Exploratory Study on Factors Associated with Stigmatisation of People Living With HIV/AIDS in Botswana

Arnab R[1], ALABA OO[2] and OLAOMI J. O.[3]

Abstract

Antiretroviral therapy has effectively changed Acquired Immunodeficiency Syndrome (AIDS) from a terminal to a manageable chronic illness. However, People Living with HIV/AIDS (PLWHA) still contend with stigmatisation, hostility and gossip which take their toll on their health and psychological well-being. This paper explores the factors responsible for stigmatisation of PLWHA. The 2008 Botswana Aids Impact Survey III (BAIS III) data was used to assess the attitudes of people to HIV/AIDS patients in Botswana using the generalized additive model. The model was used to simultaneously measure the fixed and nonlinear effects. The fixed effects of categorical covariates were modelled using the diffuse prior while P-spline with second-order random walk was considered for the nonlinear effect of continuous variable. The Binomial distribution was used to handle the dichotomous nature of the three dependent variables considered. The dependent variables considered are family member, teacher and a shopkeeper/food seller who live with HIV/AIDS. This study has shown that people who live in urban areas, educated, married/living together with partner or even divorced and those whose family members are sick with HIV or AIDS are more likely to show discriminatory attitude them.

Keywords: Bayesian inference, binomial, Botswana, generalized additive model, HIV/AIDS

Introduction

Antiretroviral therapy has effectively changed Acquired Immunodeficiency Syndrome (AIDS) from a terminal to a manageable chronic illness. However, People Living with HIV/AIDS (PLWHA) still contend with stigmatisation, hostility and gossip which take their toll on their health and psychological well-being. Botswana is a country in the centre of Southern Africa, sharing borders with South Africa, Namibia and Zimbabwe. The first Acquired Immunodeficiency Syndrome (AIDS) cases in Botswana were diagnosed during the 1980s (Kip et al, 2009). By the end of the 2007, over 300,000 people in Botswana were infected with HIV, with adult prevalence of 23.9 percent (UNAIDS, 2008). Then Botswana became the second highest country affected by HIV in the world after Swaziland, estimated in 2008 to be 17.6% overall (UNAIDS, 2008; Chabrol, 2014; Farahani et al, 2014; Stoneburner et al; 2014). The Antiretroviral (ARV) therapy has effectively changed AIDS from a terminal to manageable chronic illness (Teague, 2007).

[1] Department of Statistics, University of Botswana; email: arnabr@mopipi.ub.bw;

[2] Department of Statistics, University of Ibadan, Nigeria Email: oluwayemisioyeronke@yahoo.com

[3] Department of Statistics, University of South Africa; Email:olaomjo@unisa.ac.za

The ARV therapy known as "Masa" is a Setwana word for a new dawn for People Living with HIV and AIDS (PLWHA) in Botswana (Geiselhart, 2010). Although, Botswana was among the first African countries to introduce HIV intervention programs, PLWHA have an important factor to contend with, which is stigmatisation (Nyblade et al, 2008).

Several studies conducted in sub-Saharan Africa have shown how fear, ignorance and lack of knowledge contributed to the negative attitudes and behaviours towards PLWHA (Nyblade et al, 2008; Akande, 2010; Thupayagale-Tshweneagae, 2010). Stigmatisation is a complex social phenomenon whose persistent occurrence has been described as "black box" and life-altering condition by so many researchers (Geiselhart, 2010; Ogden and Nyblade, 2006; Stuber and Schlesinger, 2006; Nthomang et al, 2009). In Botswana, PLWHA still battle with stigmatisation and discrimination in their interaction with people on daily basis (Letamo, 2004). Stigmatisation, hostility and gossip take their toll on the health and psychological wellbeing of PLWHA (Midtbo et al, 2012). In order to offer palliative care (Kang'ethe, 2010) to PLWHA in Botswana there is a need to identify the factors responsible for stigmatisation and discriminatory attitudes towards them. It cannot be overemphasized that model-based analyses offer an objective outlook to empirical problems in sub-Saharan Africa especially in the absence of reliable national data.

Many researchers have worked on stigmatisation of PLWHA in different contexts; however, this article aims at contributing to existing literature on the set of factors associated with discrimination against PLWHA. This is the focus of this study to help target interventions for reducing stigmatisation suffered by PLWHA in Botswana.

Methods

This was a cross-sectional study using data drawn from Botswana AIDS Impact Survey III (BAIS III) consisting of 459 enumeration areas, 4800 urban areas and 3475 rural areas. The 2008 BAIS is the third sexual behavioural survey and it was conducted under the auspices of the Central Statistics Office Programme of household surveys. The two-stage stratified probability sample design was used for the selection of the BAIS III sample, 8275 households were selected, out of which 7230 households responded which gave a response rate of 87%. In the interviewed households, 17418 persons aged 10 – 64 were found eligible for interview but only 14225 responded which gave a response rate of 82%. The HIV testing participation rate for persons aged 18years above is 67%. This study is based on the survey data with all participant identifiers removed. Although, different covariates were presented in BAIS III 2008, we focused on attitude of people to teachers, shopkeepers and members of family who are living with HIV/AIDS. The covariates considered are: age group, marital status, educational attainment and place of residence. The three dependent variables considered in this study are:

- Dependent 1: If a member of your family became sick with HIV or AIDS, would you be willing to care for him or her in your household?
- Dependent 2: If a teacher has HIV-positive, should s/he be allowed to continue teaching in school?
- Dependent 3: If you knew a shopkeeper or food seller has HIV, would you buy vegetables from him?

The generalized additive model which incorporates both the linear and nonlinear effects of the variables as well as the nature of the dependent variable is considered suitable for this study. Considering the unknown nonlinear effect of metrical or continuous covariates and the

fixed effect of categorical covariates specified as the generalized additive model as expressed below,

$$\hat{\eta}_r = f_1(x_1) + ... + f_k(x_k) + \mu_r^{'}\gamma \qquad (1)$$

where η_r is the semiparametric predictor, $f_1, ..., f_k$ are the unknown nonlinear functions of covariates $x = x_1, ..., x_k$ (usually metrical or time scales), a vector γ of categorical covariates and μ of the fixed effects.

We used the dependent variables as defined in section 2. Each dependent variable follows a binomial distribution whose dependence is modelled through logit link model. Inference was fully Bayesian approach based on Markov Chain Monte Carlo (MCMC) simulation techniques for the unknown posterior distribution. For the continuous/metrical covariates, we assumed Penalized Splines (P-spline) prior with second order random walk to ensure flexibility. A suitable choice of diffuse prior was assumed for the fixed effect parameters (Alaba, Olubusoye and Olaomi, 2015). We used effect coding for the categorical variables. The model was implemented in BayesX version 2.1 (Belitz *et. al.*, 2012).

Results

The results of the three dependent variables considered are given in Tables 1, 2 and 3 respectively. Table 1 gives the posterior estimates of dependent Variable 1 (If a member of your family became sick with HIV/AIDS, would you be willing to care for him or her in your household?).

Table 1: Posterior estimates of dependent Variable 1 within 95% Credible Interval (CI)

Variable	OR	95% CI
Constant	4.2000	(3.1664, 5.7230)
Place of Residence		
Rural (ref)	1.0000	
Urban	1.0982	(1.0048, 1.3516)
Educational Attainment		
No Education (ref)	1.0000	
Primary	1.0935	(0.9177, 1.2956)
Secondary	1.3774	(1.1328, 1.6477)
Higher	1.7919	(1.6280, 1.9978)
Age		
<25 (ref)	1.0000	
25+	1.1497	(1.0093, 1.3756)
Marital Status		
Never Married (ref)	1.0000	
Married/Living Together	2.2458	(1.9465, 2.6338)
Separated/Divorced	1.1139	(0.5726, 2.3432)

Respondents who stay in urban areas [OR: 1.0982, CI: 1.0048, 1.3516] are 9% significantly more likely to stigmatise a family member with HIV/AIDS than those who stay in rural areas at 95% CI. Batswana with primary, secondary and higher education are more likely to

discriminate against a family member who is living with HIV/AIDS than people with no education, although not significant for those with primary education. Household members of age group greater than 25years are 15% significantly more likely to stigmatise other household members living with HIV/AIDS than members who are less than 25 years. Batswana married/living together with partner and separated/divorcees are significantly more likely to discriminate against members of family who are sick with HIV/AIDS more than those who were never married. The posterior estimates showed that those who are living with their partners are the group most likely and significantly to discriminate.

We also considered dependent variable 2 (if a teacher has HIV/AIDS, should s/he be allowed to continue teaching in school?) to assess the level of stigmatisation of PLWHA in Botswana. Table 2 gives a summary of the reactions of Batswana to a teacher who is living with HIV/AIDS.

Table 2: Posterior estimates of Dependent Variable 2 within 95% Credible Interval (CI)

Variable	OR	95% CI
Constant	1.1203	(0.9017, 1.3621)
Place of Residence		
Rural (ref)	1.0000	
Urban	1.0965	(1.0008, 1.2065)
Educational Attainment		
No Education (ref)	1.0000	
Primary	0.8072	(0.7260, 0.9015)
Secondary	1.3696	(1.2210, 1.5334)
Higher	1.8821	(1.5877, 2.2360)
Age		
<25 (ref)	1.0000	
25+	1.1266	(0.9725, 1.3142)
Marital Status		
Never Married (ref)	1.0000	
Married/Living Together	1.8258	(1.6942, 1.9751)
Separated/Divorced	1.5858	(1.0239, 2.3500)

Similar results were obtained on the stigmatisation pattern of Batswana toward a teacher who is infected with HIV/AIDS. Respondents who stay in urban areas [OR: 1.0965, CI: 1.0008, 1.2065] are 9% significantly more likely to disallow a teacher with HIV/AIDS to continue teaching than those who reside in the rural areas. As the Batswana increase in academic knowledge, so is the increase in the level of their discriminatory attitude toward PLWHA. Batswana primary education [OR: 0.8072, CI: 0.7260, 0.9015] are 19% significantly less likely to report that teachers with HIV/AIDS should not be allowed to teach. The respondents with secondary and higher education were significantly more likely to report that teachers sick with HIV/AIDS should not be allowed to teach. People who are well educated have the highest odds of stigmatisation. Respondents who are aged 25 years above were more likely to discriminate against a teacher who is living with HIV/AIDS than people less than 25years, although not significant at 95% CI. Respondents who are married/living together with partner and separated/divorcees were significantly more likely to stigmatise a teacher who is living with HIV/AIDS than those who were never married.

With regard to the dependent variable 3, it was used to explore the stigmatisation level "if you knew a shopkeeper/food seller had HIV/AIDS, would you buy vegetables from them?" The results are summarized in Table 3.

Table 3: Posterior estimates of Dependent Variable 3 within 95% Credible Interval (CI)

Variable	OR	95% CI
Constant	0.7717	(0.6420, 0.9277)
Place of Residence		
Rural (ref)	1.0000	
Urban	1.1472	(1.0324, 1.2668)
Educational Attainment		
No Education (ref)	1.0000	
Primary	0.8960	(0.8092, 1.0165)
Secondary	1.2911	(1.1647, 1.4232)
Higher	1.4924	(1.3007, 1.7104)
Age		
<25 (ref)	1.0000	
25+	1.2886	(1.1701, 1.4383)
Marital Status		
Never married (ref)	1.0000	
Married/Living together	1.5067	(1.0607, 1.9599)
Separated/Divorced	1.3625	(0.7144, 2.4866)

The posterior estimates of the nonlinear effect of age in figures 1, 2 and 3 suggest that discriminatory attitude will be displayed towards a member of family, teacher and shopkeeper who are infected with HIV/AIDS.

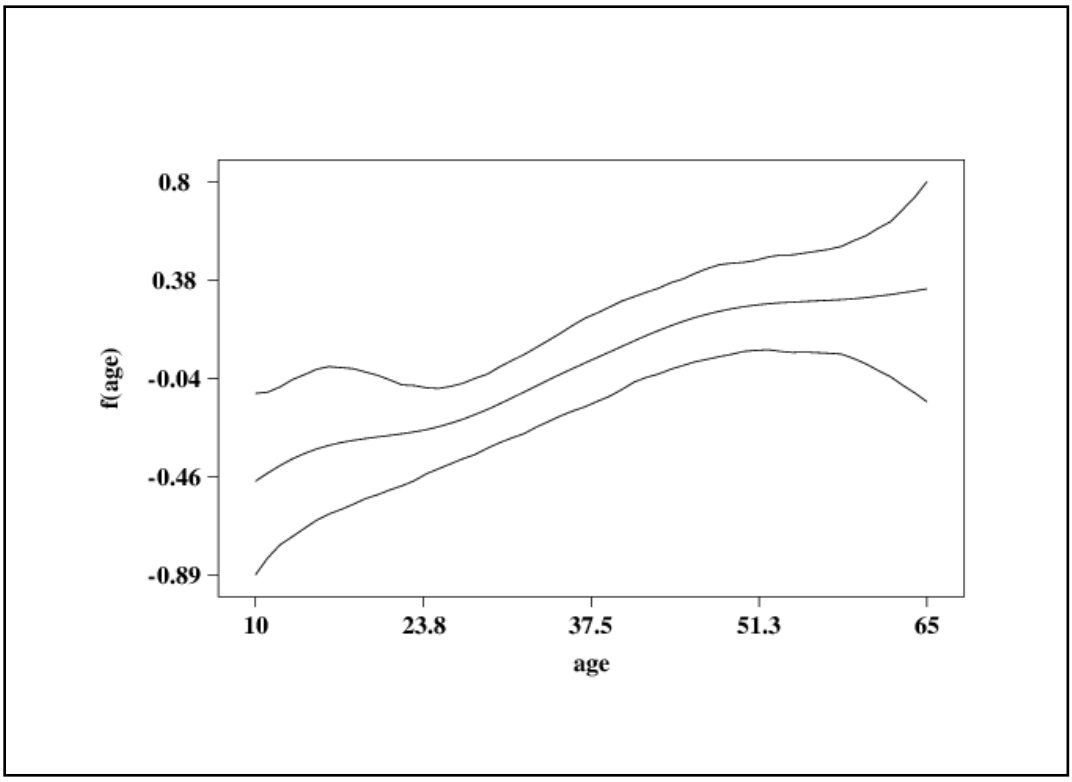

Fig 1: Non-linear effect of age on stigmatisation of a family member who is HIV-positive

The discriminatory attitude towards a family member who is sick with HIV/AIDS is from age group 23^{+} while for a teacher who is sick with HIV/AIDS it is from 23^{+} to 50^{+}. However, there is a decline from age 51 downward. The third dependent variable is a shopkeeper who is sick with HIV/AIDS. Stigmatisation will be more from age group 23^{+} to 50 years old.

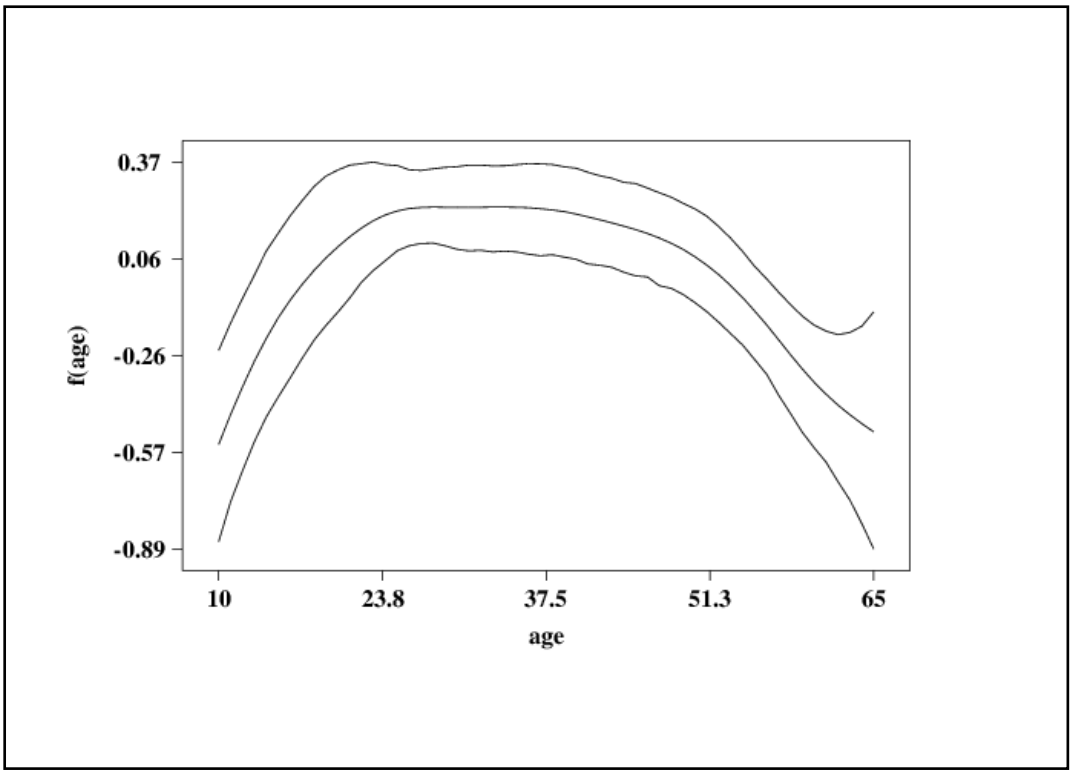

Fig 2: Nonlinear effect of age on stigmatisation of a teacher who is HIV-positive

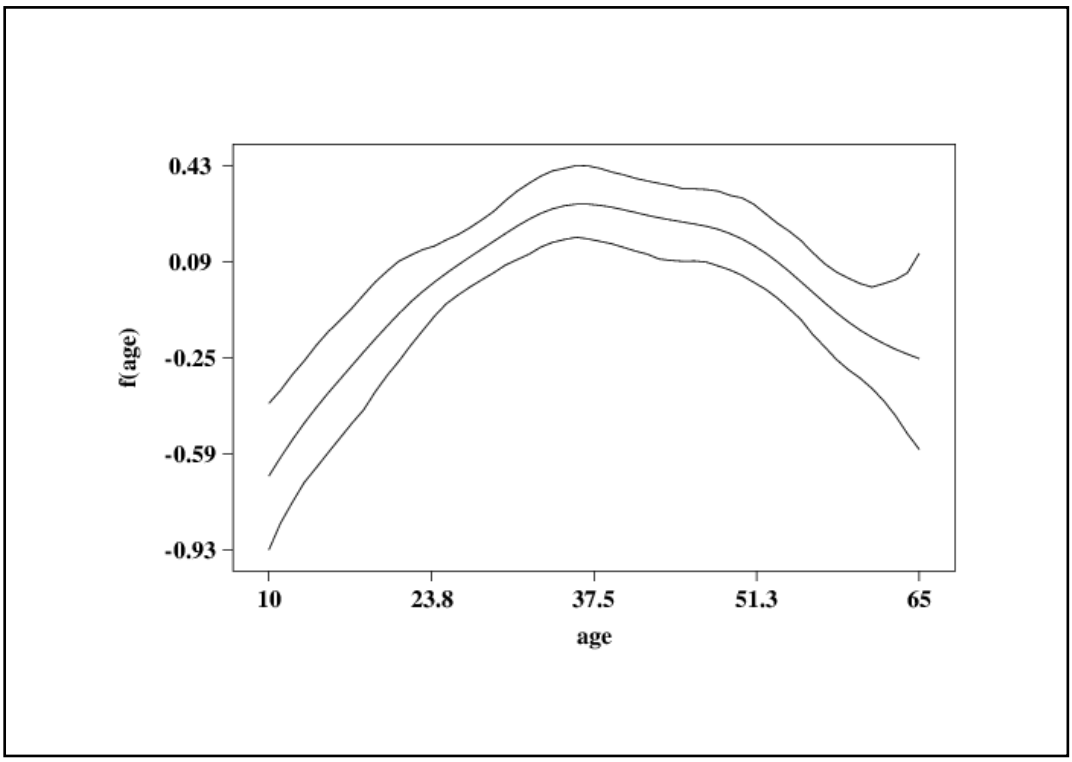

Fig 3: Non-linear effect of age on stigmatisation of an HIV-positive shopkeeper

Discussion

The generalized additive model was used to investigate the factors responsible for stigmatisation of PLWHA. The Binomial distribution was used to handle the dichotomous nature of the three dependent variables considered. The dependent variables are stigmatisation towards family member sick with HIV/AIDS, teacher who has HIV-positive but is not sick and a shopkeeper or food seller who has HIV-positive by using the 2008 BAIS data.

Our findings concur with previous and reports from other settings that respondents who live in urban areas (Yebei, Fortenberry and Ayuku, 2008; Syuhada, Nur and Wong, 2011), who have primary or secondary school education (Bassey *et al*, 2007; Famoroti, Fernandes and Chima, 2013; Cao *et al*, 2014), aged 25^{+} (Cao *et al*, 2014), married/living together with partner or divorced (Chah *et al*, 2014)) ,whose family members are sick with HIV/AIDS are more likely to show discriminatory attitude them. Respondents who are more likely to stigmatise a teacher who is infected with HIV/AIDS but not sick are people who stay in the urban areas, who have secondary or higher education, aged 25^{+}, married or divorced. The third dependent variable considered is whether respondents would buy from a shopkeeper or food seller who is living with HIV/AIDS. People living in the urban area, who have secondary or higher education, aged 25^{+}, married/living together with partner or divorced are more likely to show discriminatory attitude towards a shopkeeper or food seller living with HIV/AIDS.

Conclusion

This study has broadened our knowledge on the factors associated with discriminatory attitudes towards PLWHA in Botswana. It has shown that people who live in urban areas, educated, married/living together with partner or even divorced and those whose family members are sick with HIV or AIDS are more likely to show discriminatory attitude them.

It is hoped that the identified factors will assist in the design of intervention programmes directed towards reducing stigmatisation of PLWHA in Botswana. The findings can be used for developing integrated support tools for the government, health policy makers and international agencies interested in palliative care for PLWHA.

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