministry of Health. Technical Report on National HIV Sero-Prevalence Sentinel Survey. 2010.
 9. UNAIDS. World AIDS Day Report 2012 Available at <http://www.unaids.org>.
 10. *European Collaborative Study: "Mother-to-child transmission of HIV in the era of highly active antiretroviral therapy". Clinical Infectious Diseases.* 2005; 40(3):458-46
 11. Lala MM, Rashid HM. Vertical Transmission of HIV. *The Indian Journal of Pediatrics,* 2010, Volume 77, Number 11, Page 1270
 12. UNAIDS World AIDS Day Report, 2011. Available at <http://www.unaids.org>
 13. Federal Ministry of Health. National HIV/AIDS and Reproductive Health Survey 2008. Abuja. Nigeria.
 14. Joint United Nations Programme on HIV/AIDS (UNAIDS) and World Health Organization (WHO). AIDS epidemic update: November 2009. "UNAIDS/09.36E / JC1700E". Accessed 8/5/2011
 15. Coovadia BN. Antiretroviral agents-how best to protect infants from HIV and save their mothers from AIDS. *N. Engl. J. Med.* 2009; 351(3):289-292.

- 305 16. World Health Organization, Joint United Nations Programs on HIV/AIDS, United
306 Nations Children's Fund. Towards universal access: scaling up priority HIV/AIDS
307 interventions in the health sector: 2008 progress report. World Health Organization; 2008.
308 Available at www.who.int/hiv
309
- 310 17. FMOH. National Guidelines on implementation of PMTCT; HIV/AIDS in Nigeria 2012;
311 Abuja, Nigeria
312
- 313 18. Uzochukwu BSC, Onwujekwe OE, Soludo E, Nkoli E, Uguru NP. The District Health
314 System in Enugu State, Nigeria: An analysis of policy development and implementation
315 CREHS research report, May 2009
316
- 317 19. Olugbenga- Bello AI, Adebimpe WO, Osundina FF, and Abdulsalam ST .Perception On
318 Prevention Of Mother-To-Child-Transmission (PMTCT) Of HIV Among Women Of
319 Reproductive Age Group In Osogbo, Southwestern Nigeria. International Journal of
320 Women's Health Volume 2013;5 :399 – 405.
321
- 322 20. Mauch V, Woods N, Kirubi B, Kipruto H, Sitienei J, E Klinkenberg. Assessing access
323 barriers to tuberculosis care with the tool to Estimate Patients' Costs: pilot results from
324 two districts in Kenya. BMC Public Health 2011; 11:43
325
- 326 21. Wyss K, Kilima P, Lorenz N. Costs of tuberculosis for households and health care
327 providers in Dar es Salaam. Tanzania Tropical Medicine & International Health. 2001;
328 6(1): 60-68
329
- 330 22. Onwujekwe O, Onoka C, Uzochukwu B, Hanson K.. Constraints to universal coverage:
331 inequities in health service use and expenditures for different health conditions and
332 providers. International Journal for Equity. 2011;10(50).
333
- 334 23. Painter TM, Diaby KL, Matia DM, Lin LS, Sibailly TS, Kouassi MK, et al. Women's
335 reasons for not participating in follow up visits before starting short course antiretroviral
336 prophylaxis for prevention of mother to child transmission of HIV: qualitative interview
337 study. Br Med J. 2004;329(7465):543–6
338
- 339 24. Chinkonde JR, Sundby J, Martinson F. The prevention of mother-to-child HIV
340 transmission programme in Lilongwe, Malawi: why do so many women drop out. Reprod
341 Health Matters. 2009;17(33):143–51
342
- 343 25. Theilgaard ZP, Katzenstein TL, Chiduo MG, Pahl C, Bygbjerg IC, Gerstoft J, et al.
344 Addressing the fear and consequences of stigmatization – a necessary step towards
345 making HAART accessible to women in Tanzania: a qualitative study. AIDS Res Ther.
346 2011;8:28
347
- 348 26. Witter S, Ensor T, Jowett M, Thompson R. Health economics for developing countries A
349 practical guide 2nd Edition Macmillian, Oxford 2000

- 350
351 27. WHO. The world health Report 2005. <http://www.who.int/hivAssessed> 26/11/2011.
352
- 353 28. Federal Ministry of Health, Nigeria. National HIV/AIDS and Reproductive Health
354 Survey, 2005. Abuja: Federal Ministry of Health
355
- 356 29. International Centre for Research on Women (ICRW). Addressing HIV-related stigma
357 and resulting discrimination in Africa: A three-country study in Ethiopia, Tanzania and
358 Zambia. Information bulletin. International Centre for Research on Women:
359 Washington, DC. 2002.
360
- 361 30. Choi Fung H. HIV/AIDS and risk behaviors in Hong Kong Chinese pregnant women. J
362 Adv Nurs. 2003;43(3):238–245. doi: 10.1046/j.1365-
363 2648.2003.02706.x. [[PubMed](#)] [[Cross Ref](#)]
364
- 365 31. Solomon J, Tilahun T. knowledge and attitude towards mother to child transmission of
366 HIV and its prevention among postnatal mothers in Tikur Anbessa and zewditu Memorial
367 Hospitals Addis Ababa. Ethiop J Health Dev. 2005;19(3):211–218
368
369
370

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