

Analysis Of Socio-Economic Burden of Onchocerciasis in Amur Community in Imo State, Nigeria

Okechukwu Odinaka

Department of Sociology, Imo State University, Nigeria.

Abstract

The aim of this study was to analyse the socioeconomic burden of onchocerciasis in Amur community in Imo State, Nigeria. Mixed methods research was conducted using questionnaire and in-depth interview data collection instruments. The data were analyzed using descriptive (frequency tables) and inferential (logistic regression analysis) statistics. Ethical principles of informed and voluntary consent, confidentiality, non-injury, and beneficence were fully observed throughout the data collection process. It was found that majority of the people avoid onchocerciasis infected persons because they feel that the disease may be infectious. Peer isolation, poverty, poor school attendance and reduced productivity were major socio-economic burdens faced by onchocerciasis infected persons in Amur community. It was also found that awareness of socioeconomic consequences of onchocerciasis such as medical spending, man hour loss, unemployment, academic performance, poverty and social esteem affect the decision of infected persons to participate in the disease preventive and control programmed. In conclusion, awareness of socioeconomic consequences of the diseases on individuals and the community is important to motivate people to participate in the disease preventive and control programmed in Amur community.

Keywords: onchocerciasis; socioeconomic; burden; analysis; amuru

Background

With an estimated annual burden of 388,576 disability adjusted life years (DALYS) (WHO, 2012), onchocerciasis is attributed to three morbidity (nodules, leopard skin and rashes) indicators. It has been attributed to cases of blindness, visual impairment, Musculo-skeletal pains, epilepsy, spontaneous abortion, lactation difficulties, infertility and sterility (Noma et al., 2014; Ronald & Okonkwo, 2017). Onchocercid blindness is the world's fourth leading cause of preventable blindness after cataract, glaucoma and trachoma (FMOH, 2017). In 2009, an approximate 270,000 people were blind globally and 500,000 had significant visual loss directly as a consequence of onchocerciasis (Ronald & Okonkwo, 2017). To these figures is added each year an estimated number of 40,000 new blind (Okafor et al., 2016). Nigeria accounts for a third of the disease global prevalence (WHO, 2013); with 7 million people infected (Okafor et al., 2016) and 50 million in 40, 000 communities at risk (FMOH, 2017). Despite the substantial level of success in the global control of the disease, there are indications that the blackfly vectors that transmit the disease still persist in many communities in Nigeria (Oluwole, Ekpo, Mafiana, Adeofun & Idowu, 2009; Mbanefo,

Eneanya, Nwaorgu, Otiji, Oguoma &, Ogolo, 2010; Noma et al., 2014; Okereke, Chike & Amadi, 2016; Okoro, Okoye, Nnamonu & Onyishi, 2016). While scholarly studies reveal significant improvement in onchocerciasis control at global level based on the success of ivermectin with some countries recording astronomical 23% prevalence decline in 2005 (Stolk, Veerman, De Vlas & Habbema, 2007) and total elimination in 2016 (WHO, 2016), it can be observed that many people especially in the rural areas are still affected by socio-economic consequences of the disease. With this in mind, the specific problem of this study becomes apparent. Onchocerciasis is significantly a disease of the poor with socio-economic implication resulting in further impoverishment of affected communities (FMOH, 2017). According to Adebayo (2014), blind victims are unable to care for their families and those with skin disease suffer symptoms that make it difficult to live a normally. Okoro et al., (2016) reveal that the disease is responsible for poor academic performance and high rate of school drop-out among children who serve as guides for their blind relatives. It also causes low productivity, low income, high health related costs, and gender differences in the stigma associated with onchocercid skin diseases (OSD) on infected adults (Aninakwah-boahene et al., 2014). Due to debilitation

and blindness, the sufferers are unable to maintain for long any type of productive activity. Since onchocerciasis is mostly among the working age (Nwoke, 2011), such permanent disability through total or serious visual impairment withdraws the affected individual's potential supply of labor years requiring vision. The true burden of onchocerciasis to a great extent has been underestimated. Although the burden of onchocerciasis is relatively small at the global level, at the community level it can be the most important health problem in endemic areas and in some situations, it may threaten the survival of the community itself (Nwoke, 2011). The economic loss due to effects of onchocerciasis can be difficult to estimate. However, at the community level, Adrian and Boakye (2011) noted that the disease is responsible for reduced productivity due to the incessant itching, leading to increased poverty, increased expenditure on health in spite of a reduced income, all of which add to the vicious cycle of poverty which this disease creates. This is apart from the effects of blindness. Onchocerciasis therefore constitutes a major public health problem and an obstacle to socio-economic development in the endemic communities. To this end, this study examines socio-economic burden of onchocerciasis in Amur community in Imo State, Nigeria.

Methods

The study design was mixed methods research. Amur is a rural community in Imo State, Nigeria. Amur was selected because it is a typical rainforest zone with rivers, vegetation and fast running streams, which serve as major breeding sites for black flies that transmit the disease to humans. The community is located in Ojibwe LGA of Imo State which is situated approximately between latitude 5° 4' and 6° 3' N and longitude 7° 10' and 7° 34' E. This area is hilly with a lot of streams and rivers draining into Imo River. The study population comprises of all male and female residence of Amur community that are 10years and above and has stayed in the community for 10years and above. This is because it is expected that all members of the communities in that age bracket know about onchocerciasis and suppose to have

started taking the preventive treatment that is distributed to only people that are aged 10years and above. The sample size of the study was 352. This was determined using the Leslie Kish (1965) formula for a single proportion, while 37% prevalence rate was adopted based on the result of a survey conducted in Ojibwe Local Government Area of Imo State on the prevalence of onchocerciasis (Okereke et al., 2016). For the qualitative data of the study, a total of 8 In-depth Interviews were conducted. It includes 1 Traditional title holders, 1 Community men leaders, 1 Community women leaders, 1 Community youth leaders, 1 Farmers, 1 Clergymen, 1 Orthodox health practitioners and 1 Traditional health practitioners. The multi stage sampling method was adopted for this study. Firstly, based on hydrological (Nwoke, 2011) and epidemiological results (Noma et al., 2014), Amur community was purposively selected due to the endemicity of onchocerciasis in the area. Secondly, purposive sampling method was used to select members of the community that are between 10 years and above. This is because it is believed that people in this category have started to take onchocerciasis preventive drugs (Ivermectin) and as such they are likely to be more knowledgeable about the study objectives. Finally, convenient random sampling method was used to administer the questionnaire to respondents that are available and willing to participate in the study. Questionnaire and in-depth interview were the data collection instruments for this study. Quantitative and qualitative methods of data analysis were used to analyses the research data. The quantitative data were processed using the Statistical Package for Social Sciences (SPSS) version 20; while the data were analyzed using descriptive and inferential statistics. For the qualitative data, content analysis method was used to analyses the interview transcript. Ethical principles of informed and voluntary consent, confidentiality, non-injury, and beneficence were fully observed throughout the data collection process.

Results

The socio-demographic characteristics of the respondents are presented in Tables 5.

Table 1: Socio-Demographic Characteristics of the Respondents

Sex	Frequency	Percentage (%)
Male	170	48.2
Female	182	51.8
Total	352	100.0

AGE		
18-29 years	98	27.7
30-41 years	86	24.5
42-53 years	72	20.5
54-65 years	57	16.3
66+	39	11.0
Total	352	100.0
EDUCATIONAL LEVEL		
None	50	14.5
Vocational	69	19.0
Primary/FSLC	74	21.1
Secondary	73	20.6
Higher/Tertiary	86	24.8
Total	352	100.0
MARITAL STATUS		
Single	104	29.5
Married	207	58.9
Divorced	9	2.5
Separated	14	3.9
Widowed	18	5.2
Total	352	100.0
OCCUPATION		
Retired	10	2.7
Student	38	10.7
Farming/Hunting	152	43.3
Trading	77	21.8
Artisan	32	9.2
Paid Employment/Salaried	43	12.3
Total	352	100.0
RELIGION		
Christianity	261	74.3
Traditional	73	20.6
Islam	18	5.1
Total	352	100.0
ANNUAL INCOME		
No Income	44	12.5
Below N300, 000	104	29.5
N300, 000- N599, 999	143	40.7
N600, 000- N899, 999	44	12.4
N900, 000- N1, 199, 999	13	3.6
N1, 200, 000 and above	5	1.3
Total	352	100.0

Table 1 show that 182 (51.8%) of the respondents are females while 170 (48.2%) are males. The table also indicates that 98 (27.7%) of the respondents are aged between 18-29 years while only 39 (11.0%) are aged 66 years and above. In terms of educational level, the table shows that 86 (24.8%) respondents have higher/tertiary education while only 50 (14.5%) of the respondents has no formal education. Table 1 also indicates that a majority of the respondents 207 (58.9%) were married while only 9 (2.5%) respondents were divorced. The table further show that majority of the study respondents 152 (43.3%) practice farming/hunting as their occupation while 10 (2.7%) respondents were retirees. In terms of

religion, the table shows that a majority of the respondents 261 (74.3%) are Christians while 18 (5.1%) representing minority of the respondents practice Islamic religion. The table also indicate that 143 (40.7%) of the respondents earn N300, 000- N599, 999 annually, while 5 (1.3%) of the respondents earn N1, 200, 000 and above annually. To understand social burden of onchocerciasis, the respondents were asked to identify how people relate with the disease infected persons. The findings are presented in table 2.

Table 2: Distribution of Respondents by how People Relate with Onchocerciasis Infected Person among Rural Dwellers in Amuru Community

Response	Frequency	Percentage (%)
They relate normally	23	6.4
Stigmatized	96	27.3
They avoid the person	174	49.4
They chase them from the community	7	2.0
They chase them from the community gatherings	46	13.1
Don't know	6	1.8
Total	352	100.0

Table 2 shows how people relate with onchocerciasis infected persons. The data indicates that more of the respondents 174 (49.4%) avoid persons infected with onchocerciasis while only 6 (1.8%) said they don't know how people relate with onchocerciasis infected persons. The data further indicates that stigmatization is also a major socioeconomic burden faced by onchocerciasis infected persons in Amur community. This was supported by findings in the IDI data which shows that avoiding and isolation are major burdens faced by those infected by the disease. One of the IDI respondents described this in these words. What the

disease hinders infected person is that he/she cannot stay where other people are. They will be avoiding him/her. Even if he/she comes to where you are sitting, you will shift because we believe that maybe the itching can be infectious. It is why we avoid the person. [Male, Retired Civil Servant, Aged 73]. This shows that people tend to avoid persons infected with onchocerciasis. To understand reasons people, tend to avoid persons infected with onchocerciasis, the respondents were asked to identify why people avoid the disease infected persons. The findings are presented in table 3.

Table 3: Distribution of Respondents by Reasons People Avoid Onchocerciasis Infected Persons in Amuru Community

Response	Frequency	Percentage (%)
Considered infectious	189	53.8
Look ugly	29	8.3
Irritating	21	6.1
Unclean	48	13.5
Scary	44	12.4
Embarrassing	21	5.9
Total	352	100.0

Table 3 shows that a majority of the respondents 189 (53.8%) said they avoid onchocerciasis infected persons because the disease is considered infectious while only 21 (5.9%) said they avoid the disease infected persons because they look embarrassing. This suggests that fear not to be infected with onchocerciasis make people in Amuru community to avoid the disease infected persons.

This fear was also expressed by a respondent in the IDI data

People avoid infected persons especially those ones that have skin itching. The person will not be comfortable staying beside infected person because he/she may think the disease will infect him/her. They will avoid infected person because they don't understand what that is wrong with such person and don't know if it is infectious. In fact, the main reason

is fear not to be infected. [Male, Herbalist, Aged 62]. The comment made by another respondent indicates that isolation of the sick may be common in Nigeria. She said: "You know in this our country, when someone is sick there is always this tendency of isolation and you know this one is blindness it is only a close relation that may want to stay the person close" [Female, Farmer, Aged 61]. The tendency to isolate and stigmatize those suffering from onchocerciasis may be related to their associating the disease with other dreaded diseases like HIV/AIDS.

This is shown in the comment made by one of the respondents who stated that

Sometimes people think that affected people have been infected by disease such as HIV or that the sickness was sent by someone spiritually, so when you see someone that is suffering from such disease you

avoid the person before he infects you with the disease [Female, Farmer, Aged 73]. People's attitude of isolating those suffering from onchocerciasis was associated with local dweller's awareness of the disease.

For instance, a respondent who identified himself as a politician said

"In fact, people start thinking that they [victims of onchocerciasis] have the disease that can't be cured

and people start alienating themselves from them and keep distance and this is because of the poor awareness level of the disease in the community [Male, Politician/trader, Aged 57]. The respondents were further asked to identify major socioeconomic burden faced by onchocerciasis infected persons in their community. The findings are presented in table 4.

Table 4: Distributions of Respondents by Major Socioeconomic Burdens Faced by Onchocerciasis Infected Persons in Amuru Community

Response	Frequency	Percentage (%)
Peer isolation	85	24.1
Poor school attendance	73	20.8
Reduced productivity	70	19.9
Stigmatization	86	24.3
Poverty	12	3.5
Discrimination in community gathering	13	3.6
Low self esteem	13	3.6
Total	969	100.0

Table 4 shows that more of the respondents said peer isolation (86, 24.3%), stigmatization (85, 24.1%), poor school attendance (73, 20.8%) and reduced productivity (70, 19.9%) are major socioeconomic burdens faced by onchocerciasis infected persons while only 12 (3.5%) respondents said it is poverty. This was corroborated in the IDI data. The findings show that reduced productivity, poor school attendance and peer isolation are major socioeconomic burden faced by onchocerciasis infected persons. As presented by one of the respondents: "You know when one is itching, he can't go to work, he can't produce food and he can't make money to get food. So, I think that is one of the major socioeconomic burdens" [Male, Medical Doctor, Aged 35]. Apart from the burden of caring for self, the disease affects the capacity of the breadwinners suffering from the disease to provide for his/her family.

One of the respondents puts it this way

If you are sick you cannot provide for your family especially in a rural community like our own where maybe if the bread winner is affected, how he will feed his children so obviously it will have significant economic effect [Male, Clergy, Aged 37]. Another

perceived major burden of onchocerciasis is poor academic engagement and isolation among those pursuing academic programs in schools.

This was identified by some of the respondents

Just like any other illness, if school children are visually impaired or their vision is not as good as it used to be, obviously they cannot be attentive in class; they cannot see the black board. If they have fever, that will also affect their attention in the classroom and even reading at home. If it is skin itching other students may not want to closely associate with the person and the teacher may even sent the student home to go and get treatment and thereby making the student to miss classes. [Male, Clergy, aged 37] Similar view was shared by another respondent that said: "Children that are going to school.....it makes them sometimes not do well academically because of this impaired vision. So, imagine someone that does not see well.... he cannot see the board" [Female, Student, Aged 27]. Table 5 presents logistic regression analysis of the effects of respondents' awareness of socioeconomic burden of onchocerciasis and willingness to participate in the disease prevention and control programs.

Table 5: Logistic Regression Predicting Awareness of Socio-economic Burdens of Onchocerciasis on Participation in the Prevention and Control Programs

Variables in the Equation

	B	S.E.	Wald	Do	Sig.	Exp(B)
Onchocerciasis and medical spending	-.366	.119	9.484	1	.002	.693
Severe skin itching and farmer's loss of man hour	.334	.130	6.582	1	.010	1.397
Visual impairment can cause one to be unemployable	-.337	.115	8.557	1	.003	.714
Academic performance of children with severe itching and sight impairment can be negatively affected	.178	.081	4.870	1	.027	1.195
Onchocerciasis and poverty	-.375	.085	19.651	1	.000	.687
Onchocerciasis and students poor academic result	-.331	.104	10.201	1	.001	.718
Onchocerciasis and reduction of social esteem	-.275	.109	6.393	1	.011	.760
Nodules on the face of a trader can reduce sales volume	.171	.074	5.378	1	.020	1.186
Constant	.588	.479	1.508	1	.219	1.801

Table 5 shows value of the logistic regression analysis indicates that all factors tested were statistically significant at ($p < 0.05$). This means that all the tested independent variables predict (i.e., are likely to have) significant effect on individual decision to participate in onchocerciasis prevention and control programs.

Discussion

This study analyzed the socioeconomic burden of onchocerciasis in Amur community in Imo State, Nigeria. It was found that over half of the respondents avoid people infected with onchocerciasis. The major reason given was because they believe that onchocerciasis is infectious. This is in line with result of data from the qualitative component of the study and is supported by the findings of a study conducted by Okafor, Uzoka, Ajunwa, Chikezie, Iyam and Dalla (2016) in Enugu East and Nkana West Local Government Areas in Enugu State. The authors found that 71.2% of the respondents would not be comfortable having physical contact with afflicted people because of the feeling that the disease is infectious (Okafor, et.al. 2016). Also, it was found that peer isolation, poverty, poor school attendance and reduced productivity where major socio-economic burdens onchocerciasis infected persons suffer in the community. This is in line with a study conducted by Ikpeze et al. (2014) in Aching, Adani and Euouae communities in Enugu State, Nigeria which found absence from social gathering, loss of income, poverty, child absenteeism from school, low self-esteem as major socio-economic burdens faced by onchocerciasis infected persons. However, in the IDI data, it was found that "avoidance and stigmatization", which are generally seen as negative behaviors can positively affect onchocerciasis control in rural areas. This is because in other not to face social burden of avoidance and stigmatization, people adopt preventive behaviors by participate in the

disease preventive and control programs. Those that are already infected also seek ways to cure the disease to stop people from avoiding or stigmatizing them. Other major socioeconomic burdens that affect onchocerciasis infected persons include "low productivity and loss of income" and "poor academic engagement and achievement".

Using Logistic Regression analysis, it was found that awareness of the consequences of socio-economic burdens of onchocerciasis such as medical spending, man hour loss, unemployment, academic performance, poverty, social esteem and reduce sales volume affect the decision of people to participate in the disease prevention and control programs. This is because due to their awareness of onchocerciasis negative consequences and desire not to be infected, people participate in the disease preventive and control programs to collect the disease preventive and treatment drugs.

Conclusion

Majority of the people in Amur community avoid onchocerciasis infected persons because they believe that it may be infectious. Onchocerciasis infected person's suffer many social, economic and psychological burdens in Amur community. The burdens include peer isolation, poverty, poor school attendance, reduced productivity, medical spending, man hour loss, unemployment, reduced social esteem and stigmatization. However, awareness of the consequences of onchocerciasis socio-economic burdens motivates people to participate in the disease prevention and control programs in Amur community.

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