

## **HIV and socioeconomic characteristics among women in East Africa: Who are the most-at-risk of being HIV-positive?**

### **Abstract**

Though global HIV/ AIDS incidence is declining, HIV/AIDS remains the leading cause of death in women of reproductive age in sub-Saharan Africa, and might prevent the production of the demographic dividend. This paper applies Chi-square Automatic Interaction Detector and Logistic Generalized Estimating Equations models to the 2009-2014 Demographic and Health Survey data conducted in seven Eastern Africa countries (Kenya, Malawi, Mozambique, Tanzania, Uganda, Zambia and Zimbabwe) to examine the predictors, and identifying the most-at-risk of HIV sero-positivity in the region. Overall, marital status is the best predictor of HIV prevalence in the seven countries. The probability of being HIV-positive is higher for widows and divorced. Unlike marital status, the importance of the other significant determinants varies by countries. These findings suggest in-depth and dispassionate discussions on the legalization of commercial sexual work and polygamy in the region. Furthermore, the study provides reliable information for targeted country specific HIV interventions.

## Introduction

African working age population will increase by 2.1 billion in 2100. The rising share of Africa's working age population is increasing its productive potential at a time when most of the advanced economies face an ageing population. This increase in working age population creates a window of opportunity, which if properly harnessed, can translate into higher growth and yield a demographic dividend. Though general HIV prevalence has declined for the past two decades, HIV/AIDS might constitute a barrier to observe the demographic dividend. HIV/AIDS remains the leading cause of death in women of reproductive age in sub-Saharan Africa (SSA). In 2014, 25.8 million people were living with HIV in sub-Saharan Africa, among which more than half were female. On average, there were an estimated 1.4 million new HIV infections in sub-Saharan Africa during the same period.

East Africa is the second most HIV affected in the world after Southern Africa. According to recent estimates from DHS, national HIV prevalence among women of reproductive age is less than 2% in Eritrea, Ethiopia, Madagascar and Mauritius. The prevalence exceeds 10% in Malawi, Mozambique, Zambia and Zimbabwe.

A number of HIV prevention programs have been implemented in sub-Saharan Africa in order to tackle HIV in the region. Large-scale prevention initiatives to contain and reduce HIV/AIDS epidemic, include condom distribution, HIV testing and counseling, preventing mother-to-child transmission, reducing injecting drug use and access to antiretroviral treatment. However, despite substantial progress made, the gap between the current state of HIV/AIDS and the UNAIDS goals of three zero (zero new HIV infections, zero discrimination and zero AIDS-related deaths) remains important.

Given the high cost of HIV/AIDS treatment estimated in 2010 to be globally between US\$22 and US\$24 billion annually and the individual cost of US\$4707 over a lifetime to reach global targets, targeted interventions and evidence-based prevention programs have been advocated as a cost-effective strategy to combat HIV/AIDS. Such a strategy optimizes the coverage, reduce the costs and lower the number of new infections. However, despite growing literature in health and social sciences on factors associated with HIV/AIDS during the last three decades, it is still challenging to precisely identify the most-at-risk groups for HIV especially in countries with high prevalence. Indeed, whereas in countries with concentrated HIV/AIDS epidemics (Latin America, East Asia, Eastern Europe and Western Africa), the most-at-risk populations including Commercial Sexual Workers (CSWs), long distance truck drivers and men who have sex with men (MSM) account for a large proportion of new infections, in countries with high prevalence, they account only for a smaller share of new infections. Furthermore, the profiles of the most at risk populations might results from interaction between several variables and might differ by country.

Against this background, this study aims to identify the socioeconomic predictors of HIV infections and identify the most-at-risk groups among women for better-targeted and cost-effective interventions in seven Eastern African countries, including Kenya, Malawi, Mozambique, Tanzania, Uganda, Zambia and Zimbabwe.

## 2. Data and Methods

The analyses rely on data from the Demographic and Health Surveys (DHS) conducted in East African countries from 2009 to 2014. We selected all countries of the region with at least 5% of HIV prevalence. The database includes 73,930 women aged 15-49.

Statistical analyses include Pearson Chi-square, Logistic General Estimating Equation and Chi-square Automatic Interaction Detector (CHAID). HIV status (Negative or Positive) is the outcome variable. Explanatory variables encompass:

1. Demographic and reproductive behavior variables: age, marital status, and number of unions ever contracted.
2. Socioeconomic and contextual variables: country, region of residence, place of residence, education, and household wealth quintiles.

## 3. Results

On average, 10.7% of women in the seven countries are HIV-positive. The HIV prevalence varies from 5.5% in Tanzania to 18% in Zimbabwe. Table 1 – reports the prevalence of HIV among women (15-49) in the seven countries included in this study.

Table 1 – Prevalence of HIV in East Africa

Country	HIV Prevalence	Number
Kenya	9.9	3,313
Malawi	13.6	6,395
Mozambique	13.6	8,656
Tanzania	5.5	14,598
Uganda	7.0	19,528
Zambia	15.0	16,836
Zimbabwe	18.2	5,500
Total	10.74	74,826

Out of the eight independent variables included in the multivariate model, 7 are statistically associated with the prevalence of HIV. Female education is not statistically associated with the HIV prevalence in the global model.

The cross-country CHAID analysis revealed that marital status was the best predictor of HIV prevalence, followed by the region of residence, number of unions, place of residence, country, age groups and wealth index. The probability of being HIV-positive is higher for widows (34%) and divorced (20%). HIV prevalence is estimated at 10% among women living in union and 6% among those who never contracted a union.

Depending of the marital status category, the models construct 49 HIV risks' profiles from interaction with other variables. Richest widows living in Malawi and Zambia experience the higher HIV prevalence (65%). The prevalence of HIV is estimated at 52% among widows aged 15-39 years, which live in Kenya and Mozambique (52%); and at 50% among Malawian and Zambian widows living in the 4<sup>th</sup> and 3<sup>rd</sup> quintile households. Furthermore, findings revealed that the prevalence of HIV is estimated at 40% among never-married-women aged 35-44 years old living in Mozambique and

Zambia as well as among remarried women living in Mozambique and Zambia; and among women living in Uganda' Central, mid-Northern and South Western regions. By contrast, HIV prevalence is below 1% among women in union living in Zanzibar (Tanzania).

#### **4. Discussions and Conclusion**

This paper aimed to describe and profile HIV prevalence among women in 7 East Africa countries. Analyses suggested three key findings that could be summarized as follows. First, marital status is the best predictor of HIV status among women. Consistent with previous studies (Magadi & Desta, 2011; Adair, 2007), HIV prevalence is higher among women in union dissolution. This probably because: (1) a rich husband or a male partner may have more access to transactional sex and other risk behaviors which may increase women's vulnerability to HIV; (2) wealthier HIV positive widowed might have better quality of life as well as better access to treatment and survive longer; (3) Widows, divorced and separated might be involved in informal risk sexual relationship as survival strategies. However, the cross-sectional nature of the DHS data does not allow determining the direction of the relationships.

Second, these findings raise the ethical, legal, cultural and dispassionate discussions on polygamy and commercial sexual works. Stigmatization of formal commercial sexual workers and polygamy leads to hiding and informal sexual relationships. People involved in such informal relationships might not use the condom under the hypothetical assumption of faithfulness, though they might have multiple/ concurrent partners. Indeed, polygyny and commercial sexual work are considered as harmful cultural practices in the majority of policy discourses, especially among the most educated people living in urban areas. Instead, they are involved in informal relationships. Results from existing studies support that polygamy union systems impede the spread of HIV.

In the light of these findings, it is noteworthy that to achieve zero new infection one of HIV eradication strategy and benefit from the demographic dividend, interventions should be targeted and prioritized according to the prevalence and demographic size of different risk groups. Majority of HIV programs focus on the commercial sexual workers because they are easily identifiable. By opposite, the survival sexual transaction women, including unmarried women (25-49) seem to be ignored because of stigmatization of polygamy in the context of modernity. Like scientists and human right activists are fighting for legalization of abortion for safety, free polygamy might contribute in controlling for sexual network.