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Evaluating Neglected Tropical Diseases (NTDs) with ICT

Odesanya, Akeem Dele
Department of Computer Science, Federal Polytechnic, Bali. Nigeria

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ABSTRACT

The contemporary importance of Information and Communication Technologies (ICT) globally has made it to become an indispensable tool in healthcare industry. The neglected tropical diseases (NTDs) are infectious diseases that are found mainly among the world's poorest people. They are found in several countries in Africa, Asia, and Latin America. NTDs are especially common in tropical areas where people do not have access to clean water or safe ways to dispose of human waste. This research works utilized ICT for the evaluation of the state of NTDs in Taraba state, Nigeria using SPSS version 27. The primary data were collected from Specialist Hospital, Jalingo and Primary healthcare centres across local governments in Taraba State Nigeria. The proffered recommendations will however assist in eradicating or reducing the disease in Taraba state

Keywords: Evaluation, Eradicating, Neglected tropical diseases (NTDs), ICT

INTRODUCTION

Information and Communication Technologies (ICT) are becoming indispensable nowadays for the healthcare industry. Information and community technologies (ICT) have become key tools and had a revolution impact on how we see the world and how we live. Today, the place of ICTs in education and the world in general cannot be undermined.

Modern day businesses are conducted and facilitated through the use of telephones, fax machines and computer communication networks through the internet. This phenomenon has given birth to the contemporary e-commerce, e-government, e-medicine, e-banking and e-education among others. [1], [2].defines ICT as the handling and processing of information (texts, images, graphs, instruction, etc.) for use, by means of electronic and communication devices such as computers, cameras, telephone. [3] and [4] also refer to ICT as electronic or computerized devices, assisted by human and interactive materials that can be used for a wild range of teaching and learning as well as for personal use. From these definitions' ICT could therefore be defined as processing and sharing of information using all kinds of electronic device. [5]. Information and Communication Technology (ICT) drives the modern world in education, sports, engineering, management, health, tourism, economics, and communication. All have connections, either because ICT is used as a tool or because ICT is the way to solve problems [6]. Information and communication technology (ICT) have become an essential component of school education. Students' self-efficacy in using ICT has been shown to contribute to their ICT literacy. However, research on the correlates of ICT self-efficacy has been insufficient, resulting in often oversimplified causal statements. This study investigated the relationship between adolescents' interest in ICT and their ICT self-efficacy at age fifteen based on data from 30 Organization for Economic Co-operation and Development (OECD) countries that participated in the Programme for International Student Assessment (PISA) 2015 [7]. In Nigeria, schistosomiasis is a serious and increasingly serious disease due to lack of drinking water and activities related to water resources development projects for irrigation, fisheries and hydropower. Overall, the disease mainly affects the rural poor and vulnerable age groups. Students are the main victims of this disease. Schistosomiasis can cause diseases such as bladder cancer, anemia, liver dysfunction, etc. Nigeria is the country most affected by this disease in Africa. In 2006, about 116 million of the estimated 555 million

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Africans were at risk of the disease [8]. Schistosomiasis is the most studied neglected tropical disease (NTD) in Nigeria. In [9],[10] Schistosomiasis transmission has been reported in 78 countries worldwide, it affects nearly 240 million people worldwide and more than 700 million people live in endemic areas [11]. Schistosoma haematobium is endemic to sub-Saharan Africa, the Middle East and some islands in the Indian Ocean. In 2012, 779 million people worldwide were at risk of schistosomiasis [12], [13]. It is more common in sub-Saharan Africa, where more than 90% of infected people live. About 62% of all cases live in 10 African countries (Nigeria, Ethiopia, Congo, Kenya, Tanzania, Cameroon, Uganda, Malawi, Ghana and Mozambique [8];[14]. Nigeria is the country that bears the brunt severity of the disease In Africa, about 116 million of the estimated 555 million Africans were at risk of the disease in 2006. Despite a national program, schistosomiasis has not been the subject of major efforts. widespread control on a large scale in Nigeria. The Carter Center (TCC) is the only NGDO conducting integrated control of schistosomiasis and other NTDs in the Plateau, Nasarawa and Delta states. The national program received its first donation of 3,366,000 Paraziquantel tablets from Mereck, Germany to Ekiti, Edo and Ondo states through WHO in July 2009.

The first problem that causes schistosomiasis to continue to spread in Nigeria is poverty. Schistosomiasis affects almost every population, especially in children and adults who practice unprotected irrigated agriculture or lack drinking water [14]; [15] . Severe schistosomiasis disrupts schooling, contributes to malnutrition, and impairs children's cognitive development [8]. These diseases harm a family's economic potential because they weaken children's health [16], [17],[18].

Schistosomiasis transmission is most likely linked to lack of water, sanitation and hygiene [19], [20]. Schistosomiasis transmission is often seasonal, mainly due to changes in temperature and irrigation cycles. approximately 43 million Nigerians require treatment for schistosomiasis [15], [21].

Five species of trematode parasites belonging to the Schistosomiasis family infect humans [22]. They have a complex life cycle, in which dredgers are intermediate hosts.

In Nigeria, schistosomiasis, a variant of NTD, is a disease of significant and increasing importance due to lack of drinking water and activities related to water resources development projects for irrigation, fishing and hydroelectricity. Overall, the disease mainly affects the rural poor and vulnerable age groups. Students are the main victims of this disease. Schistosomiasis can cause diseases such as bladder cancer, anemia, liver dysfunction, etc. [15]. Nigeria is the country most severely affected by this disease in Africa. In 2006, about 116 million of the estimated 555 million Africans were at risk of the disease [15],[20]. Rural communities in Taraba State, Nigeria (Figure 1), are endemic for urinary schistosomiasis. Low educational attainment appears to be a risk factor for urinary schistosomiasis in Nigeria (e.g. Taraba state), as although there are public taps providing domestic water in the study area, about > 30% of villagers still have running water. their local river water [23], leading to greater exposure/transmission of schistosomiasis.

Reported problems

Taraba State (Figure1) is bordered by Nasarawa and Benue States to the west, Plateau State to the northwest, Bauchi and Gombe States to the north, Adamawa State to the northeast, and Cameroon to the east and south. Taraba is located primarily in central Nigeria and consists of a hilly landscape with some mountainous features. This includes the picturesque and important Mambila Plateau. The state lies mostly in the tropical zone and is covered by low forests in the southern part and grasslands in the northern part. The Mambila Plateau, at an altitude of 1,800 meters, has a temperate climate all year round. The Benue, the Donga, the Taraba and the Ibi are the main rivers of the state. They rise from the mountains of Cameroon and run almost the entire length of the state in the north and south to flow into the Niger. The state of Taraba is located in the northeast of the country and was separated from the now dissolved state of Gongola in 1991. It lies approximately between latitudes 6º30′ and 9º36′ north and longitudes 9º10′ and 11º50′ east. The states bordering the state are Adamawa, Gombe, Plateau, Nasarawa and Benue states. Along its eastern border,

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the State shares the boundary with the Republic of Cameroon. It has a land mass of about 51,000 km^2 and a projected estimated population of about 2.7 million (NPC 2006). But the state is found endemic for Oncho, LF, Schisto, STH and Trachoma [24].

Research of this nature has become urgent due to the schistosomiasis situation in Taraba state. Various measures have been taken to control, prevent and eliminate schistosomiasis in Nigeria. But none of addressed the issue of NTDs, hence the use of ICT for the evaluation of NTDs becomes imperative. The objective of this study is to use ICT to evaluate Neglected Tropical Diseases (NTDs).

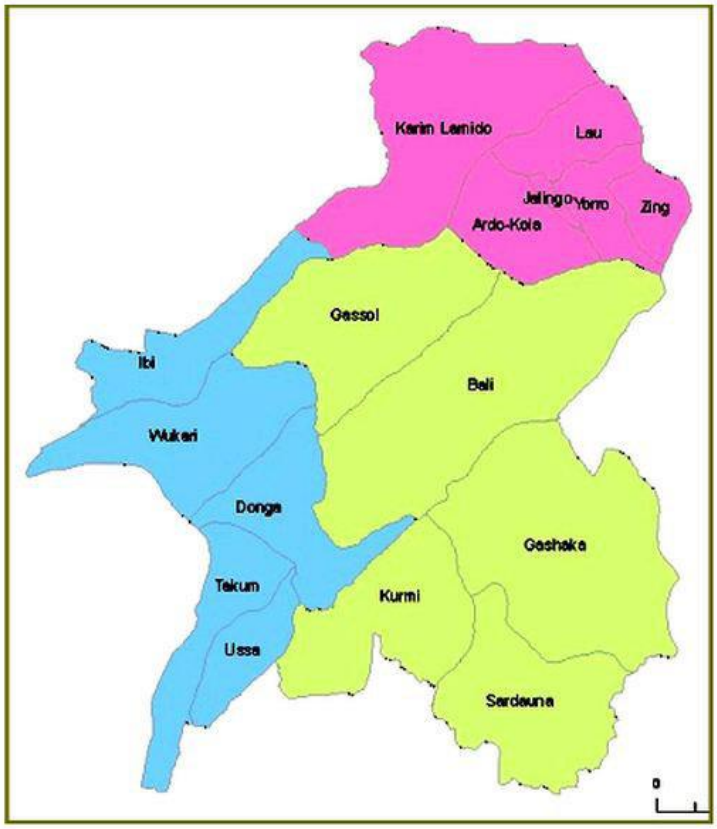

Fig. 1 Map of Taraba State, Nigeria

RELATED WORKS

NTD is a chronic disease with clinical characteristics similar to many non-communicable diseases [25], [26]. Many NTDs and their associated interventions and policies need further evaluation [27].

NTDs are an important public health problem that can be prevented through folic acid supplementation and fortification of essential foods [20], [28].

As presented in [29]. It is clear that productivity is affected by NTDs, although the actual impact depends on the type and severity of the NTD and the context in which it occurs. About the best way to control and eliminate NTDs:

[30] estimate that the data set identifies integrated management of NTDs that should be cost-effective to increase treatment coverage.

[31] expressed the need to increase the priority of systematic reviews of NTDs, especially assessments of the accuracy of diagnostic tests. However, [32] stated that neglected tropical diseases (NTDs) have chronic, insidious clinical manifestations and cause severe chronic disease syndromes similar to chronic non-

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communicable diseases. infections (CNCD), such as Chagas disease, urinary schistosomiasis, and trichotillomania.

Schistosomiasis is a poverty-related health problem that affects more than 200 million people, and while significant progress has been made in understanding the disease, it is important to strengthen capacity research in countries.). It should be noted that schistosomiasis remains a neglected public health problem with high mortality in endemic and emerging areas [33].

Studies by [34] have presented epidemiological factors that influence environmental and social conditions on the occurrence of schistosomiasis.

ICT policy thresholds for reducing CO2 emissions are established and discussed [35]. The paper assesses how increasing ICT affects CO2 emissions. The scope is on forty-four countries in sub-Saharan Africa for the period 2000–2012. The empirical evidence is based the Generalised Method of Moments. [36] discusses the new BP monitoring system utilizes our recently developed biological and environmental signal monitoring Information Communication Technology/Internet of Things system, which can simultaneously monitor the environment (temperature, illumination, etc.) of different rooms in a house (entryway, bedroom, living room, bathing room, and toilet), and a wrist-type high-sensitivity actigraph for identifying the location of patients.

In [37], utilization of ICT in healthcare services for accelerating a faster commencement of the COVID-19 outbreak was presented. The study aims to perform a scientometric analysis of scholarly literature on airborne diseases in the discipline of science and technology. It explores the recent advancement of internet technologies in healthcare to control the prevalence of deadly airborne illnesses by applying analytical approaches. It presents publication trends, citation structure, influential sources, co-citation, and co-occurrence network analysis using the CiteSpace tool.

A systematic review of the clinical effectiveness of interventions using information and communication technologies (ICTs) for managing and controlling chronic diseases. Electronic databases were searched for randomized clinical trials that assessed the effectiveness of ICTs (except for those that included only telephone communication) and measured some clinical indicator was presented in [38].

A theoretical framework for the socio-economic impacts of ICT was built by [39]. The model described the socio-economic impacts of ICT on citizens is developed. The study uses the interpretive approach and the narrative research method.

The need to demonstrate the technical feasibility and medical effectiveness of personalised services and care programmes for Parkinson's disease, based on the combination of mHealth applications, cooperative ICTs, cloud technologies and wearable integrated devices, which empower patients to manage their health and disease in cooperation with their formal and informal caregivers, and with professional medical staff across different care settings, such as hospital and home was presented in [40]

Information Communication Technology (ICT) can be used for the surveillance of communicable disease [41]. The challenges and issues in the ICT Industry were presented in [42]. While the role and impact of ICT in improving quality education was discussed in [43].

METHODS

Data and records of patients suffering from various NEGLECTED TROPICAL DISEASES (NTDs) were collected from Specialist Hospital, Jalingo and the Primary healthcare centers across governments in Taraba State Nigeria. Study location : Bali, Taraba State, Nigeria Study Duration: January 2023 to August

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2023.

Schistosomiasis/Onchocerciasis is a variant of NTDs. The reported or treated cases of Schistosomiasis/Onchocerciasis in Taraba State, Nigeria in 2021(Table 1) is an attestation of the disease in 2021. The administered questionnaire was done and a total of 480 records was returned. Validation of the data was done with SPSS version 27. The report of the analysed records is in Table 2

Table 1: Number of Reported or treated cases of Schistosomiasis/Onchocerciasis in Taraba State, Nigeria in 2021

Number of Reported or treated cases of Schistomomiasis/onchocersiasis in Taraba State, Nigeria for 2021

LGA	GENDER		AGE GROUP	
	Male	Female	Below 18	Above 18
ARDO KOLA	35758	48977	31181	53554
BALI	199896	263595	162222	301269
DONGA	65592	78249	46187	97654
GASHAKA	43239	53632	33251	63620
GASSOL	126321	134817	100925	190213
IBI	42676	50323	40161	52838
JALINGO	67102	79519	56526	90095
KARIM LAMIDO	100185	116215	91421	124979
KURMI	46844	54548	34626	66766
LAU	46528	60649	42221	64956
SARDAUNA	113343	136854	91637	158560
TAKUM	65028	83944	55668	93304
USSA	42675	53394	35177	60892
WUKARI	114039	158468	95377	177130
YORRO	44650	54530	36515	62665
ZING	59803	77633	48413	89023
TOTAL	1213679	1505347	1001508	1717518

The reported cases of NTDs in 2021 and Figures 2 and 3 indicates that the local government that has the highest number (301269) of people above 18 years that are suffering from NTDs and Ibi local government has the least (52838). For the, reported cases of those below age 18Bali local government has the highest figure (162222) while the local government with the least figure is Ardo-Kola (31181), Also the local government with the highest reported cases of those above 18 years is Bali local government. It was also evident that Bali local government has the highest number of the infected males (199896) while Ardo-Kola local government has the least number of the infected male (35758). From the report Bali local government has the highest number of infected female people (263595) and Ardo-Kola local government has the least (48977).

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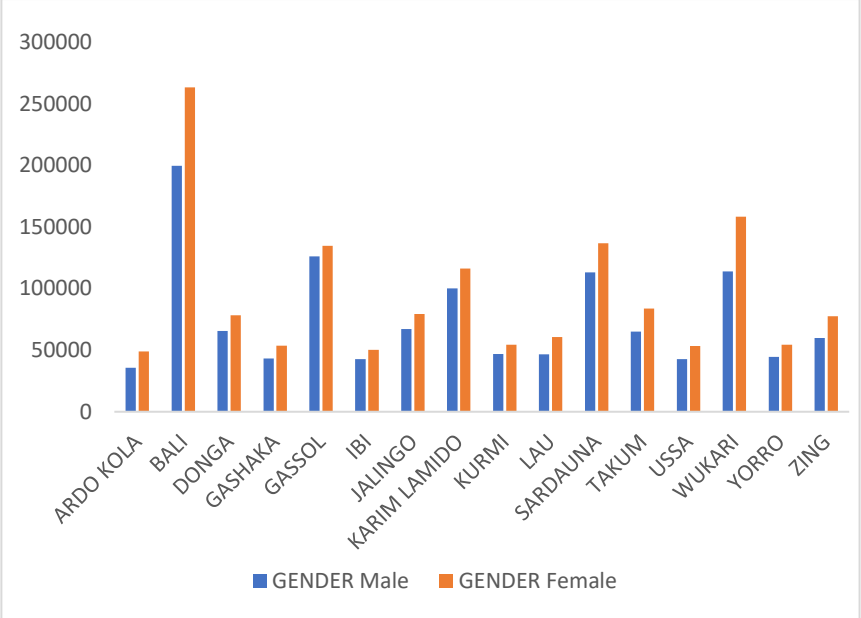

Fig. 2 Number of Reported or treated cases of Schistosomiasis/onchocerciasis in Taraba State, Nigeria for 2021 by Gender

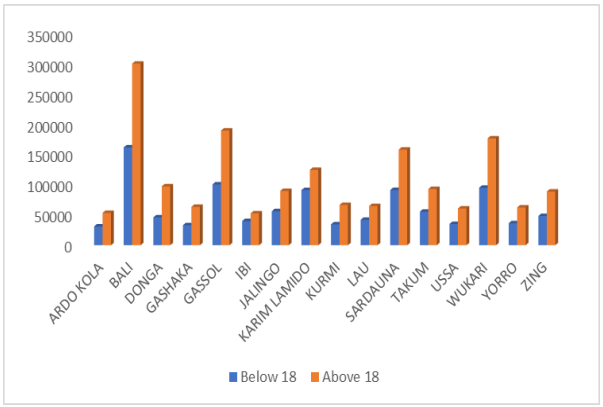

Fig 3. Number of Reported or treated cases of Schistosomiasis/onchocerciasis in Taraba State, Nigeria for 2021 by Age Group

Table 2 The report of the analysed records of NTDs in Taraba state

	Variable	Male	Female	Below 18	Above 18	No	Yes	Total
1	Gender	296	184					480
2	Age			30	450			480
3	Availability of Toilet facilities					341	139	480
4	Hand washing facilities in Toilet					439	41	480
5	Bathing in stream or river					80	400	480
6	Washing of clothes in river					134	346	480
7	Fishing from stream or river					105	375	480
8	Playing in stream or river					91	389	480
9	Swimming in steam or river					107	373	480

The validated data from the respondents to the administered questionnaire on NTDs in Taraba state (Table 2) and Figure 4 shows that 62% of the respondents are male while the female are 38%.

Also, from Table 2 and Figure 5 it is apparent that majority of the respondents are above 18 years (94%)

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while those below 18 years are only 6%.

In Table 2 and Figure 6, respondents that affirmed that Toilets facilities were not available was 71% and those that said there are toilets facilities was 29%. Those that said there are hand washing facilities in the toilets were 9% and most of them (91%) said there no hand washing facilities in the toilets. Most of the respondents (83%) Bath in streams or rivers and those that does not bath in streams or rivers are 17%. It is evident that most (72%) of the respondents washes their clothes in either streams or rivers while 28% does not. Furthermore, those that are fishing from the streams or rivers are 78% and those that does not are 22%. Playing in the steams or rivers is enjoyed by 81% of the respondents while 19% does not. Swimming in streams or rivers is done by 78% of the respondents and 22% distance themselves from such act.

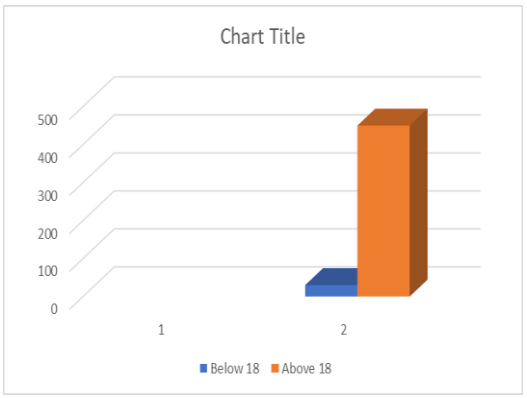

Fig. 4 Respondents by Age

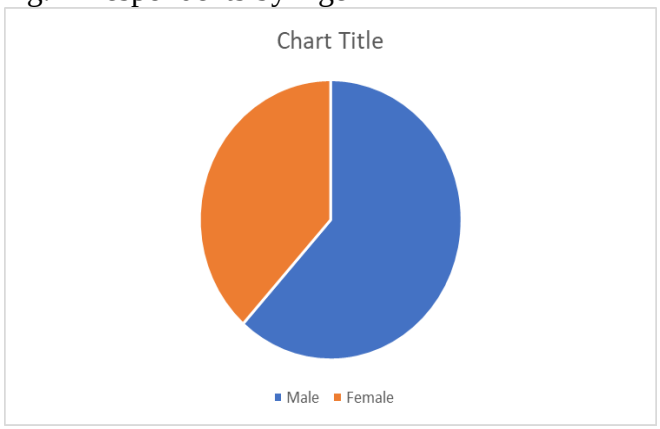

Fig 5 Respondents by Gender

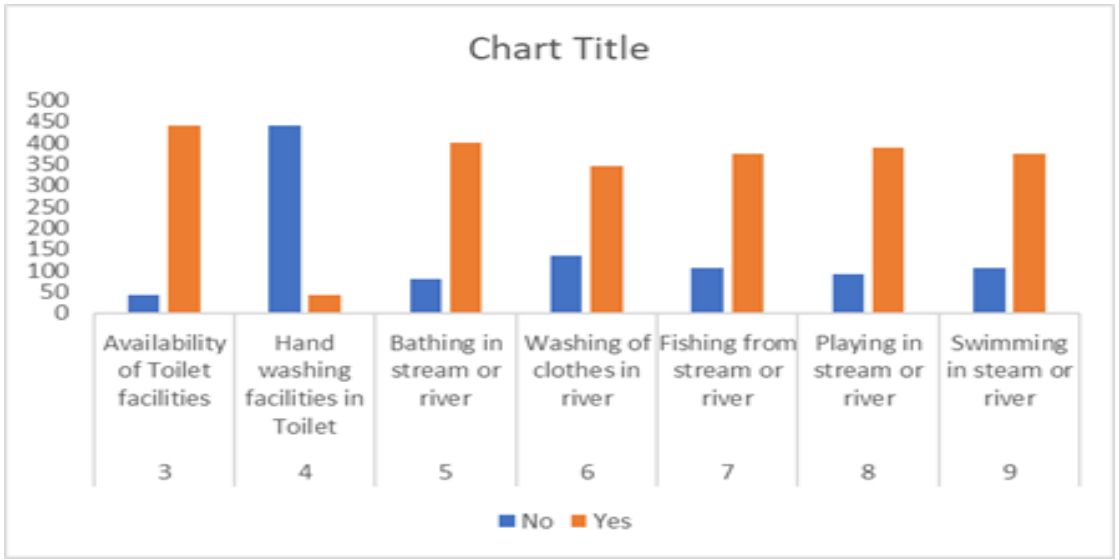

Fig. 6 Respondents by activities

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DISCUSSIONS

NTDs are water borne disease and from the findings of this study; Toilets facilities were not available (confirmed by 71% respondents), most of them (91% of the respondents) said there are no hand washing facilities in the toilets. Most of the respondents (83%) bath in streams or rivers and. It is evident that most (72%) of the respondents washes their clothes in either streams or rivers Furthermore, those that are fishing from the streams or rivers are 78%. Playing in the steams or rivers is enjoyed by 81% of the respondents. Swimming in streams or rivers is done by 78% of the respondents. What a picture of a completely unhygienic environment?

RECOMMENDATIONS

1. Good source of water should be provided for the people
2. Toilets facilities must be made available to the citizens with accompanying hand washing facilities even in the public places.
3. Bathing, washing of clothes of utensils, Playing, swimming and fishing from streams or rivers should be discouraged and where necessary it should be controlled.
4. Periodic enlightenment by healthcare workers should be done periodically to sensitize the people
5. Village heads should be moblised to encourage their subjects from time to time on the need to keep healthy environment always.

CONCLUSION

In this study, an evaluation of the neglected tropical diseases (NTDs) with ICT has been presented in a modest manner. Questionnaire was administered, anlysed and tested to validate its accuracy and usefulness. If the suggested recommendations are followed, then the outbreak of NTDs will reduce or completely eradicated.

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