

EPIDEMIOLOGY AND RISK FACTORS OF HIV INFECTION AMONG URBAN WOMEN IN TANZANIA: EVIDENCES FROM TANZANIA HIV/AIDS 2011-12

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ABSTRACT

The present study was carried out to examine the determinants of HIV infection among women who lived in an urban area in Tanzania. The Tanzania HIV/AIDS and Malaria Indicator Survey (2011-12) data has been used. The sample size for urban and rural women who were tested for HIV and ever had sex was 2227 and 6210. Bivariate and multivariate analyses were used. The present study revealed that rural women were significantly less likely to be HIV-infected compared to urban women. In urban areas, the majority of women had more than two partners. Those women who had more than five sex partners were significantly four times more likely to be HIV-infected compared to women had one sex partner. There is an urgent need for a short and effective program to control the HIV epidemic in urban areas of Tanzania especially for women.

Keywords: Women; Urban; HIV/AIDS; Tanzania; Africa; Monitoring

INTRODUCTION

About 3.1 million people newly infected in 2001, whereas about 2.7 million (15% fewer than 2001) people were newly infected with HIV in 2010 (1). During 2001 to 2009, the incidence of HIV infection has declined in 33 countries among which 22 countries located in Sub-Saharan Africa (2). Globally, in 2009, about 72% HIV-related deaths occurred in Sub-Saharan Africa, even with the exertions of antiretroviral therapy (3,4). Tanzania is the country that was hardest hit by the HIV epidemics in Sub-Saharan Africa (3). According to the Tanzania HIV/AIDS and Malaria Indicators Survey (THMIS, 2007-08) report, the prevalence of HIV was decreased from 7.0% in 2004 to 5.8% in 2008 (6). However, the decrease was significant among men, but not among the women (2,6,7). Many recent studies had shown that HIV epidemic was prevalent more likely among women than men due to biological difference, social disparities and lack of participation of men towards women reproductive health (2,8,9,10). According to the UNAIDS, about 52% adults living with HIV infection were women, and the rate of HIV infection among young women aged 15-24 years was persistently high (4). According to THMIS 2013 report, the prevalence of HIV infection among women than men was high in Tanzania (11). However, few previous studies had found a high prevalence of HIV infection among urban women than in rural women (3). In 2011-12, the prevalence of HIV infection among women was decreased (11), but urban women still have a large share of HIV infection. Therefore, the question was raised why urban women have a high risk of the HIV infection in the country and what were the factors

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that had contributed to HIV infection among urban women. Thus, there was a need to study the determinants of HIV infection among urban women in Tanzania.

MATERIALS AND METHODS

Data Sources: Tanzania HIV/AIDS and Malaria Indicator Survey (THMIS) was the third cross-sectional population-based, comprehensive survey on HIV/AIDS carried out in Tanzania during 2011-12. The survey was conducted by the Tanzania Commission for AIDS (TACAIDS) and the Zanzibar AIDS Commission (ZAC) in collaboration with the National Bureau of Statistics (NBS), the Office of the Chief Government Statistician (OCGS), Zanzibar implemented THMIS, and ICF International provided technical assistance through MEASURE DHS (11).

Sampling Method and Design: A multi-stage cluster sampling method has been employed to recruit respondents in the survey (THMIS). The sampling frame was based on the 2002 Population and Housing Census (PHC) that was developed by the National Bureau of Statistics (NBS). Similar sampling frame was used for the 2010 and 2004-05 Tanzania Demographic and Health Survey (TDHS) and THMIS (2007-08). (for detailed information, read report THMIS 2013) (11).

Description of Variables: Several variables were used in the study to understand the factors affecting the high prevalence of HIV among urban women. These variables were concisely explained in the following section.

Dependent variable: HIV serostatus was taken as the dependent variable. HIV Seropositive coded as 1, considered as the women have HIV infection, whereas HIV-seronegative coded as 0, considered as the women do not have HIV infection.

Independent Variables: The study included a set of predictor variables to examine their effect on the HIV prevalence. The study divides variables into three categories, namely as socio-economic, behavioral and biological characteristics. The variable describes as follows:

Socio-economic characteristics: Women's age groups in years (15-19, 20-24, 25-29, 30-34, 35-39, 40-44,45-49); age at first sex in years (below 16, 16-17,18-19, 20 and above); women's education level (no education, primary incomplete, primary complete, secondary and above education); wealth quintiles (poorer, poor, middle, rich, richest); regions (Eastern, Western, Southern, Southern highlands, South West highlands, Central, Northern, Lake and Zanzibar)

Behavioral and biological characteristics: Number of nights spent outside in the last 12 months (1, 2, 3-4, 5 and above); number of sexual partners (1, 2, 3-4, 5-9, 10 and above); HIV status (HIV negative and HIV positive); condom used in the last 12 months (no, yes);

had genital sore/ulcer in the last 12 months (no, yes); had genital discharge in the last 12 months (no, yes)

Statistical Analysis: The study used bivariate and multivariate techniques to understand the prevalence of HIV among women in association with their place of residence. Multivariate logistic regression analysis was applied to identify the effect of socio-economic, behavioral and biological characteristics of women (15-49 years) on their HIV status.

RESULTS:

Prevalence of HIV among women living in urban and rural areas by background characteristics: Table 1 revealed the prevalence of HIV infections among women (15-49 years) according to their socio-economic and behavioral characteristics varying with their place of residence in Tanzania, 2011-12. Women from urban areas who were tested and had ever sex were more HIV positive (10%) compared to the rural women (5.8%). The risk of HIV increased with an increase in age of women. About 11% women were found to be HIV positive who had first sex below age 16 years and living in urban areas that were much higher than the percentage of women belong to rural areas (6%). The difference in the risk of acquiring HIV by women from rural and urban areas was observed by their level of education. For instance, women with higher education from urban areas were more HIV infected (8.1%) than the women with higher education from a rural area (5.3%). Urban women who had reported having two sexual partners were three times more risk of becoming HIV positive (12.2%) compared to women with single sexual partner (4.4%), whereas women having five or more sexual partners were four times more HIV positive (16.6%). In the Southern area of Tanzania, about 19% urban women were HIV positive whereas 10.2% women from the rural area were HIV positive. About 10% urban women, belonged to the Western regions, South-West highlands, Lake and Central regions, were found HIV positive. Contrary to this, in rural areas of Southern highlands and South-West highlands, more than 10.0% women were found HIV positive. The Zanzibar was the only region where percentage of HIV infected (1.2%) women was more in rural areas compared to the urban areas, although the difference was very less (1.6%).

Table 2 showed the association of HIV prevalence with the biological characteristics of women by their place of residence in Tanzania. About 10% urban women were HIV positive, whereas 5.8% rural women were HIV positive. About 17.3% urban and 20.3%, rural women were HIV positive who had sexually transmitted disease in the last year. The urban women who had genital ulcer in the last year, about 22.5% of them were found to be HIV-infected, whereas the percentage decreased for rural women (15.3%).

Risk factors for HIV infections from Multivariate Logistic Regression Analyses Results: The Table 3 presented the risk factors of HIV infection among women who were tested and ever had sex in model 1 whereas model 2 showed risk factors of the HIV infection among urban women after controlling for selected socioeconomic, behavioural and biological characteristics of women. The Model 1 found that rural women who were tested and ever had

sex were significantly less likely to be HIV-infected (OR = 0.612, $p < 0.001$) compared to urban women. Women, belonged to upper age groups (45-49 years), were four times more likely to be HIV-infected (OR = 4.571, $p < 0.001$) compared to women of younger age groups (15-19 years). Women who had more than two sexual partners were significantly three times more likely to be HIV-infected (3-4 partners, OR= 3.535, $p < 0.001$; 5-9 partner, OR = 4.491, $p < 0.001$; 10+ partner, OR = 4.682, $p < 0.001$) compared to women who had single sexual partner. Women who had spent night outside more than five times in the last one year were found four times more HIV-infected than the women who did not a spend single night outside the home. Women, who had any one STI/Ds (Sexually Transmitted Infections/Disease), were two times more HIV infected as compared to women who did not have any STIs.

From model 2, we found urban women who had first sex after age 20 years were significantly less likely to get HIV infected (OR = 0.571, $p < 0.01$) compared to women who had first sex before age 16 years. In urban areas, women who had spent night outside the home (more than 3 to 4 times) in last 12 months, were more likely to be HIV positive (OR = 1.577, $p < 0.01$) compared to women who had not spent a single night outside the home. Urban women who had more than two sexual partners were two times more likely to get HIV infected (2 sexual partners, OR = 2.09, $p < 0.01$; 3 to 4 sexual partners, AOR = 2.069, $p < 0.01$) compared to women who had single sexual partner.

DISCUSSION

The prevalence of HIV has been declined in Tanzania during the last decade (3,4). This trend was also similar to the trends apparent in Eastern and Southern African countries like Uganda, Malawi, Zimbabwe, and Kenya (12,13,14,15,16,17). According to THMIS, overall HIV infection was declined from 7.0% in 2004 to 5.1% in 2012 (11,18). Although, previous literature had shown that the prevalence of HIV infection in Tanzania was declined mainly due to the significant decrease in HIV prevalence among men in urban areas (3). A recent survey report (THMIS,2011-12), showed a high prevalence of HIV infection among women (6.2%) over men (3.8%) in Tanzania. Surprisingly, about 9% urban women had HIV infection whereas for rural women the percentage was 5.1. Therefore, we found that urban women were more vulnerable to the HIV infection than rural women were. However, very limited studies were carried out in East Africa, and much more work is needed on this issue.

The present study found that among urban women (15-49 years) who were tested for HIV and ever had sex, HIV prevalence was high (10.01%) compared to rural women (5.8%). Mmbaga (2013) had revealed that women in urban areas were at greater risk of acquiring HIV. Similar with the results of a previous study (3), the findings of the present study also revealed that the risk of getting HIV was increased as a woman's age increased. Women with secondary and higher education were less likely to be HIV-infected compared to uneducated women. Although, earlier educated people were at the higher risk of getting HIV compared to un-educated women, as educated person move to other places more frequently and have

affordability for paid sex (18,19,20). However, intervention or prevention program against HIV infection had reduced HIV prevalence among educated women (21).

In Africa, the prevalence of HIV/AIDS was decreased due to the behavioural change (16). Women who spent two or more nights outside in last 12 months were found more likely to be HIV-infected than women who did not spend night outside. Similarly, women who had two or more sexual partners were three times more HIV-infected than who have single sexual partner. The findings of the present study were consistent with other research (3,16). The studies had reported that reducing the number of sexual partners had decreased the risk of HIV transmission (13,22,23). In the previous studies, researcher and social scientist had found young females, married individuals, and those who had higher education were at higher risk of HIV infection compared to other groups in Tanzania [24,25].

Indeed, the present study forwarded that urban women were at the higher of getting HIV infected than rural women in Tanzania. Our analysis showed strong and consistent effect of behavioural characteristics on the risk of the HIV infection among urban women. The risk of HIV infection was higher among uneducated or primarily educated women, among women with two or more sex partners, among women who spent night outside, and had any STD's. Therefore, prevention program aimed to reduce the HIV infection among urban women are the utmost requirement.

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Table 1 Prevalence of HIV among women aged 15-49 years who were tested for HIV and ever had sex by their socio-economic and behavioural characteristics, THMIS, 2011-12

Background Characteristics	Urban		Urban Sample Size	Rural		Rural Sample Size
	HIV-	HIV+		HIV-	HIV+	
Age in 5-year groups						
15-19	98.1	1.9	251	98.5	1.5	767
20-24	93.1	6.9	403	96.3	3.7	1154
25-29	90.2	9.8	521	94.2	5.8	1142
30-34	86.8	13.2	382	92.3	7.7	932
35-39	87.0	13.0	292	93.5	6.5	973
40-44	88.6	11.4	219	91.4	8.6	682
45-49	82.7	17.3	161	91.8	8.2	559
Women's Education						
No education	90.2	9.8	150	94.9	5.1	1495
Primary incomplete	88.0	12.0	174	93.4	6.6	869
Primary complete	89.2	10.8	1302	94.0	6.0	3348
Secondary+	91.9	8.1	602	94.7	5.3	499
Wealth index						
Poorest	82.5	17.5	47	95.3	4.7	1465
Poorer	100.0	0.0	39	94.7	5.3	1541
Middle	89.5	10.5	93	94.0	6.0	1452
Richer	87.3	12.7	445	93.8	6.2	1272
Richest	90.7	9.3	1604	91.2	8.8	479
Number of night spent outside (last 12 months)						
None	91.3	8.7	889	95.2	4.8	3680
1-2	89.7	10.3	969	92.7	7.3	1943
3-4	87	13.0	254	94.1	5.9	446
5+	88.4	11.6	117	89.4	10.6	141
Number of sexual partner						
1	95.6	4.4	752	97.5	2.5	2885
2	87.8	12.2	585	92.6	7.4	1618
3-4	88.6	11.4	612	90.8	9.2	1232
5-9	83.2	16.8	180	87.9	12.1	402
10+	73.4	26.6	68	90.4	9.6	56
Region						
Eastern	90.8	9.2	841	93.6	6.4	462
Western	88.2	11.8	164	95.8	4.2	507
Southern	90.8	9.2	148	96.1	3.9	310
Southern Highlands	81	19.0	153	89.8	10.2	790
South West Highlands	87.3	12.7	147	89.8	10.2	682
Central	89.3	10.7	93	97.4	2.6	769
Northern	93.4	6.6	244	95.8	4.2	698
Lake	89.4	10.6	369	94.8	5.2	1825
Zanzibar	98.8	1.2	68	98.4	1.6	167
Total			2227			6210

Table 2 Prevalence of HIV among women aged 15-49 years who were tested for HIV and ever had sex by their biological characteristics, THMIS, 2011-12

Background Characteristics	Urban		Urban Sample Size	Rural		Rural Sample Size
	HIV-	HIV+		HIV-	HIV+	
HIV status						
No	89.9	-	2003	94.2	-	5851
Yes	-	10.1	224	-	5.8	359
STIs in last 12 months						
No	90.4	9.6	2116	94.6	5.4	5996
Yes	82.7	17.3	94	79.8	20.2	164
Had genital sore/ulcer (last 12 months)						
No	90.3	9.7	2152	94.5	5.5	6015
Yes	77.5	22.5	72	84.7	15.3	187
Had genital discharge (last 12 months)						
No	90.1	9.9	2084	94.5	5.5	5879
Yes	87.1	12.9	140	89.6	10.4	323
Total			2227			6210

Table 3 Results from Logistic Regression Analysis showing factors affecting HIV prevalence among women aged 15-49 years who were tested for HIV and ever had sex, THMIS, 2011-12

Background Characteristics	Model 1			Model 2		
	Exp(β)	95% C.I. for Exp(β)		Exp(β)	95% C.I. for Exp(β)	
		Lower	Upper		Lower	Upper
Place of residence						
Urban [®]	1					
Rural	0.612***	0.491	0.763			
Women's age groups (years)						
15-19 [®]	1			1		
20-24	2.138**	1.216	3.758	2.721**	1.088	6.804
25-29	2.555**	1.468	4.446	3.649**	1.474	9.03
30-34	4.688***	2.722	8.075	7.143***	2.912	17.521
35-39	3.869***	2.218	6.750	7.251***	2.914	18.04
40-44	3.471***	1.930	6.243	6.888***	2.696	17.595
45-49	4.571***	2.531	8.255	7.464***	2.838	19.632
Women's education						
No education [®]	1			1		
Primary incomplete	1.257	0.876	1.804	0.837	0.429	1.632
Primary complete	1.234	0.922	1.652	0.760	0.439	1.316
Secondary+	0.633*	0.477	0.841	0.328**	0.172	0.624
Wealth quintiles						
Poorer [®]	1			1		
Poor	1.19	0.821	1.725	0.882	0.179	4.332
Middle	1.342*	0.937	1.922	1.960	0.573	6.708
Rich	1.378	0.967	1.965	1.835	0.624	5.39
Richer	1.268**	0.838	1.920	1.637	0.564	4.753

**Number of night
spent outside
(last 12 months)**

None [®]	1			1		
1-2	1.310**	1.055	1.628	1.485*	1.077	2.047
3-4	1.271	0.900	1.794	1.577*	1.013	2.454
5+	1.168	0.702	1.941	0.847	0.497	1.443

**Number of sexual
partner**

1 [®]	1			1		
2	3.249***	2.426	4.351	2.090**	1.267	3.447
3-4	3.535***	2.614	4.778	2.069**	1.268	3.378
5-9	4.491***	3.106	6.494	2.125**	1.232	3.666
10+	4.682***	2.500	8.768	2.203**	1.218	3.986

**Condom used
(last year)**

No [®]	1			1		
Yes	2.868***	2.267	3.628	2.833***	2.090	3.841

STIs in last 12 month

No [®]	1			1		
Yes	2.737**	1.854	4.042	1.708**	0.975	2.993

[®]-Reference category of different characteristics; ***p<0.001, **p<0.01, *p<0.05