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Title: Socio-Demographic Determinants of Accepting Behaviours towards HIV Infected Persons in Nigeria

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Abstract: Stigma and discrimination against persons infected by the Human Immuno-deficiency Virus (HIV) has been reported as one of the major challenges in the care and treatment of persons with HIV infections worldwide. In Nigeria, more than 20percent of the population reported that they have non-accepting attitudes or not sure of their attitudes to HIV infected persons in four situations; care for a family member with HIV or AIDS in their own home; buy fresh vegetables from a shopkeeper with HIV; allow an HIV-positive female teacher to continue teaching; and would not want to keep secret the HIV positive status of a family member and these have contributed to persons with HIV/AIDS keeping their status secret, resulting in continued spread of the disease. Hence, this study examined the socio-demographic determinants of accepting behaviours towards HIV infected persons in Nigeria.

The study applied quantitative method using the individual recode dataset of the nationally representative 2013 Nigeria Demographic Health Survey (NDHS, n=35,818) and data was analysed at the univariate, bivariate and multivariate levels. Simple frequencies were generated for individual variables, bivariate analysis was conducted using the chi-square test of association while the Generalised Linear Model (GLM) was fitted in the multivariate analysis.

Findings from the bivariate analysis showed that region of residence, educational attainment, wealth index, and religion were all associated with accepting behaviours towards HIV infected persons in Nigeria and were fitted into the multivariate model. Multivariate analysis revealed that residence in North East increased the likelihood of accepting behaviour in comparison to other regions. There is a less likelihood of accepting behaviour with increasing educational attainment. Aside respondents in the middle wealth quintile, there was a higher likelihood of accepting behaviour amongst other wealth quintile groups while data showed that type of religion had a significant influence on accepting

behaviour towards HIV infected persons. This study has shown the diverse influence of socio-demographic factors on accepting behaviours towards HIV infected persons in Nigeria. It revealed that while some factors had no pattern of direct influence on accepting behaviours, increasing educational attainment had an inverse relationship with accepting behaviours towards HIV infected persons.

Therefore, HIV prevention, care and treatment education programmes should be collaborative among government, donor partners and community stakeholders. Consideration of all members of the population irrespective of social status or attainment should be done with adequate, appropriate and targeted message or intervention for each social strata.

Socio-Demographic Determinants of Accepting Behaviours towards HIV Infected Persons in Nigeria

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Abstract

Stigma and discrimination against persons infected by the Human Immuno-deficiency Virus (HIV) has been reported as one of the major challenges in the care and treatment of persons with HIV infections worldwide. In Nigeria, more than 20percent of the population reported that they have non-accepting attitudes or not sure of their attitudes to HIV infected persons in four situations; care for a family member with HIV or AIDS in their own home; buy fresh vegetables from a shopkeeper with HIV; allow an HIV-positive female teacher to continue teaching; and would not want to keep secret the HIV positive status of a family member and these have contributed to persons with HIV/AIDS keeping their status secret, resulting in continued spread of the disease. Hence, this study examined the socio-demographic determinants of accepting behaviours towards HIV infected persons in Nigeria. The study applied quantitative method using the individual recode dataset of the nationally representative 2013 Nigeria Demographic Health Survey (NDHS, n=35,818) and data was analysed at the univariate, bivariate and multivariate levels. Simple frequencies were generated for individual variables, bivariate analysis was conducted using the chi-square test of association while the Generalised Linear Model (GLM) was fitted in the multivariate analysis. Findings from the bivariate analysis showed that region of residence, educational attainment, wealth index, and religion were all associated with accepting behaviours towards HIV infected persons in Nigeria and were fitted into the multivariate model. Multivariate analysis revealed that residence in North East increased the likelihood of accepting behaviour in comparison to other regions. There is a less likelihood of accepting behaviour with increasing educational attainment. Aside respondents in the middle wealth quintile, there was a higher likelihood of accepting behaviour amongst other wealth

quintile groups while data showed that type of religion had a significant influence on accepting behaviour towards HIV infected persons. This study has shown the diverse influence of socio-demographic factors on accepting behaviours towards HIV infected persons in Nigeria. It revealed that while some factors had no pattern of direct influence on accepting behaviours, increasing educational attainment had an inverse relationship with accepting behaviours towards HIV infected persons. Therefore, HIV prevention, care and treatment education programmes should be collaborative among government, donor partners and community stakeholders. Consideration of all members of the population irrespective of social status or attainment should be done with adequate, appropriate and targeted message or intervention for each social strata.

Keywords: Nigeria Demographic and Health Survey (NDHS), Socio-Demographic Determinants, Accepting Behaviours, HIV, Nigeria

Background

UNAIDS, the United Nations Program on HIV/AIDS reported in 2015 that there were over 30 million people living with the disease around the world (UNAIDS, 2016). Although less than 3percent of the Nigerian population are living with HIV/AIDS and the country does not lie among the leading countries in sub-Saharan Africa in terms of new infections and people on treatment but the epidemic has remained a major public health and socio-economic issue in-country. However, it is important to note that by absolute number of infected people, Nigeria is behind only South-Africa and India (Monjok, Smesny, & Essien, 2009). Individuals living with this disease in many parts of the world including Nigeria are faced with a number of challenges including discriminatory attitudes towards them, stigmatization and poor access to ART. HIV/AIDS is a highly stigmatized disease in Nigeria and many other countries of the world especially the less developed countries and this has been a great problem for health practitioners and other stakeholders (Adebimpe, Akindele, & Mabayoje, 2014; Li et al., 2017). The Joint United Nations Programme on HIV/ AIDS (UNAIDS) has said that discrimination follows stigma, and defined

it as the unfair and unjust treatment of an individual based on his or perceived HIV status, discrimination is a type of stigma towards people living with HIV/ AIDS, which can be defined as experiences of stigma (enacted stigma), or prejudicial attitudes and behavior based on their HIV status, such as isolation, exclusion, rejection or harm by other people in the community (Wariki, Nomura, Ota, Mori, & Shibuya, 2013). Stigma and discrimination remain intractable challenges in addressing the epidemic (Corno & de Walque, 2013; Dahlui et al., 2015; Malcolm et al., 1998; Monjok et al., 2009; Nkansa-Kyeremateng & Attua, 2013; Shodimu et al., 2017; Ulasi et al., 2009; Unnikrishnan, Mithra, Rekha, & Reshmi, 2010), this is because HIV-related stigma may compromise treatment, care and support for PLHIV. Data from population-based surveys suggest that discriminatory attitudes towards people living with HIV have declined slowly, but progress has been uneven across countries and between men and women. In approximately half of the countries with available data between 2009 and 2014, over 50percent of women and men aged 15-49 years reported they would not buy vegetables from a shopkeeper living with (UNAIDS, 2016). In Nigeria for instance, more than twenty percent of the population reported that they have non-accepting attitudes or not sure of their attitudes to HIV infected persons in four situations; care for a family member with HIV or AIDS in their own home; buy fresh vegetables from a shopkeeper with HIV; allow an HIV-positive female teacher to continue teaching; and would not want to keep secret the HIV positive status of a family member.

Despite the seeming progress that has been made, HIV stigma and discrimination are major issues affecting people living with HIV/ AIDS (PLWHA) in their everyday lives (Jain et al., 2013). Given that non-acceptance and discrimination towards HIV/AIDS infected people determines the trajectory of the epidemic, there is need to better understand the socio-demographic determinants of accepting behaviours towards HIV infected persons in Nigeria in order to inform interventions and programmes to improve accepting behaviours towards PLWHIV, also understanding the socio-demographic determinants of accepting behaviour towards people living with HIV could help in designing effective interventions which may be key

in reducing non-acceptance and stigma towards people living with HIV, which could help ensure successful reversal of the AIDS epidemic (Ulası et al., 2009).

Previous literatures have explored the socio-economic and demographic factors associated with as well as provide understanding of HIV stigma, discrimination and accepting behaviours towards people living with HIV/ AIDS (Castro & Farmer, 2005; Corno & de Walque, 2013; Dahlui et al., 2015; J. T. F. Lau & H. Y. Tsui, 2005; Lohmann, Tam, Hopman, & Wobeser, 2009; Ulası et al., 2009), some studies have found education to be associated with HIV stigma (Bekalu, Eggermont, Ramanadhan, & Viswanath, 2014; Ulası et al., 2009), it was found that people with lower education exhibited one form of stigma or the other. Wealth index/ social affluence has also been found to be associated with HIV stigmatizing attitudes, (Brinkley-Rubinstein & Craven, 2014) found that those who are more affluent are more likely to have stigmatizing attitudes about people living with HIV. Age to be positively associated with HIV stigma while religion (Catholic) has been found to be negatively associated (Corno & de Walque, 2013; Li et al., 2017). In other studies, especially on the influence of sex, males were more likely than females to have higher social acceptance attitudes toward PLHIV (Chiao, Mishra, & Sambisa, 2008a). In the work of (Ulası et al., 2009), it was found that discrimination also exists in the work place This present study will seek to depart from previous studies on HIV in Nigeria, by exploring the socio-demographic determinants of accepting behaviours towards HIV infected persons in Nigeria. In addition, it will also provide the needed information for programmers and policymakers as well as inform the design of best interventions towards the improvement of accepting attitudes towards people living with HIV/AIDS.

Methods

Data Source

The study utilized data from the 2013 Nigeria Demographic Health Survey (NDHS, n=38,756).

The NDHS is a cross sectional nationally representative survey conducted by the National

Population Commission with technical assistance from ICF International where data is collected on various demographic and health indicators.

Data analysis

The data in the study was analysed using Stata 13. This analysis was conducted at the univariate, bivariate and multivariate levels. Simple frequencies were generated for the selected socio-demographic variables; bivariate analysis was conducted using the chi-square test of association to test the association between the selected socio-demographic variables and acceptance behaviour towards HIV infected persons while the multinomial logistic regression was fitted into the multivariate analysis to determine the socio-demographic factors that influenced accepting behaviours towards HIV infected persons in Nigeria. In the multivariate analysis, the multinomial logistic regression was applied for two purposes; the first one involved applying unadjusted multinomial logistic regression coefficients to examine the separate bivariate relationship between “No” and “Yes” and the explanatory variables, secondly, the relative risk ratios (RRR) were applied to examine the multivariate relationship between “No”, “Yes”, “Don’t know/ Not sure/ It depends” and selected socio-demographic variables.

Outcome variable

The main outcome variable for this study was labelled “accept”, derived from the combination of three variables from the dataset, the dependent variable has three categories namely; No, Yes and Don’t know/ Not sure/ It depends coded 1, 2 and 3 respectively.

Explanatory Variables

The explanatory variables selected for the study based on reviewed literature include; sex of household head, region, type of place of residence, level of education, wealth index.

Description of the model

The dependent variable being current contraceptive use has three possible outcomes, namely non-use, using traditional method and using modern method. These outcomes are unordered, coded 1, 2 and 3 respectively, and recoded in y notation. The explanatory variables are recorded in X notation. Three coefficients corresponding to each of the possible outcome of the dependent variable, that is $(\beta(1), \beta(2), \beta(3))$, are to be estimated. The mathematical expression for estimating the coefficients are stated below:

$$\Pr(y=1) = \frac{e^{X\beta(1)}}{e^{X\beta(1)} + e^{X\beta(2)} + e^{X\beta(3)}}$$

$$\Pr(y=2) = \frac{e^{X\beta(2)}}{e^{X\beta(1)} + e^{X\beta(2)} + e^{X\beta(3)}}$$

$$\Pr(y=3) = \frac{e^{X\beta(3)}}{e^{X\beta(1)} + e^{X\beta(2)} + e^{X\beta(3)}}$$

It is important to at this point explain the mathematical notations above, the mathematical expressions will be unidentified because it will result in the same probabilities for each of the three possible outcomes we have set out in this study. To identify the expression, outcome 2 (using yes i.e. acceptance of people living with HIV) was selected as the base outcome. Based on this, the changes in outcomes (no i.e. non-acceptance) and 3(don't know/ not sure/ it depends) will be measured relative to outcome 2 (acceptance). The mathematical expression was thus modified

The expression will however be unidentified because it will result in the same probabilities for each of the three possible outcomes. To make the expression identifiable, outcome 2 (using traditional method) was selected as the base outcome. By this selection, change in outcome 1 (non-use) and outcome 3 (using modern method) will be measured relatively to outcome 2. The expression was thus modified as:

Fitting the model

The Stata mlogit command was used to fit the multinomial logistic regression. The logistic regressions were estimated using the relative risk ratio (RRR). The RRR measures the change in outcome 1 and outcome 3 in relation to the base outcome (2) and was derived from the relative probability of each outcome to the base outcome (Solanke & Lukman, 2017), that is:

$$\frac{\Pr(y=1)}{\Pr(y=2)} = e^{\chi\beta(1)} \text{ and } \frac{\Pr(y=3)}{\Pr(y=2)} = e^{\chi\beta(3)}$$

The multinomial logistic regression was replicated in four models. Model 1 was based solely on the demographic variables, while model 2 was based solely on the socio-economic variables. In model 3, the demographic and socio-economic variables were combined. Model 4 was the full model which included all variables including the control variables.

Results

Table 1: Distribution of respondents by selected socio- demographic characteristics and accepting behaviour

Accepting Behaviour	Frequency	Percent
No	4740	13.23
Yes	28098	78.45
Don't Know/Not sure/Depends	2980	8.32
Sex of HH		
Male	29626	82.42
Female	6317	17.58
Region		
North-Central	4633	12.89
North-East	5050	14.05
North-West	11301	31.44
South-East	4420	12.30
South-South	4636	12.90
South-West	5902	16.42
Type of Place of Residence		
Urban	16345	42.18
Rural	22409	57.82
Level of Education		
No Education	14648	37.79
Primary	6708	17.31
Secondary	13682	35.77
Higher	3539	9.18
Wealth Index		
Poorest	7086	18.28

Poorer	7405	19.11
Middle	7448	19.22
Richer	7946	20.50
Richest	8870	22.89
Religion		
Catholic	3952	11.08
Other Christians	14865	41.68
Islam	16591	46.52
Traditional	260	0.73

The table above shows the distribution of the respondents by selected socio-economic and demographic characteristics; the analysis on accepting behaviour of the respondents reveals that less than 14 percent of the respondents reported non-acceptance behaviours towards HIV infected persons, 78 percent of the respondents reported acceptance of HIV infected persons while the remaining 8 percent either do not know, are not sure or feel that their acceptance of HIV infected persons depends on the situation. The analysis further revealed that 82 percent of the respondents are from male headed households while less than 18 percent are from female headed households. Regional distribution of the respondents showed that about 13 percent of respondents are from the North Central, 14 percent from the North East, the highest proportion of 31 percent are from the North West while 12 percent, about 13 percent and 16 percent are from the South East, South South and South West respectively.

Furthermore, the distribution of the respondents showed that more than half of the respondents reside in the rural areas (58 percent) and the percentage residing in the urban areas are 42 percent. Education attainment levels show that 38 percent of the respondents were not formally educated, 17 percent had primary education, secondary education was reported by 36 percent of respondents while the proportion with higher/ tertiary education were less than 10 percent. The

distribution of the respondents by household wealth index revealed that almost 44 percent of respondents were from rich households' middle households which accounted for are less than 19 percent while 37 percent were from poor households. Finally, the distribution of the study respondents by religion shows that close to half are Muslims (46percent), a little over two-fifth are other Christians, less than 12 percent are catholic and those who are traditionalists or other religions are less than 1 percent of the respondents.

Table 2: Chi-square test of association between selected socio-demographic characteristics and accepting behaviour towards HIV Infected persons in Nigeria

Variables	No	Yes	Don't know/ Not sure/ It depends
Sex of Household Head			
Male	3527 (11.97)	23474 (79.13)	2625 (8.91)
Female	975 (15.48)	4840 (76.86)	483 (7.66)
$\chi^2=63.50 \quad p=0.000$			
Region of residence			
North-central	282 (6.13)	3886 (84.62)	425 (9.25)
North-East	605 (12.02)	3831 (76.11)	597 (11.87)
North-West	851 (7.56)	9413 (83.67)	987 (8.77)
South-East	604 (13.72)	3596 (81.65)	204 (4.63)
South-South	640 (13.91)	3617 (78.57)	346 (7.52)
South-West	1520 (25.82)	3818 (64.86)	549 (9.33)
$\chi^2=1565.77 \quad p=0.000$			
Type of place of residence			
Urban	1949 (12.29)	13061 (79.29)	1335 (8.42)
Rural	2553 (12.82)	18084 (78.28)	1772 (8.9)
$\chi^2=5.48 \quad p=0.532$			

Level of Education			
No Education	1536 (12.27)	9645 (77.09)	1331 (10.64)
Primary	1021 (16.4)	4698 (75.46)	507 (8.14)
Secondary	1750 (12.94)	10885 (79.31)	1047 (7.75)
Higher	195 (5.56)	3097 (88.1)	223 (6.34)
$\chi^2=356.34$ $p=0.000$			
Wealth Index			
Poorest	930 (15.45)	4470 (74.30)	616 (10.25)
Poorer	781 (11.84)	5186 (78.63)	629 (9.53)
Middle	874 (12.84)	5438 (79.91)	493 (7.25)
Richer	1051 (13.78)	5896 (78.51)	578 (7.71)
Richest	867 (9.93)	7081 (81.11)	782 (8.95)
$\chi^2=169.50$ $p=0.000$			
Religion			
Catholic	448 (10.66)	3499 (83.29)	254 (6.05)
Others Christians	1852 (13.95)	11862 (77.38)	1151 (8.67)
Islam	2122 (11.77)	12800 (78.97)	1669 (9.26)
Traditionalists/ Others	80 (29.69)	157 (57.94)	33 (12.37)
$\chi^2=177.66$ $p=0.000$			

In the bivariate analysis, the result of the chi-square test of association revealed that there is a significant association between all the selected socio-demographic variables and accepting behaviours towards HIV infected persons in Nigeria except for type of place of residence. Results from the table revealed that among respondents from male headed households, about 80 percent reported accepting behaviours while 12 percent reported otherwise, with the remaining 8 percent being undecided about what they will do in such situations. For female headed

households, almost the same pattern was observed as majority, about 77 percent of the respondents were positive on accepting behaviours towards HIV infected person, with 15 percent reporting non-accepting behaviours and 8 percent undecided. Considering region of residence, the bivariate analysis revealed that the highest proportion of respondents with accepting behaviour were in the North Central (85 percent) while the least proportion were in the South West region of the country (65 percent). Regarding type of place of residence, about 80 percent of urban dwellers reported accepting behaviours, with 12 percent stating otherwise. In the rural areas of the country, 78 percent of the respondents said “Yes” to accepting attitude towards HIV infected persons while less than 13 percent said “No”.

Furthermore, by level of education, it was observed that increasing educational level led to increasing accepting behaviours towards HIV infected persons. This was also observed by wealth index as the lowest proportion of respondents with non-accepting behaviours towards HIV infected persons were from the rich category while the respondents in the poor category had the highest proportion of respondents with non-accepting behaviours. It also among the richest people in the study population that the highest percentage claimed to be undecided in their attitude towards HIV infected persons (81percent). The result of the bivariate analysis also revealed traditionalists had the highest proportion of respondents with non-accepting behaviours while Catholics (83 percent) reported accepting behaviours towards HIV infected persons followed by Muslims before other Christians.

It is important to note that all the independent variables were found to be significantly associated except the type of place of residence and all the variables were included in the multivariate analysis using the multivariate logistic regression.

Table 3: Relative Risk Ratio Showing the Influence of socio-demographic factors on Accepting Attitudes towards HIV/AIDS Infected Person (non-Acceptance: No; Acceptance: Yes, As Base Outcome)

Characteristics predicting non-accepting behaviour towards HIV/AIDS infected persons	RRR	p > z 	95percent CI
Sex of household head			
Male (ref)	-	-	-
Female	1.077	0.200	0.961-1.206
Region			
North-central (ref)	-	-	-
North-East	1.028	0.819	0.806-1.314
North-West	0.554**	<0.005	0.432-0.710
South-East	3.640**	<0.005	2.874-4.609
South-South	4.068**	<0.005	3.223-5.137
South-West	10.561 **	<0.005	8.496-13.128
Type of place of residence			
Urban (ref)	-	-	-
Rural	1.106	0.204	0.947-1.291
Level of Education			
No Education (ref)	-	-	-
Primary	0.807**	<0.005	0.696-0.935
Secondary	0.608**	<0.005	0.521-0.709
Higher	0.259**	<0.005	0.200-0.336
Wealth Index			
Poorest (ref)	-	-	-
Poorer	0.576**	<0.005	0.469-0.707

Middle	0.414**	<0.005	0.337-0.509
Richer	0.334**	<0.005	0.264-0.422
Richest	0.213**	<0.005	0.162-0.280
Religion			
Catholic (ref)	-	-	-
Other Christians	1.108	0.291	0.916-1.340
Islam	1.509**	<0.005	1.208-1.884
Traditionalists	2.493**	<0.005	1.719-3.615
RC= Reference Category Significance= ** (P<0.05) Source: Author, 2017			

The table above presents the multivariate analysis of factors influencing attitude towards people living with HIV/AIDS. The result revealed that not all the variables put into the analysis were significantly associated with accepting attitude towards people living with HIV/AIDS, the expected risk of non-acceptance of people living with HIV/AIDS was higher for women than men (RRR= 1.08; CI: 0.96-1.21). Type of place of residence did not reveal significant influence on attitude toward people living with HIV/AIDS in Nigeria. As the level of education increases from no education to primary education, the expected risk of non-acceptance of HIV/ AIDS infected persons relative to acceptance decreased significantly by a factor of 0.81 (RRR=0.81; CI: 0.70-0.93) and by a factor of 0.61 (RRR=0.61; CI: 0.52-0.71) for secondary education. At higher level of education, a further decrease by a factor of 0.26 (RRR=0.26; CI: 0.20-0.34) was observed. As the household wealth increases, the expected risk of non-acceptance of HIV/AIDS infected persons reduced significantly by a factor of 0.58 (RRR=0.58; CI: 0.47-0.71), the risk of non-acceptance relative to acceptance of HIV/AIDS infected persons for those from the richer households reduced by a factor of 0.334 (RRR=0.334; CI: 0.264-0.422) while for those in the richest households, the risk of non-acceptance relative to acceptance reduced by a factor of 0.213 (RRR=0.213; CI: 0.162-0.280). Lastly, for the influence of religion, the risk of non-acceptance relative to acceptance by other Christians compared to the Catholics increased by a factor of 1.108 (RRR=1.108; CI: 0.916-1.340), for the Muslims, the expected risk of non-acceptance

relative to acceptance increased by a factor of 1.509 (RRR=1.509; CI: 1.208-1.884), the relative risk of non-acceptance of HIV/ AIDS relative to acceptance of infected persons by traditionalists increased by a factor of 2.493 (RRR=2.493; CI: 1.719-3.615).

Table 4: Relative Risk Ratio Showing the Influence of Socio-demographic on Uncertainty (Don't Know/ Not Sure/ It Depends) of Attitude towards HIV/AIDS Infected Persons

Characteristics predicting non-accepting behaviour towards HIV/ AIDS infected persons	RRR	p > z 	95percent CI
Sex of household head			
Male (ref)	-	-	-
Female	0.996	0.962	0.856-1.160
Region			
North-central (ref)	-	-	-
North-East	1.240	0.198	0.893-1.722
North-West	0.813	0.287	0.555-1.190
South-East	0.529	<0.005	0.393-0.712
South-South	0.864	0.223	0.647-1.107
South-West	1.289	0.055	0.995-1.670
Type of place of residence			
Urban (ref)	-	-	-
Rural	0.909	0.372	0.738-1.120
Level of Education			
No Education (ref)	-	-	-
Primary	0.687	<0.005	0.559-0.845
Secondary	0.569	<0.005	0.464-0.698
Higher	0.354	<0.005	0.276-0.454
Wealth Index			
Poorest (ref)	-	-	-
Poorer	0.945	0.699	0.710-1.259

Middle	0.784	0.114	0.580-1.061
Richer	0.904	0.562	0.641-1.273
Richest	1.076	0.691	0.749-1.545
Religion			
Catholic (ref)	-	-	-
Other Christians	1.272	<0.005	1.036-1.561
Islam	0.918	0.562	0.686-1.228
Traditionalists	1.806	<0.005	1.078-3.025
RC= Reference Category Significance= ** (P<0.05) Source: Author, 2017			

The table above shows the influence of selected socio-demographic characteristics on uncertainty of attitude towards HIV/AIDS infected persons in Nigeria. The focus is on those that reported being uncertain (don't know/not sure/it depends) with acceptance as the base outcome. By household head, the risk of don't know/not sure/it depends relative to acceptance reduced by a factor of 0.996 for those with female heads of household (RRR= 0.996; CI: 0.856-1.160). Looking at the influence of region of residence, the risk of don't know/not sure/it depends relative to acceptance was higher by a factor of 1.240 (RRR=1.240; CI: 0.893-1.722) for those in the North-East compared to those living in the North-Central region of the country, the risk reduced by a factor of 0.813 (RRR=0.813; CI: 0.555-1.190) for those living in the North-West compared to those in the North-Central. Also, looking at the influence of region of residence, compared to those living in the North-Central region, the risk of don't know/not sure/it depends relative to acceptance of people living with HIV significantly reduced by a factor of 0.529 (RRR=0.529; CI: 0.393-0.712), the relative risk further reduces by a factor of 0.864 (RRR=0.864; CI: 0.647-1.107). The risk of don't know/not sure/it depends relative to acceptance of people with HIV increased by a factor of 1.289 (RRR=1.289; CI: 0.995-1.670). The expected risk of don't know/not sure/it depends relative to acceptance for rural dwellers compared with those in the urban areas reduced by a factor of 0.909 (RRR=0.909; CI: 0.738-1.120). As the level of education improves, the expected risk of don't know/not sure/it depends

relative to acceptance reduced consistently. Specifically, the risk reduced by a factor of 0.687 (RRR=0.687; CI: 0.559-0.845) for those with primary education compared to those with no education, for those with secondary education, compared those with no education, the risk reduced by a factor of 0.569 (RRR=0.569; CI: 0.464-0.698), the risk ratio further reduced by factor of 0.354 for those with higher education compared to those with no education (RRR=0.354; CI: 0.276-0.454).

Furthermore, looking at the influence of wealth index on accepting behavior, the expected risk of uncertainty for those from the poorer households compared to those from the poorest households reduced by a factor of 0.945 (RRR=0.945; CI: 0.710-1.259), the expected risk of don't know/not sure/it depends relative to acceptance for those from the middle households reduces by a factor of 0.784 (RRR=0.784; CI: 0.580-1.061). In the same vein, the expected risk of don't know/not sure/it depends relative to acceptance for those from the richer households compared to those from the poorest reduced by a factor of 0.904 (RRR=0.904; CI: 0.641-1.273), the expected risk of uncertainty for those from the richest households compared to those from the poorest households increase by a factor of 1.076 (RRR=1.076; CI: 0.749-1.545). For religion, compared to the Catholics, the expected risk of don't know/not sure/it depends relative to acceptance for the other Christians significantly increased by a factor of 1.272 (RRR=1.272; CI: 1.036-1.561), the expected risk of uncertainty for adherents of Islam compared to the Catholics reduced by a factor of 0.918 (RRR=0.918; CI: 0.686-1.228), the expected risk of don't know/not sure/ it depends relative to acceptance of people living with HIV significantly increases by a factor of 1.806 for traditionalists compared to Catholics (RRR=1.806; CI: 1.078-3.025).

Discussion

The study has demonstrated that discriminatory attitude towards people living with HIV/AIDS is common in Nigeria, this is consistent with the findings of (Monjok et al., 2009) in a mini review of HIV related stigma and discrimination in Nigeria, where it was reported that negative attitudes of PLWHAs among the population are some of the most common manifestations of AIDS stigma, which potentially leads to discrimination and that there is great fear of HIV/AIDS in the population and this might be due to the poor understanding of the disease process in the Nigerian population. Another study in Hong-Kong also found discriminatory attitude towards PLWHAs is high (J. Lau & H. Tsui, 2005) amongst the general population. This study found that individuals in female headed households were more likely to discriminate or stigmatize people living with HIV/AIDS than men do. This findings lends credence to the findings of (Chiao, Mishra, & Sambisa, 2008b) where a national population based survey of individual and community level determinants of social acceptance of people living with HIV/AIDS in Kenya were discrimination and stigmatization was found more in female headed households. The study also found that a significant relationship between religion and accepting behaviours towards HIV infected persons in Nigeria. This is in contrast with the findings from a study in Kandy area in Sri Lanka where it was found that no significant relationship exists between religion and the attitudes towards PLHIV (Navaratna et al., 2014) and also with what (Shodimu et al., 2017) found in their study on perceived stigmatization and discriminatory attitudes towards people living with HIV in Nigeria, where it was found that religion did not achieve statistical significance for perceived stigmatization. Our findings also reveal that level of education is also significantly related to uncertainty. This support the work of (Chiao et al., 2008b) where their study in Kenya found that there was a significant relationship between education and accepting attitude towards people living with HIV even after adjusting for the effects of other individual and community-level variables. Also, it is consistent with the findings of (Bekalu et al., 2014) in a study of the

effect of media use on HIV related stigma in sub-Saharan Africa where it was found that HIV-related stigma tends to be higher among people with low educational attainment than among those with high educational attainment. Also, the findings of this study is supported by the findings of (Shodimu et al., 2017) where it was suggested that after receiving an intervention, there was increase in the proportion of women showing less stigmatizing and discriminatory attitudes towards people living with HIV. A plausible explanation for the finding in this study could be that exposure increases access and exposure to information on health and social issues which have a direct bearing on attitudes towards HIV/AIDS infected persons.

Conclusions

This present study examined the socio-demographic determinants of accepting behaviours towards HIV infected persons in Nigeria. The study utilized a secondary data form the 2013 Nigeria Demographic and Health Survey. Findings of the study has revealed that region of residence, level of education, wealth index and religion were significantly associated with accepting attitudes towards HIV infected persons in Nigeria. There were reported uncertainty of attitudes towards HIV infected persons which were regions of residence, level of education and religion.

From the findings of this study, it is important that concerted efforts should be focused on educating people especially the those with no or low level education on HIV/ AIDS and associated stigma and it also means that programmatic efforts that disseminate information on HIV as well as efforts to stem or reduce HIV related stigma or negative attitudes towards people living with HIV should consider the various groups of socio-demographic linings to ensure appropriate messages are developed and communicated to each group. There is also need for collaborative efforts between government, partners and community stakeholders to identify a line of action which addresses the problem of discrimination and stigmatization towards HIV infected persons in Nigeria.

Further, due to the cross sectional nature of the DHS data utilized in the study and the fact that some of the measures of the DHS data are quite limited, the measurement of accepting behaviour is limited and not many studies have presented the phenomenon like we have in this study, which is likely to have limited the possibility of capturing robust relationships (Bekalu et al., 2014). Hence, further studies especially utilizing a qualitative approach would better dissect the factors associated with accepting behaviours towards people living with HIV.

Conflict of Interest

The authors have not declared any conflict of interest

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Ethical Consideration

The Nigerian DHS data used for the study was downloaded from the website of MEASURE DHS after a written request was submitted to the DHS ICF MACRO and permission was granted to use the data for this research.

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