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Assessment of basic sanitation and its implication for disease control in Bayelsa state, Nigeria

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Abstract

Sanitation is fundamental to the health and general wellbeing of humans in every society. Unfortunately about 1.1 billion people who lack access to improved sanitation facility in the world practice open defaecation, resulting in approximately 2.4 deaths and 7% of total disease burden. This survey was carried out to assess the availability of improved facilities in three (3) rural communities of Bayelsa State, Nigeria in 2014. The specific objectives were to determine the sanitation coverage, methods of excreta disposal and commonly reported cases of excreta related diseases. A total of 260 households were randomly selected. The design for the study was descriptive cross sectional, with the use of random sampling, questionnaire survey, oral interview and observational checklist as the means of data collection. The Statistical Package for Social Sciences (SPSS) and Microsoft Excel version 2.0 were employed for data analysis. The results were presented in frequency tables, bar charts, mean, percentages and chi square. The major findings were that 47% of the respondents interviewed had access to improved sanitation, while a larger proportion (50%) used unimproved sanitation facilities. The methods of excreta disposal adopted by the households were flush toilets used by (42%) of the respondents being the majority, followed by pit latrine (22%), open defaecation (16%), public/communal toilets (8%) and 3% V.I.P utilization. The review of medical records at the primary health centres on prevalence of diseases revealed more malaria cases (37%), including typhoid fever (29%) and diarrhoea (12%) among the common excreta related diseases. Therefore, the study recommended urgent action by the government and all stakeholders to raise the level of awareness and increase the funding of sanitation projects to enable more people have improved excreta disposal facilities (sanitary toilets) and limit exposure or prevention of disease transmission in the state.

Keywords: Basic sanitation, excreta disposal, improved sanitation

Introduction

Access to improved sanitation services is critical to the promotion of good health and socio-economic wellbeing. That is why sanitation combined with hygiene practice is enshrined in the traditional culture and religious life of societies in the world. It was for these reasons that the United Nations (2002) recognized water and sanitation as a fundamental human right. This was borne out of the fact that the right to water and sanitation guarantees human dignity and enjoyment of other rights which include but are not limited to food, housing and clothing. According to the Chair, UN Secretary-General Advisory Board on Water and Sanitation (Netherlands) Prince Willem Alexander, the right to sanitation means, access to and use of excreta and waste water facilities and services that ensure privacy and dignity, as well as a clean and healthy environment for all. Besides, sanitation is not about hygiene promotion and disease prevention alone, but it includes the dignity and right or entitlements of every individual (Water Aid, Fresh Water Action Network and Rights and Humanity 2012).

In the light of the foregoing the United Nations in 1980 launched the International Drinking Water Supply and Sanitation Decade (1981-1990) and declared 2008 the International Year of Sanitation (IYS) to create awareness and mobilize support towards increasing access to improved water supply and sanitation because of the enormous benefits. According to the Water Aid Director of Policy and Campaign, Margaret Batty access to sanitation and water are the key building blocks of progress on child health, education and gender equality. Sanitation significantly impact human health in so many ways. For instance, Amadi (2001) citing UNICEF and CASSAD (2003) reported that lack of sanitation contributes to 41%

dysentery, 36% diarrhoea, 20% cholera, 32% typhoid fever and 21% parasitic worms. In economic sense, investment in sanitation leads to 390 million preventable cases of diarrhoea annually, including health related monetary gains of 5.2 billion U.S dollars. The total economic benefit from sanitation is 66 billion U.S dollars. Estimates from WHO evidence-based studies further showed that approximately 2.4 billion deaths and 7% of the disease burden are preventable annually, if the world population are provided with safe drinking water and improved sanitation. Under-five children are the most vulnerable to diseases caused by poor sanitation scenarios, mainly diarrhoea with mortality rate of approximately 5.20% (WHO/ UNICEF 2000, WHO 2006 and WSP 2007).

In Nigeria, an estimated 200,000 children die of diarrhoeal disease and suffer 2-4 episodes of diarrhoea every year due to lack of improved sanitation, giving rise to stunted growth and poor mental development of children (Amadi 2000 *et al.* 2001a, Amadi and Mba 2001). In terms of gender equality, access to sanitation leads to increased enrolment and school attendance of girls. Provision of sanitary toilets also ensures privacy and frees women and girls from sexual assault or harassment by men.

In spite of the benefits of sanitation the WHO/UNICEF JMP reports still show a major shortfall in the number of households having improved sanitation, particularly Sub-Saharan Africa with only 35% of its population having access to improved sanitation and 25% practicing open defaecation. As a result of the low level of achievement, the region was described as seriously off-track of MDGs target for sanitation in 2012 (WHO/UNICEF JMP 2012).

In Nigeria, 23% of households in urban areas and 62% of households in rural communities use unimproved sanitation facilities with 16% of urban households and 40% households in the rural areas having no toilets at all (NDHS 2013). A Water Aid survey in 5 slum settlements in Lagos (Nigeria) revealed that 1 out of 5 women who had no access to improved toilets faced sexual harassment or threats and experienced physical assault by men when going to toilet. About 67% of the women interviewed said they always felt unsafe without toilet, especially when using communal or public toilets or bush defaecation. Studies in the West African sub region and other developing countries of the world have similar results of poor sanitation with health implications (WaterAid UK site 2012 and Abdulwahid 2011).

The sanitation situation in Bayelsa State is highly deplorable with only 10-20 households having toilets/latrines facilities adjudged to be improved, but are shared by other households. Statistics from the NDHS(2008) as reported by EarthWatch (2010) ^[10] indicate that the percentage of households using sanitary toilets in the State was 6.4%. This figure later increased to 14.2% being the lowest sanitation coverage in the country, below the national average of 58%. A survey of some rural / coastal communities in Bayelsa State by Cooney *et al.* (2008) ^[8] found that defaecation in the river, including dumping of excreta instead of using pit latrine, were the sanitation practices of the people as stated above. In addition, Nwankwo, Amadi and Zacchaeus (2010) ^[27] and Earth Watch (2010) ^[10] among others provide further evidence on the prevailing poor sanitation and incidence of diarrhoea, cholera, typhoid fever, schistosomiasis etc. in the area. These were attributed to pollution of water in the rural communities as a result of

indiscriminate excreta disposal (Bayelsa State Economic Empowerment and Development Strategy- BY-SEEDS 2004) ^[6].

Materials and Methods

The study adopted the descriptive cross sectional design, using a well structured questionnaire and oral interview for data collection. Data were analyzed with the aid of Statistical Package for Social Sciences (SPSS) and Microsoft Excel version 2.0 and results presented in frequency tables, bar charts, mean, percentages (%) and chi square. These approaches had been successfully used in similar studies to achieve remarkable results and therefore found suitable for the study (Akpala 1994 and Abdulwahid 2011) ^[2]. The study setting was Bayelsa State, South-South geopolitical zone of Nigeria where about 90% is covered by water and 10% land. The sample for the study was drawn from randomly selected households from 3 senatorial zones which comprised Imiringi Community in Ogbia Local Government Area, Sampou Community in Kolokuma / Opukuma Local Government Area and Tungbo Community in Sagbama Local Area, representing Bayelsa West, Bayelsa Central and Bayelsa East Senatorial districts, respectively. The sample size for the study was determined by applying the single population proportion formula of $n = Z^2 P (1-P) / d^2$, where 'n' represents the sample size. Based on this a total of 260 was determined out of which 91 was recorded as non responses, leaving 169 as actual responses (Abdulwahid I. Mohammed 2011).

The selection of communities for the study was based on accessibility, security, transport cost, and availability of telecommunication facility were main criteria. In each of the three selected communities a list of all the compounds or quarters was compiled to form the sample frame from which the 260 households were randomly selected by balloting (Akpala 1994) ^[2]. Purposive and simple random sampling techniques were adopted in the selection of compounds and households, respectively. A respondent from the selected household was interviewed following informed consent. The eligibility criteria for being a respondent were: (i) household head who is the bread winner male or female, (ii) female household head was given priority because she is both knowledgeable about domestic water supply and sanitation and (iii) where the two were not available, a female child above 18 years who was familiar with the house work about water and sanitation duties of the household was interviewed. Housing units in which nobody was found (vacant), or households in which no eligible person was present for interview after at least 3 times visits were recorded as non-responses. In all, 260 households were randomly selected by balloting.

The researcher assisted by Environmental Health Officers working in the area and principal members of the chief's council in each of the communities studied administered the questionnaire to the household heads to solicit information on access to improved sanitation. Pidgin English or the local dialect (for heads of household who could not speak or did not understand English language) was used as the means of communication to obtain necessary information from the respondents. Those who were not covered in the questionnaire survey participated in the oral interview on issues relevant to the study that were not captured by the questionnaire. Sanitary inspection of the households was carried out, using observational checklist to determine the

hygiene practice of the respondents, concerning the use and maintenance of toilets to supplement information from the questionnaire survey and oral interview.

Results

Table 1 showed that the proportion of respondents with access to improved sanitation comprising 47% was less than the respondents (50%) who used unimproved sanitation facilities in the communities studied. A breakdown of the figures indicated that Imiringi community had the highest number of respondents using unimproved sanitation facilities (53%) and Tungbo community had more respondents having improved sanitation (71%).

As shown in table 2, a total of 70 respondents (41.4%) from the three communities used flush/poor flush toilets, 22.5% had pit latrines, 16% practised open defaecation in the river or bush, while 8% used public/ communal toilets. Those who used V.I.P toilet were the least (2.9%). In all Imiringi community had the largest proportion of households with flush toilets (59.7%) and Tungbo (34.7%), while Sampou community recorded the highest score of open defaecation in the river and nearby bush.

Available Primary health care centre records of common excreta related diseases from two out of the three communities studied namely; Sampou and Tungbo communities were reviewed between January to May 2013. From the figure 1, malaria (367%) topped the number of reported cases of prevailing sanitation related diseases in the study area. Typhoid fever (29%) and diarrhoea (12%) were the next on the list of cases in order of prevalence of common diseases, respectively. The study further shows that Tungbo community recorded 40.4% of malaria cases more than Sampou community with 35%. About 32% cases of typhoid fever and over 10% of diarrhoea were reported at Sampou community while Tungbo had 26% cases of typhoid fever and 13% cases of diarrhea. These are represented with bar chart (see figure 20). The test of hypothesis was statistically significant at 5% level with probability value of $p > 0.05$, hence the null hypothesis was rejected. Thus, the study established the evidence of the prevalence of water borne diseases in the communities.

Discussion

One of the major challenges facing the rural communities in Bayelsa State that adversely affects the health and wellbeing of the residents is lack of improved sanitation facilities for safe excreta disposal. It is a fundamental problem which increases disease transmission and human suffering as depicted in table 3 from the review of Primary Health Care Centre records. This study revealed the low level of access to sanitation facilities in the three communities sampled which was consistent with previous studies in the literatures. But despite the enormity of the challenges of excreta disposal and the consequences the people do not perceive these as a serious problem because the rivers serve as the means for defaecation and dumping of waste (NDHS 2013, NEWSAN 2013, UNICEF 2013, Ordinioha 2011, Nwnakwo, Amadi and Zacchaeus 2010, Earth Watch 2010 Cookey *et al.* 2008) [25, 28, 8, 42].

A summary of table 1 indicated an average total of 47% access to improved sanitation facilities, while 50% of the respondents used unimproved sanitation facilities in the

sampled population. The p-value obtained from the hypothesis tested was not significantly different from the null hypothesis (p -value = 0.301) which indicated that lack of access to sanitation facilities for safe excreta disposal in these communities was very critical. It will be recalled also that 4.6% and 10% sanitation coverage were achieved in some rural coastal communities of Bayelsa State in 2010 according to earlier studies by Earth Watch (2013), BY-SEEDS (2004) [6], as well as the 8.4% and 31% progress reported by the UNICEF (2013) [42] and WHO/UNICEF Joint Monitoring Programme on MDGs (2012Update). Furthermore, information obtained from oral interview conducted during the survey showed the lopsided distribution of water supply and sanitation projects at the ratio of 1(one) V.I.P latrine to 48 bore holes provided through the State MDGs intervention programme for rural communities.

Table 2 also showed that the proportion of respondents who had access to improved sanitation, such as flush / poor flush (41%) was higher, yet those who used unimproved sanitation systems which comprised traditional pit latrine without cover (23%) and open defaecation (16%) were considerably higher. The largest proportion of households with flush toilets (59.7%) was recorded at Imiringi and Tungbo (34.7%), compared to Sampou community with the highest number of households defaecating in the river and nearby bush which is the common traditional method of excreta disposal of the people. This suggests the high prevalence of typhoid fever (32%) in the community. Previous assessments of the riverine/coastal communities in Ogbia and Ekeremor Local Government Areas of Bayelsa State carried out by Cookey *et al.* (2008) [8] clearly revealed that open defaecation in the river and indiscriminate dumping of excreta were common practices of the people. These corroborated the findings of the present survey. Studies by Nwankwo, Amadi and Zacchaeus (2010) [27] and Earth Watch (2010) among others provide further evidence. These account for the increasing incidence and frequent complaints of diarrhoea, cholera, typhoid fever, schistosomiasis etc., especially in the rural communities.

There was substantial evidence provided in table 3 that malaria, typhoid fever, diarrhoea, dysentery, gastro enteritis, etc., posed serious threats to the health of community residents, due to lack of access to improved sanitation facilities for safe excreta disposal in the communities studied. From the present study, malaria (36.7%), typhoid fever (28.9%) and diarrhoea (12%) topped the list of sanitation related diseases in ascending order of prevalence, while gastroenteritis (5.5%) was the lowest. The highest incidence of 40.4% of malaria cases occurred at Tungbo community, while Sampou community recorded 35%. Conversely, Sampou community had fewer cases of malaria than Tungbo community. There were also few cases of gastroenteritis (5%) at Sampou community and none for dysentery, compared to Tungbo community with 9.4% cases of dysentery and none for gastroenteritis. Further statistical analysis and hypothesis tested suggested that indeed the prevailing waterborne/ sanitation related diseases exist in the two rural communities which corresponded with what were reported by Sridhar 2013, Ordinioha 2011, Nwankwo, FMOH 2011, Amadi and Zacchaeus 2010, Earth Watch 2010, Cookey 2008 and BY-SEED 2005 [27, 28, 8].

Table 1: Access to sanitation facilities in the study area, 2013

Study Area/Location	Improved Sanitation	Unimproved Sanitation
Imiringi community	11 (46.67%)	39 (52.92%)
Sampou community	8 (23.03%)	22 (68.75%)
Tungbo community	44 (70.97%)	18 (29.01%)
Total	63	79
Average Total P value	21 (46.89%) 0.310	26.33 (49.92%)

Table 2: Methods of excreta disposal in the study area, Bayelsa State

	Imiringi community		Sampou community		Tungbo community		Total	
	N	%	N	%	N	%	N	%
Flush/poor flush	37	59.7	7	21.9	26	34.7	70	41.4
Septic tank	5	8.1	1	3.13	6	8.0	12	7.1
V.I.P Latrine	2	3.2	0	0.0	3	4.0	5	2.9
Public/ communal toilet	12	19.3	2	6.25	0	0.0	14	8.3
Pit latrine	5	8.1	7	21.9	26	35.0	38	22.5
Bush/river Defaecation	1	1.6	13	45.6	13	17.3	27	16.0
Don't know	0	0	2	6.25	1	1.3	3	1.8
Total	62	100	32	100	75	100	169	100
p-value								0.301

Table 3: Reported cases of sanitation related diseases from Primary Health Centre Records

Sample Location	Sampou community		Tungbo community		Total		
	N	(%)	N	(%)	N	(%)	
Prevailing Diseases							
Diarrhoea	4	10.8	7	13.2	11	12.2	
Dysentery	2	5.4	-		2	2.2	
Malaria	13	35.1	23	40.4	33	36.7	
Measles	6	16.2	4	7.5	10	11.1	
Gastro-enteritis	-		5	9.4	5	5.5	
Typhoid fever	12	32.4	14	26.4	26	28.9	
Total	37	100	53	100	90	100	
p-value	0.000						

Conclusion

The findings of the study confirmed the bottom position of Bayelsa State with the lowest sanitation coverage among the 36 states nationwide, due to low priority and the high level of neglect of sanitation by the government over the years. The consequences of this negative attitude have been characterized by indiscriminate dumping of human excreta / open defaecation, pollution of the environment, poor food hygiene quality, contamination of water supply, disease transmission and their vectors/pest. The situation is worse in the rural areas, where infrastructures are non-existent (Earth Watch 2010 and BY-SEEDS 2004) ^[8, 6].

Recommendations

To address the various issues which this study raised we recommended that the Ministry of Water Resources at Federal and State levels should embark on advocacy to highlight the strategic role of water and sanitation, including hygiene (WASH) in development issues of government and lobby the National and State Assemblies to increase budgetary allocation for sanitation, especially for rural communities. The State and Local Governments should create separate budget lines for sanitation projects to give the needed attention it deserves for the benefit of the rural communities.

A law to legalize and give recognition to water and sanitation as a fundamental human right not only a human need should be enacted and enforced in the 36 states and all the local government areas.

The State MDGs Office for water supply and sanitation

should ensure that provisions for the operations and maintenance of such facilities by the Community Development Committees (CDCs) of benefitting communities are included in the programme for effective service delivery and sustenance. Contracts for water supply and sanitation projects should be awarded to competent persons or companies with track records and only communities in dare need selected for allocation of such projects to correct the imbalance in distribution and ensure equity.

As a matter of urgency the State government should adopt the National Environmental Sanitation Policy, 2005 as well as set the necessary machinery in place for the launching and implementation of the policy in state and the local government areas for promotion of sanitation services. This will help to create awareness and motivate the public to practice good sanitation and hygiene behaviours, with more emphasis on community led total sanitation (CLTS) for rural communities.

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