

Uptake of HIV Re-Testing among Postpartum Women Who Initially Tested Negative during Antenatal Visit in Ubungo District, Dar es salaam

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Abstract

Background: It is recommended that HIV re-testing should be done at third trimester, labour and at six months postpartum. Reports indicate low rates of HIV re-testing among women after delivery. The study assessed the uptake of HIV re-testing among women during postpartum after initially testing negative at ANC clinic in Ubungo district, Dar es salaam.

Method: A cross-sectional analytical study was conducted among women who delivered during the study period. Data was collected through a standardised questionnaire and secondary data was collected from the Health Information System and ANC cards. SPSS version 28 was used to analyse data. Bivariate and multivariate logistic regression models were used to calculate the adjusted odds ratio and to quantify the association.

Results: 426 women participated in the study. The overall HIV re-testing rate was 76.1%, 23.9% did not re-test and 2.1% were infected with HIV after the second test. Married women have higher re-testing rates (52.8%) than single, separated and divorcees. Women aged 25-34 years have significant higher (84.6%) proportion of re-testing for HIV than those < 25 and those > 34 years of age ($p < 0.001$). Other significant predictors for HIV re-testing were women who made at least five or more visits to ANC and those who knew the HIV status of their partners.

Conclusion: HIV re-testing has not reached the Tanzania national target of 95%. Efforts to sensitise communities on the importance of early ANC booking at ANC and re-testing for HIV during labour, delivery and postpartum should be enhanced.

Keywords: ANC, HIV testing, postpartum, re-testing, uptake

1. Background

The Human Immunodeficiency Virus (HIV) pandemic remains a global major public health concern affecting all walks of life. According to the UNAIDS Global HIV & AIDS Statistics Facts Sheet (2020), 37.7 million people were living with HIV (PLHIV) globally, 1.5 million became newly infected and 680,000 people died from AIDS-related illnesses. The report indicates that among PLHIV, 36.0 and 1.7 million were adults and children aged 0–14 years respectively; and 53% were women and girls. In the sub-Saharan Africa, six in seven new HIV infections among adolescents aged 15–19 years are among girls; and young women aged 15–24 years are twice as likely to be living with HIV than men. Around 4,200 adolescent girls and young women aged 15–24 years became infected with HIV every week. Tanzania is equally affected by the pandemic and in 2019, 93,000 children aged 0-14 years were living with HIV; 8,600 were newly infected and 5,900 died from AIDS (UNAIDS, 2019).

HIV can be transmitted from an HIV-positive woman to her child during pregnancy, childbirth, and breastfeeding. Mother-to-child transmission (MTCT) accounts for most of the infections in children aged 0–14 years (Newell, 2000). Without treatment, if a pregnant woman is living with HIV, the likelihood of the virus passing from mother-to-child is 15% to 45%. However, antiretroviral treatment (ART) and other interventions can reduce this

risk to below 5% (WHO, 2020). Studies in UK and France have indicated that with optimum care for women who have an undetectable viral load (below 50 copies) at the time of delivery the HIV transmission rate from the mother to the child is 0.1% and 0.3% respectively. During breastfeeding however, the transmission rate is 0.3% if a woman breastfeeds for six months and 0.6% if breastfeeds for one year (Peters, 2017; Pebody, 2020).

Prevention of Mother to Child Transmission programmes provide a range of services to women and infants including preventing HIV infections among women aged (15–49 years), preventing unwanted pregnancies among women living with HIV, and providing women living with HIV with lifelong ART to maintain their health and prevent transmission during pregnancy, labour, and breastfeeding. In 2017, 80% of pregnant women living with HIV globally were receiving ART and around 1.4 million HIV infections among children were prevented between 2010 and 2018 due to the implementation of PMTCT services (WHO, 2016; UNAIDS, 2018). Despite this significant progress, in 2016, 740 000 women of reproductive age became HIV positive, the majority were in sub-Saharan Africa (UNAIDS(a), 2017). There are challenges in maintaining women living with HIV in care and on effective ART throughout the breastfeeding period, as well as reducing, detecting, and managing new infections that may occur among women during pregnancy or breastfeeding. This has in some countries resulted now in more infant infections occurring during postnatal period rather than during pregnancy or labour (UNAIDS(b), 2017).

Reports in Tanzania indicate that about 95% of the children acquire HIV infection through MTCT and the risks of transmitting the infection from the mother to the unborn child range between 15–45% among pregnant women living with HIV and not on antiretroviral therapy (AVERT, 2018; WHO, 2020). According to the national guidelines for the management of HIV and AIDS of Tanzania, 5-10% of infected infants occurred during pregnancy; 10-15% during labour and delivery and another 5-20% during breastfeeding. With the introduction of ART to pregnant women in the form of prevention and treat, the risk of transmitting HIV from mother to their babies has declined to less than 1% (Office of AIDS Research Advisory Council, 2019). Thus, vertical transmission of HIV is still a health problem needing urgent control response and early uptake and adherence to ART is vital in controlling HIV and its effects among children ((Tanzania Commission for AIDS (TACAIDS), 2018)).

In 2020, Tanzania adopted the current global response strategy of 95-95-95 whose aim is to end the AIDS epidemic by 2030 by achieving 95% diagnosis among all people living with HIV (PLHIV), 95% being on ART among the diagnosed, and 95% of people who are on ART have viral loads suppression (Dimitrov et al., 2021). The National Multisectoral Strategic Framework for HIV and AIDS (2018–2023) of Tanzania locally translates the global goals aiming similar achievement by 2030 including achieving the goal that 100% of pregnant women access ART in prevention of mother to child transmission (PMTCT) ((Tanzania Commission for AIDS (TACAIDS), 2018)). PMTCT in Tanzania like in many developing countries is challenged by pregnant women who tested HIV negative initially at ANC but do not return for re-testing as required and some become HIV positive.

The National Guidelines for the management of HIV/AIDS and the National Comprehensive Guidelines of HIV testing services of 2019 have directed that all pregnant women and their partners (unless known to be HIV positive) should be counselled and tested for HIV during their first antenatal care (ANC) visit. Among those who are HIV negative the repeat HIV test should be done during the third trimester or at labour and delivery. This should be followed with a third test at 6 months post-partum and thereafter as per general population to the voluntary counselling and testing guidelines (MHCDGEC, 2019; National AIDS Control Programme (NACP), 2019). Studies have evidenced benefits from early detection of sero-converters through re-testing and counselling among pregnant women and postnatal mothers. However, a study in Njombe region in Tanzania revealed low (30.4%) proportion of HIV negative mothers during ANC were re-tested of which 13.3% were found to be HIV positive, increasing chances of mother to child transmission (MTCT) (Nungu et al., 2019). This study aims to determine the uptake of HIV re-testing among postpartum women after initial HIV negative test result during the first HIV testing at ANC clinic in Ubungo district, Dar es Salaam, Tanzania.

2. Methods

2.1 Study Design

A cross sectional analytical study design was conducted among mothers who had delivered during the study period.

2.2 Study population and sample size

Target population included mothers who delivered in health facilities in Ubungo district. The study population however, included all women who delivered from September 2021 to October 2021 and were at least three months from the first HIV test at ANC in the selected health facilities. Mothers who were sick in postnatal wards and those

not able to read and write were excluded from the study. The estimated sample size of 426 was calculated using the Kish Leslie formula (Kish, 1965) based on estimated 50% HIV negative women at initial test who retested at ANC.

2.3 Sampling Technique

All post-partum mothers reporting at the clinic and who met the inclusion criteria were selected till the sample size was reached. Stratified sampling was used in selecting health facilities and convenience sampling technique was employed to obtain 426 representatives.

2.4 Data Collection Tool and Procedures

A structured questionnaire was used to collect data, and then records from the Health Information System and ANC clinic card were used in verifying the HIV testing history. The instrument was developed in English, then translated into Kiswahili by a professional proficient in both languages. The questionnaire contained questions collecting demographic data including age, education level, marital status, and employment status. Data on obstetric history including gestational age at the time of the first HIV tests, number of ANC visits and parity were also collected. The questionnaire was pre-tested on 10 women attending ANC at the Hubert Kairuki Hospital in Kinondoni district, Dar es Salaam, not part of the health facilities included in the study. Collected information was verified against the records on their ANC clinic cards and the Health Information System. The questionnaires were administered by the researcher and each session lasted for about 20 minutes. Two nurses from each health facility were recruited as research assistants and were trained for one week on the objectives of the study, methodology, interview techniques, ethics, and data collection tools.

2.5 Data Management and Analysis

The collected data was visually checked and reviewed at the end of each day and entered through SPSS data capturing sheet. Data quality was assured by linking data to the questionnaire and formatting the variables. The analysis was done by IBM Statistical Package for the Social Science (SPSS) version 28. Frequencies and cross tabulation were used to characterize the data and Chi-square statistics performed to check the association between variables. Multivariate logistic regression was done to identify the significant factors that contributed to the uptake of HIV re-testing and the p-value <0.05 was considered statistically significant.

2.6 Validity and Reliability

Validity was assured by ensuring that the structured questionnaire was designed carefully, the wording of the questions was selected carefully to avoid systematic misinterpretations by the mothers and expert opinions were sought from other public health experts and an experienced statistician. In addition, valid findings were achieved by employing an appropriate research design and accurate data collection methods.

To establish reliability in this study, the questionnaire was set in clear logical order, concise and unambiguous manner with meaningful and easy to follow instructions. Unnecessary, repetitive or inappropriate questions were avoided, and data collectors were trained effectively to minimise errors that might arise because of misunderstanding of the purpose and content of the instrument.

3. Ethical Consideration

Before data collection, the proposal received ethical clearance from the Hubert Kairuki Memorial University Institutional Ethics Review Board. Permission to conduct the study in the health facilities was sought from the Region Medical Officer, Municipal Council Executive Director, Municipal Council Medical Officer and from the health facilities management. All participants were provided with information on the study aims, methods, benefits and risk of the study in order to empower them to make informed choice voluntarily. Only participants who willingly accepted to participate in the study were asked to consent by signing an informed consent form. Confidentiality of the study participants was maintained by ensuring that participants were coded by numbers, no identifiable information that could be used to trace back to the participants was included in the data collection tool and no personal information was divulged to third party without the consent of participants. Only the researcher had access to the raw data.

4. Results

4.1 Socio-Demographic Characteristics

Table 1 presents the socio-demographic characteristics of the 426 participants who delivered during the study period. The age ranged between 18–45 years with median 27 years. Women aged 25–34 have higher re-testing rate (41.1%) than those below 25 and above 34 years. Married women have higher re-testing rate 225 (52.8%) than either single, separated or divorced. More than half of women 301(70.7%) who were unemployed have higher

proportion of re-testing than those employed.

Majority of the women who visited ANC services five times or more have higher re-testing rate 273(64.1%) than those who had less ANC visits; women with gestational age below 13 weeks re-tested more 295(69.2%) than those with 13 weeks and above gestational age. The overall re-testing rate was high 324(76.1%) and the remaining 102(23.9%) did not re-test. Of the study population, 9(2.1%) tested HIV positive after the second test.

Table 1. The distribution of demographic variables among postpartum women who tested HIV negative in initial HIV tests during antenatal visit in Ubungo District, Dar es salaam

Category	N	%
Age		
18–24 years	150	35.2
25–34	175	41.1
35–45	101	23.7
Marital status		
Married	225	52.8
Cohabiting	129	30.3
Others	72	16.9
Employment status		
Employed	120	28.2
Unemployed	301	70.7
Number of ANC visits		
≤4	153	35.9
≥5	273	64.1
Gestational age at first visit		
≤12	295	69.2
≥13	131	30.8
Number of children		
≤2	339	79.6
≥3	87	20.4
Mode of delivery		
SVD	352	82.6
CS	74	17.4
Partner HIV status		
Yes	294	69
No	128	39
Repeated test		
Yes	324	76.1
No	102	23.9
Result after second test		
Good	316	74.2
Not good	9	2.1
Not retested	101	23.7

4.2 Bivariate Analysis Results

The bivariate analysis results are presented in Table 2. Women aged 25-34 had a significant higher (84.6%) proportion of re-test for HIV than those below 25 and those above 34 years of age ($p = <0.001$); women who had visited ANC services were five times or more likely to repeat the HIV test (82.8%) than those (64.1%) who attended less ($P = <0.001$). Similarly, women who knew the HIV status of their partners ($P = 0.001$); number of children ($P = 0.004$) and gestation age at first visit ($P = 0.034$) significantly re-tested compared to those who had no knowledge. Marital status ($P = 0.353$), employment status ($P = 0.525$) and mode of delivery ($P = 0.607$) did not significantly influence women to re-test for HIV.

Table 2. Bivariate analysis results of factors associated with uptake of HIV testing among postpartum women who tested HIV negative in initial HIV tests during antenatal visit in Ubungo District, Dar es salaam

Variable	N	% Retested	p - value
Age			
18-24	150	74.7	
25-34	175	84.6	< 0.001
35-45	101	63.4	
Marital status			
Married	225	77.3	
Cohabiting	129	77.5	0.353
Others	72	69.4	
Employment status			
Employed	120	78.3	
Unemployed	301	75.4	0.525
Number of antenatal visits			
≤ 4	153	64.1	< 0.001
≥ 5	273	82.8	
Gestational age at first visit			
≤ 12	295	79	0.034
≥ 13	131	69.5	
Number of children			
≤ 2	339	79.1	0.004
≥ 3	87	64.4	
Mode of delivery			
SVD	352	75.6	0.607
CS	74	78.4	
Partner HIV status			
Yes	294	81	0.001
No	128	64.8	

4.3 Multivariate Analysis Results

The multivariate analysis results (Table 3) indicate that women who attended ANC services five and more visits had higher Odds to repeat the test than those who attended less than five visits [(AOR 2.121, 95%CI 1.046 – 4.301), $p = 0.037$]. Similarly, women with knowledge on the HIV status of their partner were more likely to repeat the test than those who do not know the partner's HIV status [(AOR 2.035, 95% CI 1.217–3.403), $p = 0.007$].

Table 3. Multivariate analysis results among postpartum women who tested HIV negative in initial HIV tests during antenatal visit in Ubungo District, Dar es salaam

Variable	Odds ratios	95% Confidence Interval		p = value
Age in group				
18–24	1			
25–34	1.623	0.879	2.958	0.122
35–45	0.445	0.156	1.266	0.129
Marital status				
Married	1			
Cohabiting	0.954	0.546	1.669	0.87
Others	0.706	0.364	1.368	0.302
Employment status				
Employed	1			
Unemployed	1.112	0.62	1.993	0.722
Number of ANC visits				
≤4	1			
≥5	2.121	1.046	4.301	0.037
Gestational age at first visit				
≤12 weeks	1			
≥13 weeks	0.923	0.534	1.594	0.774
Number of children				
≤2	1			
≥3	1.05	0.365	3.016	0.928
Mode of delivery				
SVD	1			
CS	0.887	0.458	1.721	0.724
Knowledge of Partner HIV status				
Yes	1			
No	2.035	1.217	3.403	0.007

5. Discussion

Previous studies have indicated low rate of uptake of re-testing for HIV among mothers' post-delivery. The study in Njombe region in Tanzania indicates that only 30.4% of the women returned for the second HIV test (Nungu et al., 2019). Similarly, low rates of HIV re-testing have been reported in Sub-Saharan Africa (Regan et al., 2013, Heemelaar et al., 2015); in Croatia (Matković, 2014) as well as in the far east (Hanh et al., 2011, Wimonstate et al., 2011). In this study, the overall uptake of HIV re-testing was encouragingly high (76%) but has not reached the 95% of national and global target that pregnant women and breastfeeding women are aware of their HIV status. While the Njombe report (Nungu et al., 2019) indicates that only 43.7% of women attended more than four visits, in this study 64.1% of women had attended five ANC visits and above of which 82.8% re-tested for HIV.

ANC programmes were introduced as a constellation of interventions that a pregnant woman receives from health care services (Mathai M, 2011). ANC aims to prevent and identify pregnancy risks and treat conditions timely through providing appropriate information and quality services to the pregnant women (Singh et al., 2009; World Health Organization & United Nations Children's Fund, 2013). More visits to ANC have shown to provide mothers with sufficient time to internalise information on the provided ANC services and enhanced client-provider interactions which remind mothers on the importance of HIV re-testing and empower them to make rational decision on re-testing (Molla, 2018). We attribute our finding to strategic encouragement of women to make at

least five visits to ANC as recommended by WHO (World Health Organization, 2002) which gave them opportunity to repeat HIV test compared to those who made less than five visits. In addition, the finding suggests that trust has been built among pregnant mothers on ANC services and packages offered during the visits and consequently influencing attitude and stigma perception towards HIV testing.

We found that the knowledge of women on the HIV status of their spouses significantly influenced women to return for HIV testing when compared to women who had no knowledge of their spouse's HIV status. It could be argued that information of the HIV status of the partner builds confidence among pregnant women if they had tested negative during ANC visits and they would subsequently want to remain negative. Such confidence may also be influenced by their male counterparts in cases where males were involved during the first test, and both had tested negative. Engagement of the males, therefore, could play a key role in raising the HIV re-testing, therefore, effort should target males and motivate them to accompany their spouses when attending ANC services where correct and appropriate information on the risks of contracting HIV can be explained.

Reports show that some women who had tested negative during the first ANC visit sero-convert to positive during re-testing. Among the reasons advanced were that women may have been tested during the incubation period during which seroconversion could hardly be detected. Previous studies, however, have reported varying rates of seroconversion (Umeononihu et al., 2013; Lawi et al., 2015; Msuya et al., 2006). We found the overall proportion of infected women who had tested HIV-negative during the initial test was 2.1% among 76.1% of the women who re-tested. This finding is lower than 13.3% from 30.4% of the women who had re-tested in Tanzania (Nungu et al., 2019), but higher than 0.5% and 0.4% reported in Zambia and Kenya respectively (Mandala et al., 2019; Penumetsa, 2018). Variations in the sero-conversion rates could be attributed to regional variations in HIV testing policies, health facility related factors including quality of services and packages offered at ANCs, healthcare provider practices, access to testing facilities as well study methodologies. The low sero-conversion rate in this study could in addition be due to government initiatives and civil society campaigns which have raised awareness of the risks of late booking and few ANC visits among pregnant mothers and a progressive decreased HIV prevalence in communities in Tanzania.

In a study in Kisumu, Kenya (Molla, 2018), older women were more likely to repeat the test than younger ages. In this study, age 25–34 years significantly influenced women to re-test for HIV compared to the much older and those aged below 25 years. This finding differs from the previous report in Tanzania (Nungu et al., 2019) which found that HIV reuptake among women aged > 25 years did not differ from those < 25 years. The lower rate of HIV test reuptake among those below 25 years in this study could be explained by low parity, being young, inexperienced with ANC services, perception of being healthy and therefore, low risk of HIV infection. On the other hand, the low rate of HIV re-testing among women aged > 35 year could be explained by false confidence built from previous experiences of testing negative, trust on their spouses and therefore, low risk of HIV infection. Health information should continue to be given covering all reproductive age groups and motivate older and young pregnant women to book at the ANC clinics early and attend ANC more frequently during which they will be checked and appropriately counselled.

6. Conclusion

The uptake of HIV re-testing was high but still below the Tanzania national target of 95%. Five or more visits at ANC improved the uptake of HIV re-testing; still a small proportion of women who had tested negative previously tested positive during re-testing. The younger age < 25 and older age > 35 have lower re-testing uptake.

7. Recommendations

Efforts to further raise awareness of the need to visit ANC clinics as per the national and international guidelines should be enhanced and major stakeholders including health care workers, government ministries, NGOs and the civil society. All appropriate approaches including the media should be involved. Further qualitative studies are needed to explore the determinants of HIV re-testing uptake among women in the reproductive ages with a view to design innovative strategies to improve HIV re-testing uptake.

Availability of Data and Materials

All data and materials concerning this research article are available for sharing if needed.

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Authors' Contribution

TS: concept development and design also participate in data collection; TK supervised the principal author. IS: Data quality checks, cleaning and performed statistical analysis; and MN and YM supervised and critically reviewed, formatted and edited the manuscript. All authors participated equally and proofread the manuscript several times for final submission.

Competing Interests Statement

All authors have declared no conflict of interest on any part of this manuscript.

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