Schistosomiasis an Issue in Flood Prone Area of DambakurimaWard 1, Muzarabani District of Zimbabwe

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Abstract: *The study focused on community, perception of schistosomiasis during floods. Random sampling was used to select the respondents. A Sample of 100 household was chosen to respond to questionnaires and a focus group interview of the community members was done. The study embraced the entire Dambakurima Ward 1 and its nearest health Centre. Questionnaires, field observation and interview were used, as data collection instruments. The study established that schistosomasis is the most prevalent diseases during floods and other factors like religious beliefs contributed to the spread and effects of the diseases in Dambakurima Ward, as people have high frequent contact with polluted water bodies that harbor the parasites. The study also established that the community were aware of the high prevalence of schistosomiasis problems in the area, but lacked the knowledge on how to control it. Hence in their ignorance, present themselves again to multiple infections after successful treatment.Focus group discussions revealed that 80% of the respondents linked the high prevalent of schistosomiasis to climate change and there was evidence of uncoordinated approach among the various stakeholders, who try to help these community to reduce parasitism density among the population. Though there is a nearby clinic, access to information and education has been a challenge because of religious reasons. The study recommends total involvement of all stakeholders in the control of the disease. Mass screening of the group should be done followed by treatment. Well structured awareness campaigns should be done before the onset of rain season. The study recommends environmental education which focus on climate change, disease control and understanding of indigenous knowledge discourse like the use of phytolacca dodecandra which is a plant that grows naturally.*

Keywords: climate change, floods, perception, schistosomasis, vulnerable.

1. Introduction

[3] says the risk of climate sensitive diseases and health impacts can be high in poor countries. In Zimbabwe cases of schistosomiasis have been recorded to be high during flood periods as in the case of Dambakurima Ward 1 in Muzarabani District of Zimbabwe. Little capacity to prevent and treat the schistosomiasis disease has been outlined as the reason behind.

It is believed 85 % of schistosomiasis world cases are found in Africa, and in some cases the local population prevalence rates surpass 50% [7]. schistosomiasis is one of the diseases associated with the effect of climate change in Zimbabwe. In the semi arid region of Zimbabwe like the Dande Valley, schistosomiasis is the second to malaria in causing morbidity [6]. Very little or no research has been conducted in the study area, to investigate the community's perception on schistosomiasis believed to be attributed to climate change. Efforts have been made by the Health and Central Statistics department to describe the epidemiology, transmission and clinical trials of antischomes and control efforts. The general public's perception on this health issue has been ignored. Availability of this information will thrive to address problems of implementation of health programmes related to health. In an attempt to cover gap this paper will explore the community of Dande's perception on floods related health problems.

Studies were conducted in Uganda pre-schools; school going age, on the prevalence of schistosomiasis [7] in his study

mentioned that, those who were treated of schistosomiasis were reinfected without delay for various reasons. In the study area Dambakurima, the flood prone area of Mashonaland Central in Zimbabwe, reports of children who were passing blood stained urine was made by parents and school authorities. This study's main thrust was to establish causes of reinfection, soon after successful treatment of those infected and the factors that led to high prevalence rate of the schistosomiasis disease in that area.

2. Problem Statement

Despite government's efforts in Dambakurima ward on the provision of health facilities, health staff and medication, there is high prevalence of schistosomiasis A cause for concern is the high reinfection rate of those who were successfully treated in the parasitological studies phase. It is important to establish factors leading to high prevalence, reinfection and suggestion of ways that can effectively control schistosomiasis in Dambakurima ward 1 of Muzarabani District.

3. Main Objectives

The main focus of the study was to establish factors that have led to quick reinfection of treated cases of schistosomiasis and establish the community perception and ways of controlling the disease in Dambakurima ward.

Specific Objectives:

- To identify environmental conditions which promote to the spread of schistosomiasis?
- To determine the cause of high prevalence and reinfection of the disease in the study area.
- To suggest possible control options that could reduce the prevalence of the disease in the area.

4. The Study Area

The study was undertaken in the Dande Valley in ward one Muzarabani District of Mashonaland Province in Zimbabwe. According to the Zimbabwe National Census report of 2012 the ward had a total population of 7032. Environmental migration has caused the study area to have diverse culture mainly dominated by the Chikore-kore culture composed of the original inhabitants and Chivhitori mostly environmental migrants from Masvingo province another arid region of Zimbabwe. The study area shown in Figure 1 includes Musengezi River, its tributaries and the lower portion of Caborra Bassa dam, which contribute to various diseases including schistomasis.

Ward 1 of Muzarabani district is found in the northern, semi-arid region of Zimbabwe .The study area experiences low unreliable erratic rainfall averaging 450mm, and average high atmospheric temperature of $+38^{o}C$. The area experiences recurrent floods. Inundation of the flood plain in Dambakurima is asynchronous to the rains; hence the extent of inundation is not uniform, [9] The main rivers are Musengezi, Nzoumvunda, Musingwa, and Hoya. The mentioned rivers provide suitable breeding for schistomiasis parasites. In the study area, the main rivers like Nzoumvunda provide water for both animals and human beings. Women and children are in constant contacts with the rivers, as they cross the rivers visiting schools, clinics or their fields.
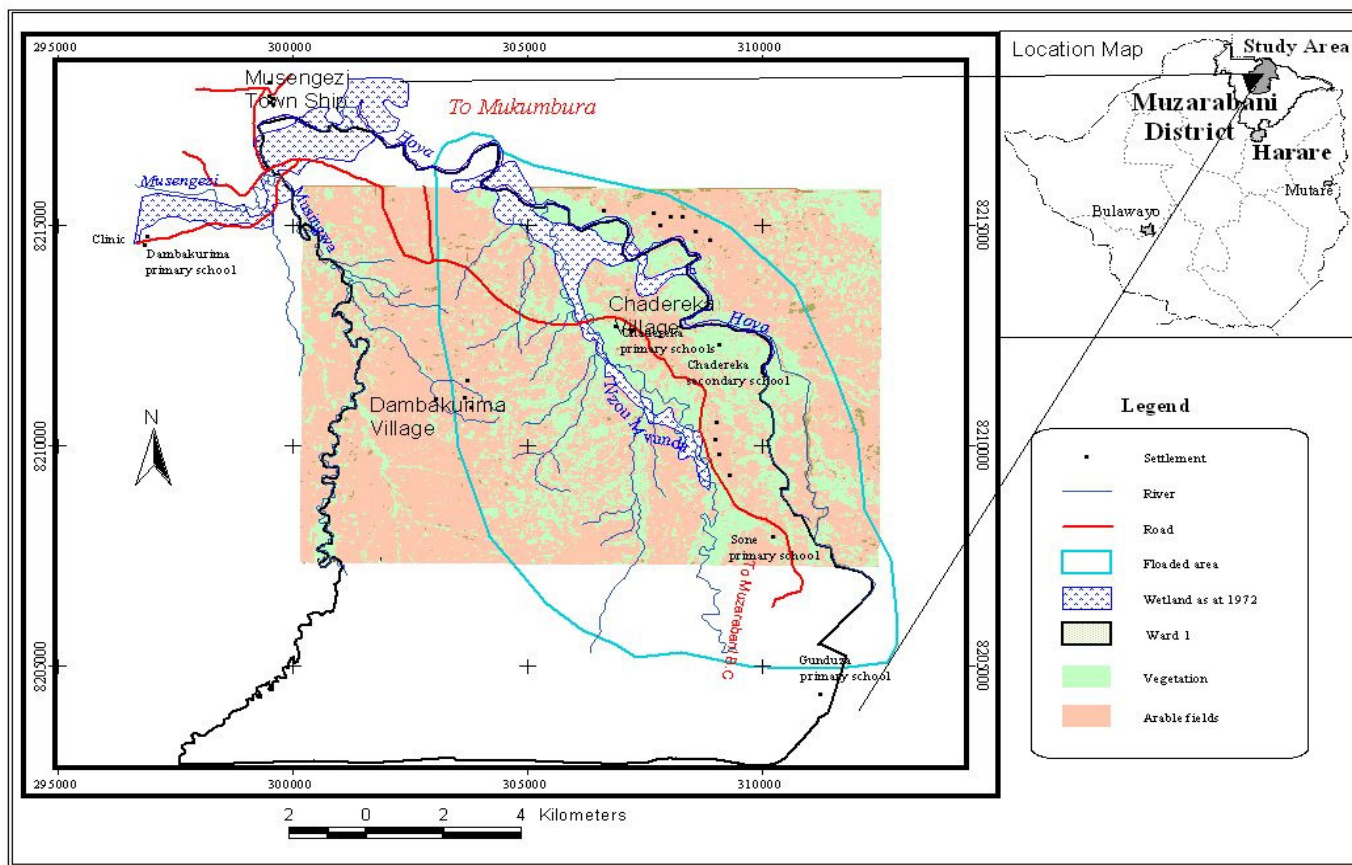

Figure 1: The Flood Prone area and main rivers of Dambakurima Ward 1 in Muzarabani District of Zimbabwe.

5. Methodology

The study was a non interventional analytical, endowed by cross sectional survey of household which cover ground in a short given time. Descriptive surveys make use of qualitative data and quantitative, hence it was used in this study to explore community perception on schistosomiasis prevalence and control. The participatory rural appraisal approach (PRA) was used to garner perception information and awareness of schistosomiasis in flood prone area.

In addition the study made use of desk tops searches. Interview of key informants experts and focus group discussion, secondary data was sourced through desktop searches. Face to face discussions were also used to solicit information from experts and flood prone area residents. 440 participants were randomly selected. The sample consisted 360 children (150 males and 210 females) aged between ten and sixteen and 80 community members (age 18-65), 35 males and 45 females who included councilor, agritex official, headmasters, health personnel and villages heads. Adults participated in a focal group discussion while children responded to a questionnaire which solicited their

knowledge, attitude and needs on schistosomiasis. The following are some of the questions that were asked to the children:

- How many members of the family have suffered from schistosomiasis for the past 5 years?
- What are the main causes of schistosomiasis in your area?
- How severe is the problem ,extremely severe/ moderately severe/ weak
- How do you cope with the outbreak of schistosomiasis?

6. Method of data analysis

Data was analysed using the Statistical Package for Social Scientist (SPSS), Ordinary Least Squares (OLS)/quantile regressions and the principal component factor analysis was used. Data was provided as mentioned by participants in their focus group discussions and responses to the questionnaire. The socio-economic data results were drawn from descriptive statistics such as percentage distribution, frequencies and cross tabulation. The main thrust of quantlie regression in collaboration with OLS was to ensure the dependence of the rate of change of conditional quantile of the response variable versus the quantile says [1], [4].

7. Limitation of the study

- Lack of instruments like the microscope to test samples from respondents was one set back which led the researchers to rely on information from the ministry of health in Zimbabwe through its Blair research institute.
- The time limit was one of those factors which were a cause of concern to the researchers.
- Some of the respondents, place of residence were not easily accessible hence researchers resorted to the use of motor cycles
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8. Results and Discussion

The sample used in the study constituted 440 participants, 360 children (150 males and 210 females) and 80 community members, 35 males and 45 females, 44% dejure of families which are female headed 16% defacto of households which are headed by females. In a common extended structure in the study area, a family had 6 people as mean. Households that had no formal education added up to 58%. For those that were headed by males 36%, where as defacto and dejure male headed had 4%.

The results revealed that out of the 360 respondents in the Dambakurima area, 80% indicated the knowledge of the prevalence of schistosomiasis n the area. 15% of the respondent said they were not sure of the prevalence of the disease. 5% indicated total ignorance of the existence of the disease. The results are consistent with the Intergovernmental Panel on Climate Change [3] report, [9] and [5] which suggests that, more poor people will be exposed to the effect of climate change. The respondents indicated that besides the high prevalence of schistosomiasis, what was most worrying was the recurring of the disease even after intervention by various institutions. It is therefore proof enough that prevalence of diseases especially in flood prone areas and the entire study area has

been experiencing seasonal variations which resulted in alternate extreme weather conditions of drought and floods. The unpredictable climate variability in Dambakurima area means many people are exposed to quite a number of water borne diseases [2].
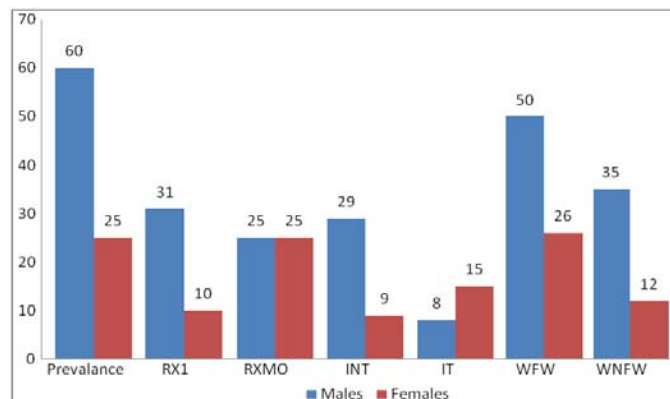

Figure 2: Data from children between 10- 16 years. Gender versus prevalence, treatment status and practice of 360 children

KEY
M: Male
F: Female
RX1: Treated Once
RXMO: Treated More Than Once
INT: Infected Not Treated
IT: Infected Treated

WFW: With Foot Wear
WNFW: Without Foot Wear

The findings revealed that there was high percentage 60 % of boy's interms of prevalence of schistosomiasis than girls 25% within the 10 to 16 years of age group. The results means boys were more exposed to water schistosomiasis than their female counter parts. This could be attributed to the fact that boys in most rural settings play in contaminated rivers and streams while herding and watering cattle, they also practice fishing and swim in rivers as their recreation, thus exposing themselves to schistosomiasis and other water borne diseases more than the girls.

From the focal group discussion, it was also revealed that men are at risk of being infected by schistosomiasis as they go out fishing while fending relish or food for their families. The study noted that, because of the patriarchal system practiced in Dambakurima area, girls are more confined to their home, reducing their chances of contacting water borne diseases. Worse still, girls in this community crave for their privacy so they don`t bath in rivers as the boys do. Reinfection was noticed to be taking as records from the nearby clinic showed that there was an interval of 3 to 4 visits a year indicating high prevalence of the diseases, in the most stagnant water bodies found in Musingwa, Chadereka and Nzoumvunda rivers, for the rest of the year. Most of the respondents indicated that they were able to diagnose the disease through the blood stains they notice in urine as also highlighted by [5].

8.1 Vulnerability of respondents to schistosomiasis

This study refers vulnerability in the context of exposure to the schistosomiasis disease. [8] Ascertains that poverty exposes many people in semi-arid regions to the effect of climate change. In assessing the vulnerability of the people to schistosomiasis the researchers used the Ordinary Least Square (OLS) and quantile regression analysis.

Table 1 reflects that two of the five explanatory variables were statistically significant for the OLS case and the two were namely gender and religion however education was also significant in its 75th quantile.Results showed that (1 if male and 0 if female) was negative and statistically significant ($p<0.01$) married or related with the religion of the respondent, as was in each of the quantile regression. Gender`s negative effect in the study suggest that male were more vulnerable to schistosomiasis than their female counter parts. The results are in contrast with previous studies, [3] which says that women are more vulnerable to climate change than men. The quantile regression from this study showed that man`s exposure to stagnant water, through fishing or bathing showed a decline from the $25^{th}$ through the $50^{th}$ and eventually the smallest for the $75^{th}$ quantile. Men`s vulnerability to s schistosomiasis, according to this study is mainly because of poverty, which deprives them from enhanced practice/ coping and adapting strategies. High dependence on natural resources like fish makes the community vulnerable to schistosomiasis as they at times use nets to harvest. As mentioned by [2], limited options in terms of source of income, recreation and religion were also mentioned as a cause of vulnerability. In addition, inadequate information, remoteness of the study area lack of health facilities, drugs, health manpower and inclusion of villagers in health policies formalization worsens their situation.

Table 1: OLS and Quantile regression results on factors influencing the Dambakurima Ward community/subjects, s level of proness to Schistosomiasis as a climate change shock

<s/no	Variables	Linear regression	Quantile 25th	Regression 50th	75th
I	Gender of respondent (male, female)	86,961.87 (-3.27)****	109.009.1 (-8`11)	66.256.72 (-8`72)***	66.256.72 (-3.92)
II	Age	-1.66398 (-1.10)	-45.321 (-0.06)	-591.56 (-0.91)	1.972.422 (-2.17)
III	No. of years in your religion	1.942.728 (1.42)	82.312 (-0.10)	1.147.52 (-1.72)	1.521.444 (1.73)
IV	Level of education	2.532.011 (1.09)	1961.23 (-0.72)	789.28 (-0.72)	3.976.026 (2.53)
V	Do you put on shoes	16.001.69 (0.90)	5.978.590 (-0.69)	10.892.39 (1.26)	

Significant at; *10,**5,***1

Level of education shown by the study was not significant in the OLS neither in the range of 25th and 50th quantile [4] . However it was significant when related to a variable in the 75th quantile as suggested by [1].

Prevalence of disease in relation to religion. The findings revealed that the Johanne Masowe was the most dominant religious sect in ward 1 of Dambakurima in Muzarabani as shown in Figure 3
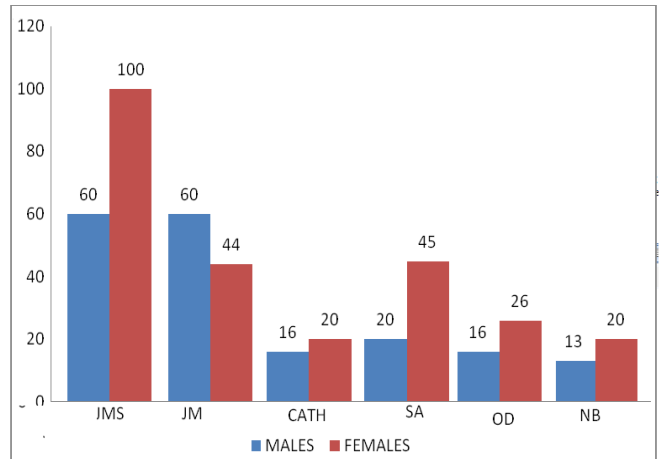

Figure 3: Prevalence of the schistosomiasis disease in relation to religion

KEY:
JMS: Johanne Masowe
JM: Johanne Marange
CATH: Catholics
SA: Salvation Army
OD: Other Denominations
NB: Non-Believers

The people's religious orientation and behavior were contributing to the spread of schistosomiasis as an example the Johanne Masowe. The affore mentioned group conduct baptism of their followers more than 6 times a year during the summer, which is the period when most water borne diseases is spread. However the members of the identified religious groups argued, that water used to baptize people was holy so could not affect people. This contrast is a wrong perception, since scientifically the contacts with water from the infected rivers make successful infection during baptism, hence high prevalence rate in religious circles. Group discussion exposed some churches who conduct their churches, outside the village in bushes outside the village, in proximity to water source due to numbers involved some end up bathing and drinking water from Nzuomvunda or Musingwa rivers thereby exposing themselves as infection and re-infection .This increases the chances of high prevalence of the diseases in the area.

8.2 Preventative Measures

The study established that many respondents had blair toilets, which are at different stages of construction .However some are not functional hence they use the bush systems. It was also observed that most of these people are farmers who spent most of their time in the fields and gardens were there are no toilets, amid most of the flood plains; this means rivers and streams are easily contaminated by human waste. The schistosomiasis programme did not provide all households with a blair toilet; however the community did not take the idea but instead blame the authorities for empty promises.

9. Conclusion

The study`s respondents understanding of the schistosomiasis is relatively high and indeed associate it with climate change. Though they had the knowledge, they

were exposing themselves to infection. Various factors contributed to their vulnerability to the disease and these included poverty, religion, and lack of resources. Men are more exposed to the schistosomiasis diseases than women in the study area. The study recommends that members of the community should engage responsible health officers and other stakeholders map strategies that would help them combat the disease. Government officials should also support these poor farmers, and encourage them to adopt preventative measures .The government should train, provide awareness campaigns to all members of the community irrespective of age, sex race or creed.

Reference

[1] Härdle, W. (2003): Applied Multivariate Statistical Analysis. Springer Verlag, Heidelberg. Hyndman, R. J., and Y. Fan (1996): "Sample Quantiles in Statistical Packages," The American Statistician, 50(4), 361 – 365.

[2] FAO. (2007). *Report of the 33rd session of the Committee on Food Security* (Rome 7–10 May 2006). Rome.

[3] Fenwick A, Rollinson D, Southgate V, 2006. Implementation of human schistosomiasis control: challenges and prospects.Adv Parasitol 61:

[4] Intergovernmental Panel on Climate Change (IPCC). 2007. Fourth assessment report: Climate change 2007. Cambridge, United Kingdom: Cambridge University Press. http://www.ipcc.ch/ publications_and_data /publications_and_data _reports.shtml.

[5] Lee, S. (2005): "Lecture Notes for MECT1 Quantile Regression," available at http://www.homepages.ucl.ac.uk/~uctplso/Teaching/MECT/lecture8.pdf

[6] Martens WJM, Jetten TH, Rotmans J, Niessen LW, (1995). Climate change and vector-borne diseases: a global modeling perspective. Glob Environ Change 5

[7] Mazigo, H. D., Waihenya, R., Lwambo, N. J., et al (2010) Co-infections with Plasmodium falciparum, Schistosoma mansoni and intestinal helminths among schoolchildren in endemic areas of northwestern Tanzania. Parasites & vectors, 3 (44). pp. 1-7. ISSN 1756-3305.

[8] Morgan OW, Brunette G, Kapella BK, McAuliffe I, Katongole-Mbidde E, Li W, (2010). Schistosomiasis among recreational users of Upper Nile River, Uganda, 2007. Emerg Infect Dis; 16(5): 866–8.

[9] World Health Organization: Prevention and Control of Schistosomiasis and Soil-Transmitted Helminthiasis. In *Report of a WHO Expert Committee. WHO Technical Report Series No. 912*. WHO, Geneva; 2002.

[10] Qin DH, 2004.Climate Change: Science, Impact and Countermeasure. Beijing: China Meteorological Press.26. Mao CP, 1990.

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