Prevalence and Factors Associated with HIV Status Disclosure among Pregnant and Lactating Women on Antiretroviral Treatment after Rollout of Option B Plus in Urban Moshi Tanzania

Martha Oshosen[1], Amon Sabasaba[1], James Samwel Ngocho[1,2,*] and Blandina Theophil Mmbaga[2,3,4]

[1]*Institute of Public Health Kilimanjaro Christian Medical University College, Box 2240 Moshi-Tanzania*

[2]*Kilimanjaro Christian Medical Centre-Duke University Collaboration Clinical Research Site, Box 3010 Moshi-Tanzania*

[3]*Department of Pediatrics and Child Health, Kilimanjaro Christian Medical Centre, Box 3010 Moshi, Tanzania*

[4]*Kilimanjaro Clinical Research Institute, Box 2236 Moshi Tanzania*

Abstract: *Objective:* At the first antenatal visit, HIV counseling and testing are offered to all pregnant women in Tanzania. HIV-infected women are encouraged to disclose their status to the partner. The objective of this study was to determine prevalence and factors associated with HIV status disclosure among pregnant and lactating women on antiretroviral therapy after rollout of Option B plus in urban Moshi.

Methodology: A cross-sectional study was conducted from June to August 2015. Participants were recruited from 4 health facilities in urban Moshi. All HIV-infected women aged 18 years and above attending Prevention of Mother to Child Transmission (PMTCT) clinic were invited to participate. However, pregnant women who receive their test results on the day of enrollment were excluded. The interviews were conducted in Kiswahili language using an interview schedule.

Results: A total of 167 HIV-positive pregnant and lactating women were enrolled in this study. Overall, the prevalence of HIV status disclosure was 74.9%. Most women were married 121 (72.5%) and had primary education 96 (57.5%). Factors that were significantly associated with HIV status disclosure to partner are disclosure counselling (APR=2.11; 95% IC: 1.58-2.84), knowing partner's HIV status (APR=2.16; 95% CI: 1.61- 2.90) and living together with their partner (APR=2.17; 95% IC: 1.61-3.03).

Conclusion: There was a high prevalence of HIV status disclosure to partner. Knowing partner's status was significantly associated with disclosure. Partner involvement and disclosure counseling is key in HIV disclosure.

Keywords: Disclosure to partner, prevention of mother to child transmission, HIV status, factors, Tanzania.

1. INTRODUCTION

Globally, by the end of 2012, an estimated 35.3 million people were living with HIV, of which 70% of them were living in Sub-Saharan Africa [1]. In Tanzania, an estimated 1.4 to 1.6 million were living with HIV in 2012 and the prevalence of HIV among women attending antenatal clinic was 6.9% [2]. About 2.3 million children less than 15 years are living with HIV/AIDS of which majority are living in Sub-Saharan Africa. Without any intervention estimated 35% of children born to HIV-infected mothers are at a risk of being infected with the virus. This can be reduced to below 5% with the implementation of mother to child transmission of HIV (PMTCT) [3].

Tanzania has been adopting the WHO guideline for prevention of mother to child transmission since 2000 and the guideline has been changing due to the recommendation on ARV's treatment or prophylaxis options available and breasting feeding options. In 2012, Tanzania adopted the global plan of eliminating mother to child transmission of HIV (eMTCT) [4]. The goal was to reduce the transmission from 25.0% in 2010 to 4.0% by 2015. In addition, in 2013 Tanzania adopted the WHO recommendation of providing life-long antiretroviral therapy for all pregnant and lactation women regardless of WHO clinical stage or CD4 count and children Nevirapine prophylaxis for 6 weeks (Option B plus) . By the end of 2014, the Tanzania had achieved a countrywide roll-out of Option B plus [5].

Antenatal HIV counseling and testing are offered to all pregnant women in Tanzania at first clinic visit. Women who test positive are encouraged to disclose their HIV status to their partner. Disclosure is key in the prevention of transmission of HIV to partners especially for discordant couples and to the unborn children. Some of the associated positive outcomes of the disclosure are good adherence to PMTCT services, social support, and exploring the available infant

*Address correspondence to this author at the Institute of Public Health Kilimanjaro Christian Medical University College, Box 2240 Moshi-Tanzania; Tel: +255784640164; Fax: +25527275351;
E-mail: jamesngocho08@gmail.com

E-ISSN: 2313-0946/16

feeding options [6, 7]. In order to maximize the available PMTCT services, the disclosure of HIV status should be encouraged during antenatal (ANC) counseling and testing [8]. Women who have disclosed their HIV status to their partner is more likely adhere to PMTCT services [9], with regular clinic visits, regular drug refill and with good drug ARV adherence, unlikely to develop depression or stress and most of them practice protected sex [10].

Disclosure of HIV-positive status among women has both positive and negative consequences in motivating or discouraging women for Voluntary Counseling and Testing (VCT) with their partners [11]. The fear of negative consequences can itself be a reason for non-disclosure [8, 12]. Perceived and enacted stigma and discrimination plus physical violence [9], and being blamed for bringing the disease to the family [13, 14]. Also, fears of abandonment and denied socio-economic support [8, 15]. According to Kiula, level of education and financial dependency were important factors predicting HIV status disclosure [16]. Strong and transparent relationship among couples influences early disclosure to a partner [14].

Studies have shown variation in prevalence of HIV status disclosure among pregnant and lactating women. In a recent systematic review of HIV status disclosure among pregnant and postpartum women in Sub-Saharan Africa the rate was found to be 67% (ranging from 5 to 96.7%) [17]. A high prevalence of disclosure to a partner was reported in Uganda (83.8%), Nigeria (94.4%) and Ethiopia (73.0%) [7, 8, 14]. While in Kenya, Nigeria, and Ivory Coast the prevalence was 50.0% and 50.9% respectively [12, 18, 19]. In Tanzania, studies have reported a low prevalence of disclosure to partner ranging between 17 and 41% [9, 16, 20].

PMTCT program has been well adopted in Tanzania and Kilimanjaro region as well, however, there is no published data on the prevalence and factors associated with disclosure among HIV-infected women post rollout of option B plus. This study aimed at determining prevalence and factors associated with disclosure in the context of option B plus. Understanding the barriers to the disclosure of HIV to partners will help to identify ways to support and plan for partner involvement into PMTCT care and therefore enhance disclosure and acceleration of elimination of mother to child transmission.

2. METHODS

2.1. Study Area and Data Collection

Urban Moshi is one of the seven districts in the Kilimanjaro region of Tanzania (Figure **1**). According to the 2012 population census, the district had 184,292 people, with 89,174 males, 95,118 females [21]. The prevalence of HIV among women attending the antenatal clinic in the municipality is 6.0% [22].

Tanzania is among countries which are implementing Option B plus policy; under Option B plus all HIV-positive pregnant women are initiated antiretroviral (ARV) drugs regardless of their CD4 counts and or WHO clinical staging. Women are expected to continue with ARV for the rest of their lives. Whereby, exposed infants use Nevirapine syrup for six weeks only. With the exception of women with known

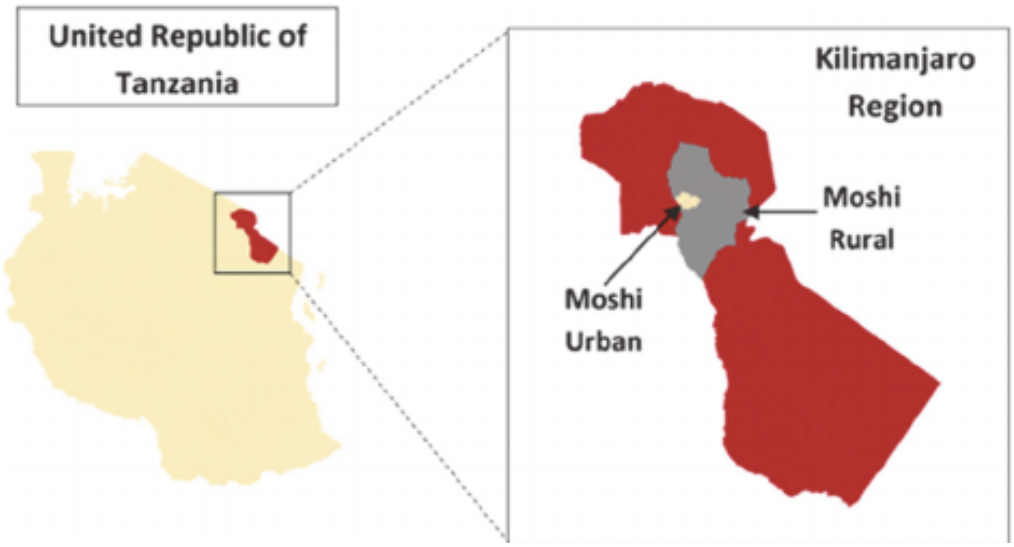

Figure 1: Map of Tanzania showing Kilimanjaro region and Moshi urban (Research Gate).

HIV-positive status, those attending the antenatal clinic for the first time are tested for HIV infection. If the test result is positive, the client is advised to bring their partner at the next visit. Also, they are counseled on the importance of disclosing and also they are encouraged to disclose their HIV status to the partner or close relative. The counseling process continues at each clinic visit for those who have not disclosed their status. For those who have disclosed to partner, are asked to bring the partner for counselling and testing of HIV if their status is unknown.

Clients were screened from Pasua and Majengo health Centers, St. Joseph district designated district hospital and Kilimanjaro Christian Medical Centre referral hospital (KCMC). These clinics were selected based on a high number of women attending ANC and hence higher number of HIV-infected women under PMTCT program and catered across all level of health care services where PMTCT program is provided. According to the program, women are seen on a monthly basis for drug refill and evaluations. Within two month period (May and June 2015), about 200 clients visited the study area. Those aged 18 years and above were invited to participate in the study. Of which 167 signed consent, with a response rate of 92.5% (Figure **2**).

A face to face interview was conducted in Kiswahili language using an interview schedule to collect information on demographic, socio-economic factors and HIV status disclosure. The interviews were conducted by investigators with the help of a trained nurse. The data collection tool was pretested for validity and reliability and necessary changes were made before the commencement of data collection.

2.2. Measures

The outcome variable in this study was HIV status disclosure. The disclosure was defined as sharing of the HIV status with the husband or current partner. Participants were asked if they have ever disclosed their HIV status to the current sexual pattern or husband. Independent variables collected included socio-demographic characteristic; participant age, participant and partner's occupation, participant and partners level of education, marital status, religion, clinic attending and gravidity. Socio-economic variables measured as dependence on the partner for income or have self-monthly income. Also the health system factor such as HIV status disclosure counselling was measured. They were asked if they ever received counseling about the importance and the process of disclosing their HIV status to the partner.

2.3. Data Analysis

Data analysis was done by using Statistical Package for Social sciences (SPSS) version 22, where descriptive statistics were calculated and summarized in frequency tables and cross tabulations. A chi-

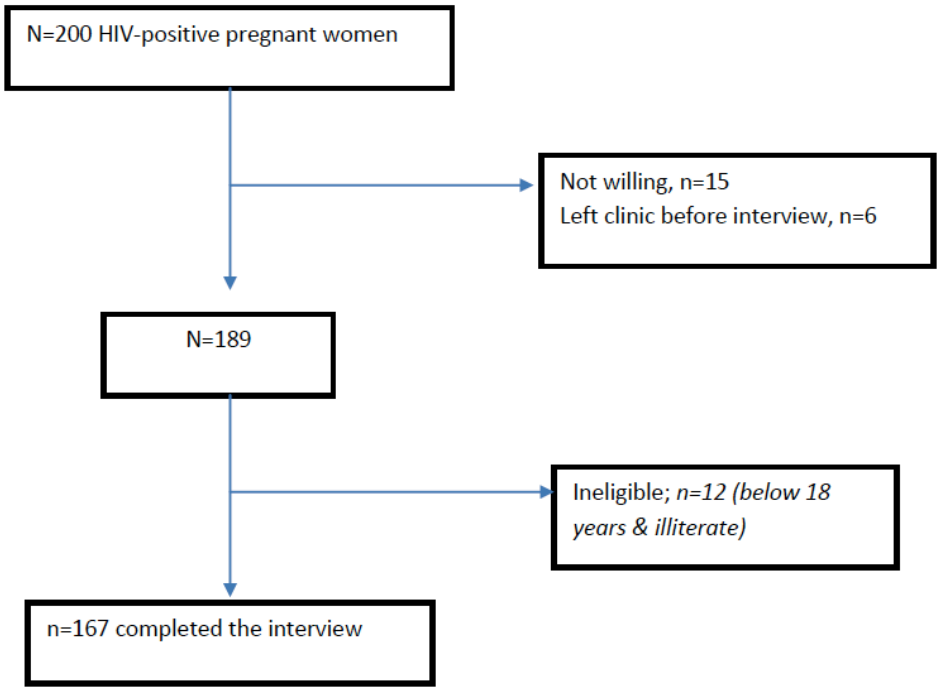

Figure 2: Recruitment flow chart.

squared test was used to test for the association between categorical variables. All tests were two-sided with P values ≤ 0.05 regarded as statistically significant. A log-binomial regression analysis was applied to predict factors associated with HIV status disclosure. Since disclosure was considered common (prevalence>10.0%), Prevalence Ratio and their 95% Confidence Intervals were estimated.

Table 1: Socio-Demographic Characteristic of Study Participants (n=167)

Variable	N	%
Health facility		
KCMC	82	49.1
Pasua	24	14.4
Majengo	56	33.5
St. Joseph	5	3.0
Age (years)		
20-30	69	41.3
30-42	98	58.7
Mean age (±SD)	31 (±5.1)	
Marital status		
Married/cohabiting	121	72.5
Single	46	27.5
Education level		
None	3	1.8
Primary education	96	57.5
Secondary	48	28.7
Higher education	20	12.0
Partners education		
Primary education	81	48.5
Secondary	62	37.1
Higher education	24	14.4
Partners occupation		
Self-employed/business	86	52.7
Formally employed	77	47.2
Religion		
Christian	125	74.8
Muslim	42	25.2
Monthly income (Tshs)*		
None	44	26.3
<100,000	86	51.5
>100,000	37	22.2
Gravida		
Prime gravida	37	22.2
Multigravida	130	77.8
Currently living together with partner		
Yes	107	64.1
No	60	35.9

*Exchange rate 1US$ = 2,000 Tshs in 2015.

2.4. Ethical Consideration

The study was approval by the Kilimanjaro Christian Medical College Research Ethics Committee. The permission to conduct this study was sought from KCMC hospital director and medical officer in charge of Majengo, Pasua, and St. Joseph hospital. Clients were asked to sign an informed consent before their participation. To maintain confidentiality participant names were not used instead a unique identifier was used.

3. RESULTS

Overall, a total of 167 pregnant and lactating HIV-infected women were enrolled in this study. About half 81 (49.1%) of participants were from KCMC referral hospital. Their age ranged from 20 to 40 years with the mean age (±SD) of 31 (±5.1) years. The majority of participants 121 (72.5%) were married or cohabiting and 107 (64.1%) were living together with their partners (Table **1**). A large proportion of women were Christians 125 (74.8%), 96 (57.5%) had primary education, 86 (51.5%) had monthly income less than 100,000 TShillings and only 37 (22.2%) women involved in this study were prime gravidae.

Of the 167 enrolled participants, the majority of had disclosed their HIV status to their partners 74.9% (125/167). Living together with the partner was significantly associated with HIV status disclosure ($p<0.0001$) and knowing partner's HIV status ($p<0.0001$), (Table **2**). Counseling on disclosure was significantly associated with HIV status disclosure among women ($p<0.001$). Other factors that were significantly associated with HIV status disclosure were marital status and level of dependency to the partner ($p<0.05$).

Only 3 factors remained significant predictors of HIV status disclosure in the multivariate (Table **3**). The prevalence ratio of disclosing HIV status was 2 times higher among women who were counselled as compared to those who were not counselled (APR=2.11; 95% IC: 1.58-2.84). Women who knew their partner's HIV status were 2 times likely to disclose their HIV status compared to women who were not aware of their partner status (APR=2.16; 95% CI: 1.61-2.90). In addition, those living together with their partner were 2 times likely to disclose their HIV status compared to those who are not living with their partner (APR=2.17; 95% IC: 1.61-3.03).

Table 2: Univariate Analysis of Factor Associated with HIV Status Disclosure to Partner (n=167)

Variable	n	Disclosed n (%)	Not Disclosed n (%)	p-Value*
Age (Years)				
≤30	69	56 (81.2)	13 (18.8)	2.48 (0.115)
>30	98	69 (70.4)	29 (29.6)	
Marital status				
Married	104	87 (83.7)	17 (16.3)	14.5 (0.006)
Single	41	24 (58.5)	17 (41.5)	
Cohabiting	17	12 (70.6)	5 (29.4)	
Level of education				
None	3	2 (66.7)	1 (33.3)	1.33 (0.72)
Primary education	96	25 (26)	71 (74)	
Secondary	48	13 (27.1)	35 (72.9)	
Higher education	20	3 (15)	17 (85)	
Religion				
Christian	125	94 (75.2)	31 (24.8)	0.03 (0.857)
Muslim	42	31 (73.8)	11 (26.2)	
Dependency on partner income				
Yes	44	39(88.6)	5 (11.4)	6.03 (0.014)
No	123	86(69.9)	37 (30.1)	
Partner's education				
Primary education	81	62(76.5)	19 (23.5)	0.86 (0.651)
Some secondary	62	44 (71.0)	18 (29.0)	
Higher education	24	19 (79.2)	5 (20.8)	
Partner's occupation				
Self-employed/business	86	62 (72.1)	24 (27.9)	1.11 (0.291)
Formally employed	77	61(79.2)	16(20.8)	
Living with partner				
Yes	107	93(86.9)	14(13.1)	23.03 (<0.0001)
No	60	32(53.3)	28(46.7)	
Role of counselor				
Yes	47	24(51.1)	23(48.9)	19.7 (<0.0001)
No	120	101(84.2)	19(15.8)	
Knowing partners status				
Yes	97	90(92.8)	7(7.2)	39.5 (<0.0001)
No	70	35(50)	35(50)	

* Chi-squared p-value for linear trend.

Table 3: Multivariate Analysis of Factors Associated with HIV Status Disclosure

Variable	Crude PR (95% CI)	Adjusted PR* (95% C.I)
Marital Status		
Married	1	1
Single	0.70 (0.53-0.92)	1.03 (0.92-1.16)
Cohabiting	0.84 (0.61-1.16)	0.92 (0.76-1.10)
Living with parents	0.60 (0.22-1.60)	1.72 (0.92-3.22)
Level of dependency		
Independent to the partner	1	1
Dependent	0.69 (0.61-0.77)	0.98 (0.95-1.01)
Living together		
No	1	1
Yes	1.8 (1.49-2.38)	2.17 (1.61-3.03)
Counselled		
No	1	1
Yes	1.64 (1.23-2.20)	2.11 (1.58-2.84)
Knowing partners status		
Yes	1.86 (1.46-2.36)	2.16 (1.61- 2.90)
No	1	1

*Adjusted for the effect of living style and knowing partner's status, marital status PR is prevalence ratio.

4. DISCUSSION

The prevalence of HIV status disclosure to a partner was high (74.9%), compared to previously reported prevalence in Tanzania in Morogoro, Dar es Salaam and Mwanza, 41.0%, 17-21% and 25.4%, respectively [9, 16, 20]. However, similar prevalence of HIV status disclosure to partner was reported from Ethiopia (73.0%) and Uganda (83.8%) [7, 14]. The high proportion of disclosure is an indication of the success of PMTCT program [16]. Women who have not disclosed their status should be counseled and encouraged to disclose their status to the partner. This will help in fueling effort of eliminating mother to child transmission of HIV. Mothers who fail to disclose are faced with many challenges such as poor ART adherence and lack of decision on infant feeding choice [23], which impact the benefit of PMTCT services [24].

Discussing HIV testing with the partner prior to and testing together increases the likely hood of HIV status disclosure [7, 12, 25]. Women who knew their partner's HIV status were more likely to disclose their status. A partner who knows his status can encourage his wife to test and with that support the possibility of disclosing becomes high. However, in this study almost half (41.9%) of women did not know their partner HIV status, compared with 44.6% in Nigeria [12]. Studies from Tanzania and Ethiopia have reported a similar association between disclosure and knowing partner HIV status [11, 16]. More effort needs to encourage men to accompany their wives for clinic visit especially the first antenatal booking so that they can be counseled and tested together.

The role of the counseling was found to have a significant association with HIV status disclosure to a partner; a similar finding was reported in a study from North Nigeria [8]. Similarly in Ethiopia, counseled women were almost 17 times more likely to disclose to their partner [11]. Ongoing counseling at each clinic appointment and during drug refill should be encouraged; the healthcare provider should continue to encourage women disclosed their status to a partner or a trusted relative.

Living together with the partner was significantly associated with HIV status disclosure to a partner in this study. Women living with their partner were likely to disclose their status, whereby in this study 64.1% of participants were living together with their partner. These women face the need support from their partner in taking care of their child but also the health of the mother, however, some women are physical abuse and face many other negative outcomes upon disclosure [3, 9, 26]. However, living together without disclosing has a negative impact woman health and also to the PMTCT program.

5. STUDY LIMITATIONS

Duration of HIV diagnosis to the time of disclosure was not assessed as well as the time a woman has been followed up by PMTCT care. This might have an impact on the duration of contact of contact with counselor, counseling and disclosure status. This was a cross-sectional study; the long-term impact of disclosure was not assessed.

CONCLUSION AND RECOMMENDATION

The proportion of HIV status disclosure to partner in this study was high. Knowing partner's status, the HIV status disclosure counselling, and living in the same house were significantly associated with disclosure to partner.

Counseling and encouraging disclosure should be an ongoing process in PMTCT clinics and partner involvement in supporting ANC attendance should be encouraged as may help in increasing rate of disclosure. Research directed in assessing the long-term impact of HIV disclosure to the partner might be help in strengthening disclosure strategies. There is a need for a qualitative study to gain an in-depth understanding of factors associated with non-discourse since a quarter of participants never disclosed their status.

REFERENCES

[1] Unaids. Global Report: Unaids report on the global AIDS epidemic 2013. Unaids Geneva, Swatzerland 2013; 198.

[2] Ministry of Health and Social Welfare, United Republic of Tanzania. HIV / AIDS / STI Surveillance Report Report Number 22. Dar es Salaam 2011; (22).

[3] Medley A, Garcia-Moreno C, McGill S and Maman S. Rates, Barriers and Outcomes of HIV Serostatus Disclosure among Women in Developing Countries: Implications for Prevention of Mother-to-child Transmission Programmes. Bull World Health Organ. 2004; 82(4): 299-307.

[4] Ministry of Health and Social Welfare, United Republic of Tanzania Mainland. Tanzania Elimination of Mother to Child Transmission of HIV plan, 2012-2015. Dar es Salaam 2011.

[5] Ministry of Health and Social Welfare, United Republic of Tanzania Mainland. National Guidelines for Comprehensive Care Services for Prevention of Mother-toMChild Transmission of HIV and Keeping mothers Alive. Dar es Salaam 2013.

[6] Madiba S and Letsoalo R. HIV Disclosure to Partners and Family among Women Enrolled in Prevention of Mother to Child Transmission of HIV Program: Implications for Infant Feeding in Poor Resourced Communities in South Africa. Glob J Health Sci 2013; 5(4): 1-13. http://dx.doi.org/10.5539/gjhs.v5n4p1

[7] Batte A, Katahoire AR, Chimoyi A, Ajambo S, Tibingana B and Banura C. Disclosure of HIV Test Results by Women to their Partners Following Antenatal HIV Testing: a Population-based Cross-sectional Survey among Slum Dwellers in Kampala Uganda. BMC Public Health 2015; 15(1): 1-8. http://dx.doi.org/10.1186/s12889-015-1420-3

[8] Ezegwui HU, Nwogu-Ikojo EE, Enwereji JO and Dim CC. HIV Serostatus Disclosure Pattern among Pregnant Women in Enugu, Nigeria. J Biosoc Sci 2009; 41(6): 789-98. http://dx.doi.org/10.1017/S0021932009990137

[9] Yonah G, Fredrick F and Leyna G. HIV Serostatus Disclosure among People Living with HIV/AIDS in Mwanza, Tanzania. AIDS Res Ther 2014; 11(1): 5. http://dx.doi.org/10.1186/1742-6405-11-5

[10] Ayodeji and Patrick A. Factors Affecting Disclosure Of HIV Status to Sexual Partners among Women Attending Antenatal Clinic in State Specialist Hospital , IKERE-EKITI. South Am J Public Health 2014; 2(1): 1-9.

[11] Alemayehu M, Aregay A, Kalayu A and Yebyo H. HIV Disclosure to Sexual Partner and Associated Factors among Women Attending ART Clinic at Mekelle Hospital, Northern Ethiopia. BMC Public Health 2014; 14(1): 746. http://dx.doi.org/10.1186/1471-2458-14-746

[12] Amoran OE. Predictors of Disclosure of Sero-status to Sexual Partners among People Living with HIV / AIDS in Ogun State , Nigeria 2012; 15(4).

[13] Wong LH, Rooyen H Van, Modiba P, Richter L, Gray G, McIntyre Ja, *et al*. Test and tell: Correlates and Consequences of Testing and Disclosure of HIV Status in South Africa (HPTN 043 Project Accept). J Acquir Immune Defic Syndr 2009; 50(2): 215-22. http://dx.doi.org/10.1097/QAI.0b013e3181900172

[14] Sendo EG, Cherie A and Erku TA. Disclosure Experience to Partner and its Effect on Intention to Utilize Prevention of Mother to Child Transmission Service among HIV Positive Pregnant Women Attending Antenatal Care in Addis Ababa, Ethiopia. BMC Public Health. BMC Public Health 2013; 13(1): 765. http://dx.doi.org/10.1186/1471-2458-13-765

[15] Mucheto P, Chadambuka A, Shambira G, Tshimanga M, Gombe N and Nyamayaro W. Determinants of Nondisclosure of HIV Status among Women Attending the Prevention of Mother to Child Transmission Programme, Makonde District, Zimbabwe, 2009. Pan Afr Med J 2011; 8: 51.

[16] Kiula ES, Damian DJ and Msuya SE. Predictors of HIV Serostatus Disclosure to Partners among HIV-Positive Pregnant Women in Morogoro, Tanzania. BMC Public Health 2013; 13(1): 433. http://dx.doi.org/10.1186/1471-2458-13-433

[17] Tam M, Amzel A and Phelps BR. Disclosure of HIV Serostatus among Pregnant and Postpartum Women in Sub-Saharan Africa: A Systematic Review. AIDS Care 2015; 27(4): 436-50. http://dx.doi.org/10.1080/09540121.2014.997662

[18] Roxby AC, Matemo D, Drake AL, Kinuthia J, John-Stewart GC, Ongecha-Owuor F, *et al*. Pregnant Women and Disclosure to Sexual Partners after Testing HIV-1-Seropositive during Antenatal Care. AIDS Patient Care STDS 2013; 27(1): 33-7. http://dx.doi.org/10.1089/apc.2012.0327

[19] Desgrées-Du-Loû A, Brou H, Djohan G, Becquet R, Ekouevi DK, Zanou B, *et al*. Beneficial Effects of Offering Prenatal HIV Counselling and Testing on Developing a HIV Preventive Attitude among Couples. Abidjan, 2002-2005. AIDS Behav 2009; 13(2): 348-55. http://dx.doi.org/10.1007/s10461-007-9316-6

[20] Antelman G, Smith Fawzi MC, Kaaya S, Mbwambo J, Msamanga GI, Hunter DJ, *et al*. Predictors of HIV-1 Serostatus Disclosure: A Prospective Study among HIV-Infected Pregnant Women in Dar es Salaam, Tanzania. AIDS 2001; 15: 1865-74. http://dx.doi.org/10.1097/00002030-200109280-00017

[21] National Bureau of Statistics, United Republic of Tanzania. 2012 Population and Housing Census. Dar es Salaam 2013; 1-244.

[22] Katanga J, Mgongo M, Hashim T, Stray-Pedersen B and Msuya SE. Screening for Syphilis, HIV, and Hemoglobin during Pregnancy in Moshi Municipality, Tanzania: How is the Health System Performing (Short Communication). Sci J Public Heal 2015; 3(1): 93. http://dx.doi.org/10.11648/j.sjph.20150301.26

[23] Onono MA, Cohen CR, Jerop M, Bukusi EA and Turan JM. HIV Serostatus and Disclosure: Implications for Infant Feeding Practice in Rural South Nyanza, Kenya. BMC Public Health 2014; 14(1): 390. http://dx.doi.org/10.1186/1471-2458-14-390

[24] Jasseron C, Mandelbrot L, Dollfus C, Trocmé N, Tubiana R, Teglas JP, *et al*. Non-disclosure of a Pregnant Woman's HIV Status to her Partner is Associated with Non-optimal Prevention of Mother-to-Child Transmission. AIDS Behav 2013; 17(2): 488-97. http://dx.doi.org/10.1007/s10461-011-0084-y

[25] Semrau K, Kuhn L, Vwalika C, Kasonde P, Sinkala M, Kankasa C, *et al*. Women in Couples Antenatal HIV Counseling and Testing are not More Likely to Report Adverse Social Events. AIDS 2005; 19(6): 602-9. http://dx.doi.org/10.1097/01.aids.0000163937.07026.a0

[26] Kilewo C, Massawe a, Lyamuya E, Semali I, Kalokola F, Urassa E, *et al*. HIV Counseling and Testing of Pregnant Women in Sub-Saharan Africa: Experiences from a Study on Prevention of Mother-to-child HIV-1 Transmission in Dar es Salaam, Tanzania. J Acquir Immune Defic Syndr 2001; 28(5): 458-62. http://dx.doi.org/10.1097/00042560-200112150-00009

Received on 22-04-2016 Accepted on 15-06-2016 Published on 31-12-2016

DOI: http://dx.doi.org/10.12974/2313-0946.2016.03.01.2