THE IMPACT OF INTERNAL MIGRATION ON HIV/AIDS TRANSMISSION IN TANZANIA

Review Article

ABSTRACT

This study examines the complex and dynamic relationship acting between the internal migration and the spread of HIV/AIDS in Tanzania. The study uses the Tanzania HIV/AIDS and malaria indicators Survey (2011-2012) data extracted from the National Bureau of Statistics database. The study applied multivariate and logistic regression to analyze the determinants of HIV/AIDS prevalence in Tanzania. The study found that there are marginal differentials in the HIV/AIDS prevalence between migrants and non-migrants, but considering gender-wise differences the trend is substantially significant. The infection rate is higher to migrants aged thirty and above (17.3% for male and 17.5% for female) and with no education. The study also found that the HIV/AIDS prevalence is higher for non-agricultural occupations dominated by females while males account high percentage for non-working group. This study is important to government and stakeholders for addressing the dynamic interactions, policies and programs established to reduce the migration to the spread of the HIV/AIDS. Also, this study show how the different forms of migration influence the spread of HIV/AIDS. As a suggestion, the pilot program could be crucial and cost-effective for addressing factors contributing to the spread of HIV/AIDS.

Keywords: mobility, migrants,vulnerability

1. INTRODUCTION

Unparalleled human migration within and across political and geographical boundaries is a dynamic phenomenon in both developed and developing countries. Migration may be temporary or permanent. People have a tendency to leave the areas in which life is difficult and migrates to the areas where life may be better and cheaper. Migrants are at particularly high risk of HIV infection all over the World due to marginalization, exclusion and barriers to accessing health care facilities. The movement of migrants may bring new infection agents from their origin place and introduce them into their place of destination. For that reason, with the movement of people, diseases of various types also moves from place to place.

Today diseases like AIDS have risen ever experienced, presents a significant challenge to this technological advancements era. For example, African countries, which contribute only 10 percent of the world population remains the most affected regions with more than 25.8 million people living with HIV/AIDS. In addition, more than one million of new infection cases are reported every day and more than 2.4 million young adults and children die annually from AIDS-related illness (UNAIDS, 2005). The amount is comparatively higher compared to some Asian countries where the economic level and activities are almost the similar. In sub-Saharan Africa, the spread of HIV/AIDS is greater among the individuals living along the major traffic highways and to people with migration experience or migrant sexual partner (Brockerhoff and Biddlecom, 1999). Statistical report in Tanzania show that 2.7 million live with HIV/AIDS, which is equivalent to more than 400 new infections every day (UNAIDS, 2012).

Empirical studies show that the linkage between the migration and HIV/AIDS is significant (Dean et al., 2010; Coffee et al., 2005;Crush et al., 2006; Kishamawe et al., 2006; Mmbaga et al., 2008; Campbell, 2009). Many studies vastly seek to investigate one of the two dynamics. On one hand, migrants can increase the rate of human interaction and expose them to sexual partners coming from a place of high background prevalence rate (Coffee et al., 2007). On the other hand, various researchers look the association between the socio-economic pattern of the migrants, poor accessibility to health care and the difficulties of the host community to mingle with the traditions and practices of migrants.The second mechanism attempts to show the linkage between HIV/AIDSand demographic/household characteristics (Hargrove, 2008; Wojcicki, 2005;Greener and Sarkar,2010;Iwara and Alonge,2014; Peltzer and Pengpid, 2013).

It has been a challenge to understandingthe linkage between the migration and the spread of HIV/AIDS in broader scope because movements that influence the spread of the disease occur in different forms (Campbell, 2003). Several factors increase human migration within and across geographical boundaries vulnerability to HIV/AIDS. These include the separation from families and partners and also from the norms that guide behavior in hosting communities.Various researchersargue that migration does not affect the spread of HIV/AIDS by itself, but socio-economic patterns of the migrants. The situation of migrants during the whole process of migration go hand in hand with xenophobia, isolation and hostility from the host community (Haour-Knipe, 1996). Also, the stigmatization and discrimination has been experienced by various migrants as well as the misconception about the HIV infection, power imbalances and gender and income inequalities (Campbell et al., 2003).

Despite a comprehensive reviews to demonstrate that migration and HIV/AIDS interact in complex manner, little has been reached and understood about these linkage in the Tanzania perspective. This study postulates a review of the literature on migration and HIV/AIDS and attempts to draw linkage between the two powerful dynamics which are at play in Tanzania. In addition, study stimulates the discussion and provide a platform for understanding the reasons influencing migration, intervention policies, protective support and the perception of the hosting community.

2. LITERATURE REVIEW

2.1 Empirical Review

This part sheds light on the theoretical pattern for examining the individuals' migration and HIV/AIDS conditions. Vissers et al. (2008) investigated to what extent the partner absence leads to more risky sexual behavior among the Tanzanian couples. Results found that risk sexually behavior occur more often in men with multiple residents and in women living apart infrequently seeing their spouses. In addition, the relation between the HIV/AIDS transmission to all aspects of the sexual behaviorhas been studied by many researchers including Voeten et al. (2009). The migrants and spread of HIV/AIDS in the mining industry in South African mines has been carried out by (Lurie et al., 2003a; Zuma et al., 2003) and references herein. While the East African truck drivers found in (Ramjee and Grouws, 2002;Douglas, 2000;Kamwanga et al., 2006).

Suryawanshi et al. (2014) assessed the association degree of male mobility with paid sex, alcohol and use of condoms at all places visited by migrants in New Delhi-India. Results revealed that compared to the non-migrants, highly mobile men are more likely to contract HIV/AIDSin all locations along the routes of mobility. In addition, the study found thatthe whole process of migration increases the chance of the migrants to contract the disease after establishing asexual relationship with infected individuals. Verma et al. (2010), and Saggurti et al. (2011) conducted similar research in India, which focused on investigating the relation existing between male migrants and spread of HIV/AIDS.Findings documented that the

returned migrants and active migrants are at higher sexual risk behavior than non-migrants.Finally,they suggested that there is a need to intervene the spread of HIV with respect to the origin and most vulnerable group. Mweru (2008) and Lyons(2004)considered the linkage between HIV/AIDS and migration using the demographic and health survey data of Kenya. Findings pointed out that migrants are at critical risk than other groups. They suggested that unless proper mechanisms are invested to reduce the outflow in Kenya, migrants will continue to bring disasters in the society, particularly the spread of HIV/AIDS. A comprehensive reviews on spread of HIV/AIDS among the fishing community along the Lake Victoria found in (Haour-Knipe, 2008; Crush et al., 2006; FAO/MAAIF report, 2002). These references postulated that 23 percent of the population migrated to this area never attended school, and the orphaned girls lured into a sexual relationship with older and married men for material benefits were high. In addition, the engagement of married women with wealthy men in an intimate relationship has persisted in the area for long time.

Conflict and wars increase the spread of HIV/AIDS directly or indirectly due to refugee movements and the collapse of health care infrastructures (Collier, 2008; Oppong and Agyei-Mensah, 2004). The spread of the sexual transmitted disease, particularly HIV/AIDS is higher in the areas or zones with conflict because the whole process of movement acceleratesunusual behavior such as rapping.The relationship between urbanization and the spread of HIV/AIDS infections in sub-Saharan African extensively studied, see (Adeni, 2004; UN population division, 2009) for details. The authors concluded that the process of urbanization contributes significantly to the spread of HIV/AIDS infections, more specifically to areas experiencing high migration rate in Africa. The spread of HIV/AIDS along the major roads and freeways has been described in the work of Tanser et al. (2000), and Arroyo et al.(2005,2006). Findings showed that the virus undergoes the Rubik-cube-like genetic modification, and it's genetic constantly mutate, revise and transform away in population that reside in the major roads systems.Bouare (2007) considered the magnitude of risky sexual behavior for in-migrants, poor in-migrants and out-migrants in relation to HIV/AIDS prevalence. Results indicated that the distances between the provinces/regions of the origin and destination matters in influencing the spread of HIV/AIDS.

Workers in agriculture plantations are among the specific population occupations, which have been found to have higher vulnerability to HIV/AIDS than the average population in Kenya (Buregyeya et al., 2008). The combined impacts of adverse socio-economic and labour conditions in the agriculture plantation provide a clear picture of the magnitude of the spread of HIV/AIDS. Likewise, Saliu and Orisagbemi (2010) considered the farmer's perception of HIV/AIDS.Findings showed that HIV/AIDS has adverse effects on farmer's health, and 4.13 percent of respondents revealed that stigmatization prevents them from going for HIV/AIDS test.In addition, a similar research carried out on the border of South Africa and Mozambique on farm worker migrants located in boarding part of the two countries (IOM, 2004). The study found out that the living conditions of working women hired for temporary work were miserable. The rooms were overcrowded, and the food was nutritionally sub-standard with low wages for temporary workers. While male farm workers with permanent employment received good salary enough for better living. Such situation allowed men to take advantage over women's hardship to exploit them sexually promising them the bright future. Unfortunately, after conceiving they end up chased out, due to thedifficulty coupled with circumstantial temptations, and desires to sustain a living they establish new sexual relation, as a result,increases the spread of HIV/AIDS.

Various researchers have examined the effects of human capital on the relationship between income inequality and HIV prevalence including Dasmini and Annim (2011).The main findings revealed the hypothetical of an underestimation of the effects of income inequality of HIV prevalence. Coulibaly (2005) investigated spread of HIV/AIDS among the permanent employees in Sub-Saharan Africa. The study point out thatthe employees with a permanent contract HIV/AIDS more quickly than employees with

temporarily contract due to wealth differentials. The studies relating demographic characteristics and seasonality employeesto spread of HIV/AIDS found that permanent employee's at all skilled levels are at higher risk (Evian et al., 2001).

The study conducted among the Tanzanian couples revealed that long-term migrant women married to mobile partners were in high-risk sexual behavior and HIV prevalence (Kishamawe et al., 2006; Mmbaga et al., 2008). A study carried out to investigate how the mobility related to sexual risk behavior and HIV/AIDS infection with particular reference to the partners who stay behind with mobile couples. This longitudinal study reveals that long-term mobile men were not at risk compared to resident men but for short term mobile men. The study concluded that sexual risk behavior and the chance of contracting infections increase not only among the mobile partners but also to non-migrants partners.

Despite various studies to acknowledge a complex relationship between migration and HIV/AIDS, the context of migration may place individual to risk of acquiring HIV.These studies describe that HIV/AIDS compromises livelihood activities on the pattern of movement. Unfortunately, there is no clear understanding linking between migration and the spread of HIV/AIDS in developing countries like Tanzania. For that reason, in this paper, attempt is made to explore the relation of migration and spread of HIV/AIDS in Tanzania

3. METHODOLOGY

Bivariate logistic regression and bivariate methods employed for analysis in this study. The dependent variable is the HIV infection status classified as an HIV positive and HIV negative. It is not possible to categorize HIV positive case and capture useful information about the trend of migration and HIV/AIDS infections relationship regional wise because the pattern of movement is uneven in the country. For that reason,the study uses the national level data to analyze the linkage between the migrants and non-migrants and the spread of HIV/AIDS. The independent variables include the demographic and household characteristics such as age group, level of education, wealth index, occupation structure, marital status, and sex, place of residence and migration status. Wealth index includes the poorest, middle and richer. The variable represents the assets and income of the household own and earns respectively. The logistic regression applied in analyzing the effects of migration to spread of HIV/AIDS while controlling other variables. HIV/AIDS status is the dichotomous dependent variable where the HIV positive and HIV negative denoted by one and two respectively.

The logistic regression model used appears as follows:

$$\Pr\left(HIV_i = z\right) = \frac{e^{\alpha_k x_i}}{\sum_{k=1}^{k} e^{\alpha_k x_i}}$$

Where HIV_i denote the dependent variable over the defined probability distribution, x_i indicates the set of explanatory variables of the model, α is a regression coefficient, and z is number of possible outcomes.

Since men and women represent differently behaviorally characteristics, occupation and migration perception, and intention, it is suitable to analyze them separately. The age variable is classified into groups of 15-24, 25-34, 35-64 and 65 and above as stated in the integrated labor force survey conducted in the country in 2006. Education variable includes; never attended school, never completed primary

education, completed primary education, and secondary and above. While occupational structure includes not working, agricultural and non-agricultural while marital status represents married and single (never married, divorced/separated and widowed). Migration status and migration streams are considered as an independent variables.

A positive value of the regression means that the independent variables increase the likelihood of the outcome whereas the negative value indicates the decrease of the probability of the outcome. Usually, the probability of the results of the dependent variable is influenced by the dimensional scale of the coefficient of the given explanatory variables. When the regression coefficient value is big implies that the effect of the explanatory variable to the outcome is reliable while the small value means the effect is not significant. The odds ratio (EXP (B)) show the relationship between migration and HIV/AIDS infections. Odds ratio lies between 0 and 1 demonstrate thatin every unit change in the independent variables will cause a change to depend on variable. The odds ratio with value 1 indicate the increases of probability to the outcome (dependent variables) while odds with less than 1 decrease the chance of an outcome.The odds ratio with 1 are neutral implies that the resultmay attain equal chance to occur.

The determination of the direction of causality of HIV status to some independent variables is known to be complex due to reciprocal causality. For example, marital status variable represents the difficulties of determination because the widowhoodmay occur after the death of the infected partner. Also, widowhood associated with loneliness mayallow them to engage in sexual relation with multiple partners, which increases infection rate (Porter et al., 2004; Boileau et al., 2009). In addition, it is more complex to understand the source of infection because married women may have contracted the disease when they were single. Therefore, it is reasonable to interpret the relationship between internal migration and HIV/AIDS infections with multivariate methods than relating the causality. This strategy is paramount in order to capture relevant information regarding migration and HIV/AIDS infections.

This study uses secondary data extracted from Tanzania HIV/AIDS and Malaria Indicator Survey of 2011/2012 collected by the National Bureau of Statistics. The overriding objective is to identify the linkage between the internal migration and HIV infection rate in Tanzania. To fit the model, we measure the magnitude of the HIV infections in the whole process of migration.

4. RESULTS AND DISCUSSION

Table 1 presents the HIV/AIDS prevalence of migrants and non-migrants. The overall spread of HIV/AIDS among the non-migrant is 77.9 percent while for migrants is 22.1 percent. Although, the differences between migration and the spread of the disease is not clear, but when analyzed in sex-wise differencesfor both migrants and non-migrants is significant. For example, the male migrants in relation to HIV/AIDS infections are 10.1 percent while for non-migrants is 38.5 percent. Among the females, the migrants contribute 11.7 percent and non-migrants are 39.4 percent of the overall spread of the infections. These results imply that, even though, the migration is higher among the males, but the relationship between migration and HIV/AIDS prevalence is significantly intense among females.

Table 1. HIV prevalence among migrants and non-migrants by sex

Migration Status	Male (%)	Female (%)	Total (%)
Migrants	(10.4)475	(11.7)531	(22.1)1006
Non-migrants	(38.5)1753	(39.4)1791	(77.9)3544

Migration scholars agree that migration is a highly gendered process. The higher rate of migration among men reflects gendered norms associated with migration. As rural women are usually tied to domestic responsibilities, they are less mobile than their male counterparts (Zhang et., 2022). Also the study concur with Hélène et al., (2010) who conducted a study on the strong association betweenin-migration and HIV prevalence in urban sub-Saharan Africa and found a strong association between recent in-migration and HIV prevalence for women (Pearson R^2 = 57%, $P < 0.001$) and men (R^2 = 24%, P = 0.016), taking the earliest data point for each country. For women, the association was also strong within east/southern Africa (R^2 = 50%, P = 0.003). For both genders, the association was strongest between 1985 and 1994, slightly weaker between 1995 and 1999, and non-existent as from 2000. The overall association for both men and women was not confounded by the developmental indicators GNI per capita, income in-equalities, or adult literacy. Migration explains much of the variation in HIV spread in urban areas of sub-Saharan Africa, especially before the year 2000, after which HIV prevalences started to level off in many countries. The findings suggest that migration is an important factor in the spread of HIV, especially in rapidly increasing epidemics.

Table2 show the percentage distribution of HIV positive cases according to demographic and household characteristics between male and female. A result from the table reveals that the variations of the distribution are statistically significant according to the age group. As a consequence, HIV spread is 34.8,29.5 and 9.1 percent for those aged 35-64, 15-24 and above respectively, implying that women are at high risk contracting the infections in all ages except aged 65 and above.The findings corroborate with the study finding by Mahathir (1997) who noted that although many people believe that mainly men get infected with HIV/AIDS, women are actually getting infected at a faster rate than men, especially in developing countries, and suffer more from the adverse impact of AIDS. As of mid-1996, the Joint UN Program on AIDS estimated that more than 10 million of the 25 million adults infected with HIV since the beginning of the epidemic are women. The proportion of HIV-positive women is growing, with almost half of the 7500 new infections daily occurring among women. 90% of HIV-positive women live in a developing country. In Asia-Pacific, 1.4 million women have been infected with HIV out of an estimated total 3.08 million adults from the late 1970s until late 1994. Biologically, women are more vulnerable than men to infection because of the greater mucus area exposed to HIV during penile penetration. Women under age 17 years are at even greater risk because they have an underdeveloped cervix and low vaginal

mucus production. Concurrent sexually transmitted diseases increase the risk of HIV transmission. Women's risk is also related to their exposure to gender inequalities in society. The social and economic pressures of poverty exacerbate women's risk.

In addition, findings show that the total cases of women account 51.6%. The distribution in education categories shows that 36.1% of those attended primary school but not completed are at higher riskof contracting HIV/AIDS infections. This magnitude is almost similar to those with primary education (33.8%) followed by those never attended (22.1%) while those with secondary and above account (9.1%). The relationship of the respondents attained primary education but not completed with respect to gender indicate that the distribution is slightly different with 18.2% and 17.9% respectively. For that reason, less educated people particular women are more affected by the HIV/AIDS infections.Education is key to an effective response to HIV/AIDS. Studies show that educated women are more likely to know how to prevent HIV infection, to delay sexual activity and to take measures to protect themselves. Education also accelerates behavior change among young men, making them more receptive to prevention messages. The study findings coincide with Charles (2022) who found out that females are less educated compared to males, especially in the developing countries. They, therefore, have limited access to HIV/AIDS information and services, and are less informed about the management of the disease. It is important to note that women, being more affected by HIV/AIDS than men, increase the number of children affected via mother-to-child transmission.

Kayeyi (2009) observed that declines in the HIV prevalence among highly educated persons, particularly in those aged 15-24 years. It is likely that increased information, knowledge and awareness, might have had a positive impact earlier among educated persons than those who were illiterate and poor, in terms of delaying sexual debut, reducing the number of partners, and increasing condom use. Further, educated women are more likely to marry educated men, and as educated men are less likely to engage in risky sexual behaviour and they are less likely to be HIV infected, this probably also has an impact on the HIV risk of educated women.

Table 2. Percentage distribution of HIV positive with respect to household/demographic characteristics by sex

Demographic/household characteristics		Male (%)	Female (%)	Total (%)
Age group	15-24	14.0	15.4	29.5
	25-34	12.4	14.3	26.7
	35-64	17.3	17.5	34.8
	65+	4.7	4.4	9.1
	Total	**48.4**	**51.6**	**100.0**
Level of education	Never Attended	8.8	13.3	22.1
	Primary Not Complete	18.2	17.9	36.1
	Primary Complete	16.9	17.0	33.8
	Secondary above	4.7	3.2	7.9
	Total	**48.6**	**51.4**	**100.0**
Wealth index	Poorer	16.3	17.8	34.2
	Middle	9.7	9.8	19.5
	Richer	22.9	23.4	46.4
	Total	**49.0**	**51.0**	**100.0**
Occupation Status	Not working	8.3	7.7	16.0
	Agricultural	2.2	.9	3.1
	Non-agricultural	39.4	41.4	80.9
	Total	**49.9**	**50.1**	**100.0**
Marital status	Married	19.3	20.0	39.3
	Not married	29.3	31.4	60.7
	Total	**48.6**	**51.4**	**100.0**
Migration Status	Migrants	10.4	11.7	22.1
	Non-migrants	38.5	39.4	77.9
	Total	**49.0**	**51.0**	**100.0**
Migration streams	Rural-Urban	28.9	34.1	63.0
	Town-City	17.0	17.9	34.9
	Rural-rural	1.3	0.8	2.1
	Total	**47.2**	**52.8**	**100.0**

Wealth index is an important variable in measuring the trends of migration to HIV/AIDS prevalence. The richer are more vulnerable to infections with 46.4%, followed by lower level income (poor) with 34.2% and middle-income constitute (19.5%). The pattern is either more or less as observed in the male and female categories because it's very difficult to obtain information related to wealth in the country.

In addition, the percentage distribution of HIV positive cases by occupation is higher in non-agricultural sector group (80.9%) and less to agricultural and not working group. Although the variation in HIV/AIDS prevalence is different with different occupations, but whenobserved insex-wise differences the trend of male (39.9%) and female (44.4%) fall within close range. For married category, there are 39.3 percent of cases whereas for single the trend account 60.7 percent of instances implying that married are less likely to infections compared to single. The study findings are in line with Shisana (2004) who conducted a study of marital status and risk of HIV infection in South Africa and observed that HIV prevalence among married people was 10.5% compared with 15.7% among unmarried (single) people (p-value < 0.001). The risk of HIV infection did not differ significantly between married and unmarried people (odds ratio (OR) = 0.85, 95% confidence interval (CI): 0.71 - 1.02) when age, sex, socio-economic status, race, type of locality, and diagnosis of a sexually transmitted infection (STI) were included in the logistical regression model. However, the risk of HIV infection remained significantly high among unmarried compared with

married people when only sex behaviour factors were controlled for in the model (OR 0.55; 95% CI: 0.47 - 0.66).

Table 2 also depicts the percentage distribution of the HIV positive cases between migrants and non-migrants. Overallfigure at the national level estimate that 22.1 percent of migrants while 77.9 percent cases are in the non-migrant group dominated by females with 11.7%. The study further noted that 63 percent of the cases are in rural-urban migration stream, which is higher compared to other categories in the same group. However, may not represent the reality of the spread of HIV/AIDS in the country without considering the gender distribution. From that ground, resultsshow that 1.3 percent infected with HIV/AIDSoriginated due to movement from rural-rural migration among males and 0.8 percent for females. The migration from rural to urban areas infected with HIV/AIDS reached 28.9 percent.

Table 3 gives the results obtained from logistic regression analysis. The relationship of HIV positive cases and migration streams are statistically significant withrespect to movements from rural-urban and town-city. However, in level ofeducation the probability is significant at the 5 % level for males with less education and insignificant to secondary and above. The linkage between the urban residents and HIV/AIDS infections is statistically significant for both male and female while for the wealth category women are more vulnerable than their counterparts.

Table 3: Results of logistic regression (Odds ratios) for the HIV status among Males and Females by migration status and demographic/household characteristics

Household/demographic characteristics		Male		Female	
		Wald	Exp (B) (N=35323)	Wald	Exp (B) (N=37118)
		21.879		21.524	
Age group	15-24	8.487	0.446	1.16	0.739
	25-34	1.932	0.722	0.133	0.904
	35-64	1.918	0.74	0.817	0.789
Education attained	Never attended	0	0.999	0.374	0.877
	Primary not completed	0.09	1.066	0.413	0.859
	Primary completed	0.367	1.098	4.458	0.689
Wealth index	Poorer	0.009	0.989	1.721	1.178
	Middle	1.647	0.822	0.03	0.973
Occupational	Agriculture	0.252	1.076	1.693	0.82
Place of residence	Urban	3.668	1.331	0.013	1.018
Marital status	Married	0.136	0.948	1.109	0.877
Migration streams	Rural-urban	1.944	0.628	0.716	1.435
	Town-City	0.735	0.742	1.239	1.635

In general, the overall odds ratio evidence to describe the relationship between migration and HIV/AIDS prevalence in the country is weak. In all age groups, females are likely to be affected by the killer disease than males. Men aged 25-34 are not high risk (26.7%) compared to women while educated women/girls are likely to be HIV positive compared to illiterate group. In addition, females who migrate from rural to urban are 2.3 times more liable to HIV/AIDS infection than those who migrated from town to city.These

results support the evidence that the migration streams influence the spread of HIV/AIDS in the regions of Tanzania. The study finding concur with Singh (2015) who found that rural women were significantly more likely to be HIV-infected compared to urban women (OR = 0.612, p<0.00) in Tanzania. About 10% rural women were HIV-infected whereas 5.8% women in urban areas were HIV positive. Women who had more than five sex partners were significantly four times more likely to be HIV-infected as compared to women who had one sex partner (OR = 4.49, p<0.00).

5. CONCLUSIONS AND RECOMMENDATIONS

This study aims to examine the relationship between internal migration and HIV/AIDS infection rate in Tanzania and to suggestthe possible way to overcome the challenges. The study applied multivariate and logistic regression to analyze the determinants of HIV/AIDS prevalence in Tanzania. The dependent variable in this study was HIV/AIDS prevalence classified into two categories (HIV positive and HIV negative). We employed secondary data extracted from the National Bureau of Statistics database in the Tanzania HIV/AIDS and Malaria Indicator Survey 2011/2012. The study found that there are marginal differentials in the HIV prevalence rate between migrants and non-migrants, when considering in sex-wise difference, the trend is substantially significant. The percentage distribution of HIV positive cases with respect to demographic and household characteristics has significant gaps as mentioned from the analysis. The infection is more notable to those with thirty and above years as indicated in the multivariate analysis. Illiterate and less educated people are at higher risk than those attained a high level of education. HIV/AIDS prevalence is observed to be higher in non-agricultural category dominated by females while males account high percentage for non-working group. HIV positive cases are higher for a single in the marital status variable,which including the never married, divorced/separated and widowed. Finally, the HIV infection in the country is higher among the female migrants. Results from bivariate, multivariate and logistic regression support the evidence that there is a strong relationship of demographic, household characteristics and migration streams with an HIV infection rate in the country with high prevalence among the females. Findings also reveal that there is a higher prevalence of HIV/AIDS among non-migrants in the country because more than 80 percent of Tanzanians reside in rural areas. Furthermore, the multivariate results indicate that the migration streams from rural to urban migration is statistically significant implying existence of linkage between internal migration and HIV infection rate. However, in this study the most vulnerable groups such as sex workers and truck drivers were not included because information related to these groups are not available in the survey of THIMS. Although there are other factors, which directly influence the spread of the HIV infection rate in the country, internal migration is shown to be significant to HIV infection rate.

This study has some practical/managerial implications. First, the policy makers and stakeholders must take time to review laws and regulations governing the job market in the country so as to balance migration patterns from employment grounds. The government has recommended formalizing the informal sectors in order to motivate educated and skilled young adults to pursue their professionalism and fulfill their life desires. The government officials are advised to direct investment in rural areas where the population is approximated to be 80% of the country's population. The current trend of investments in the country skewed to urban areas, which primarily attract people from rural to urban seeking employment, better education, health service, and other opportunities.

6. IMPLICATION OF THE STUDY FINDINGS

This manuscript is of significant importance to the scientific community. Findings from the study shed light on the intricate relationship between population movements in Tanzania and the spread of HIV/AIDS. The findings will also inform public health strategies and policies aimed at mitigating the spread of HIV/AIDS, especially in high-mobility contexts. Lastly, the study's findings inform targeted interventions for

specific migrant populations and guide effective resource allocation and program implementation, ultimately leading to more effective control and prevention measures for HIV/AIDS in Tanzania and similar settings. Any form of migration, internal or external, has had a significant impact on the transmission of HIV, hence a lot of truck drivers, migrant mine workers died of HIV/AIDS during the early years of the disease. Most research concentrated on external migrant workers yet internal migration also has a significant impact. Therefore, critical consideration of policies aimed at country level, such as this piece of work from researchers in Tanzania could reduce HIV transmission from these groups.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

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