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POST-FLOOD MORBIDITY PATTERN IN AN UNDERSERVED COMMUNITY: A CASE STUDY OF ADANKOLO 'EGBE/AGBAYI' SETTLEMENT IN LOKOJA, KOGI STATE.

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ABSTRACT:

Flooding is a natural disaster that can change the morbidity pattern in an area, cause epidemics, and introduce new diseases. These health implications are worse in developing countries with weak health systems like Nigeria. This paper studies the post-flood morbidity pattern in a flood-prone settlement of Adankolo, Lokoja, in Kogi State of Nigeria, which was completely submerged between September and early October 2022, in one of the worst flood disasters of the state.

The study design was mixed; as both quantitative and qualitative data were utilized. The Primary Health Centre (PHC) and the Patent Medicine Stores (PMS) in the study area were the sources of data. The health records of the PHC concerning the morbidity pattern during a period of three months before and after the flood was used. A semi-structured one-on-one interview was also carried out in the PMS concerning commonest post-flood health complaints.

The results show poor patronage of the PHC for primary care and increased patronage during the post-flood period. Malaria (22%), Upper respiratory tract infection (16.9%), and Hypertension (15.3%) were the most reported diseases; followed by Gastrointestinal symptoms (13.5%), insomnia and Myalgia (11.9%), and Measles (10.2%). There was an unusually high incidence of skin diseases like scabies, and cutaneous larva migrans.

Resettlement of flood-prone settlements and flood mitigation measures should be prioritized. More commitment towards universal health coverage and increasing patronage of the PHCs should also be made. Emergency provision of medical care like immunizations and provision of medicines to settlements post-flood should be a priority.

Keywords: Flooding, Post-flood, Morbidity pattern, Adankolo,

INTRODUCTION

In the last 20 years, flooding has been the most frequent type of natural disaster, accounting for 47% of all recorded natural disasters and affecting 2.3 billion people worldwide. (United Nations, 2015). Flooding has been observed to be related to a wide range of adverse health outcomes. Out of the 161 floods that occurred throughout the world in 2016, 43% of them occurred in Asia, 23% in the Americas, and 12% in Europe and it adversely affected more than 74 million people. (Patterson, 2018). Since 2000, floods have accounted for 66% of disasters recorded in Africa. These have been concentrated in East Africa with South Sudan, Sudan, Somalia, Ethiopia, and Kenya regularly among the African countries having the largest numbers of people affected by floods. Reflective of the unpredictability of flooding from year-to-year, this list varies greatly and countries from West Africa such as, Nigeria, Ghana, and Niger as well as southern Africa (Malawi and Angola) are at times, seriously impacted. (Africa Center for Strategic Studies, ACSS, 2022)

Nigeria endured its worst flood disaster in over a decade between June and October 2022, with over 600 people killed and 1,500 injured and numerous persons experiencing different forms of morbidities across the country's 32 states, including Abuja and Kogi state which is our state of study. As a result, 790,000 persons were forced to abandon their homes, with 1,400,000 people

affected across the country. Extreme rainfall and the release of water from the Lagdo Dam in neighboring Cameroon were the leading causes of the extensive flooding experienced that year. (Abdulrakib et al., 2022.)

The adverse human health consequences of flooding and its after effects are complex and far-reaching which includes both immediate and long-term health effects. Flood worsens pre-existing health challenges. It also challenges the determinants of good health like safe drinking water, food security and shelter. Thus, drinking water contamination from sewage, agricultural waste, industrial waste or chemicals can lead to increase in water borne diseases like cholera and typhoid. (Suhr and Steinert, 2022). The resultant poverty from flood also negatively impacts the overall health. These ultimately will lead to a change in morbidity pattern as some diseases will become more prevalent in communities after floods.

STATEMENT OF PROBLEM/ JUSTIFICATION:

Flooding has been found to be a periodic natural disaster that occurs periodically in Nigeria at varying degrees in the different states of the country Nigeria. Kogi state which is a confluence state and Lokoja the confluence town is one of the worst hit where it has been observed that following the flood, there is increase in disease burdens of concern ranging from psychological to biological. Post flood health consequences could be as a result the environmental conditions that the people are exposed to such as over-crowding of make-shift settlements, inadequate basic amenities such as access to portable water, poor nutrition, skin lesions because of overcrowding, viral infections and malaria.

The study site is a flood prone area which experiences flooding almost annually, with the worst case so far in 2022 where almost the whole community was displaced. It is therefore important to study the morbidity pattern in this settlement to obtain data that will be used by policy makers in the provision of health services to the settlement. Data from this study may also be used to make a case for resettlement and relocation of this community to reduce the burden of diseases, loss of productive labour force, and government expenditure as a result of flooding.

AIM OF STUDY

To determine the post-flood morbidity pattern in Adankolo community with a view to improve health preparedness for flood disasters in the state.

OBJECTIVE

1. To establish the morbidity pattern of the community for a period of three months before the flood.
2. To compare the morbidity pattern of the community in the aftermath of the flood (three months after) to its pre-flood pattern.
3. To ascertain the commonest presentations in the Patent Medicine Stores in the aftermath of the flood (3 months after).

METHODOLOGY:

Study area:

The Adankolo settlement is a community located in the sub-urbs of Lokoja, the capital city of Kogi State in Nigeria. Lokoja is located between latitudes 7°45'N and longitude 6°45'E and lies on the West bank of the river Niger, close to the confluence with River Benue, Nigeria's two major rivers. The population of Adankolo from the 2006 census is 22,906 and it has been identified as a flood prone area, subject to repeated floods. (Alabi, 2009). The Adankolo settlement is divided into the original settlement, referred to as 'Egbe/Agbayi' which is mostly along the river Niger bed, and a new settlement which is further inland and referred to as the Adankolo new layout. This study was carried out in the original Adankolo settlement (Egbe/Agbayi) located mostly along the river bank.

Flooding is almost a perennial event in this settlement, with the flooding of September 2022 being the worst in terms of displacement and extent of damage, followed by the 2012 flooding. (Adu, 2016). The whole community on the river bank was submerged during the flood in the month of September 2022. Most people went to live with relatives while others lived in a

makeshift internally displaced camp provided by the State government in a nearby primary school. They returned to their settlement in the month of October 2022.

Study population and health seeking behavior:

The area is served by a Primary Health care Centre (PHC), which serves as the basic unit of healthcare. There is no other formal private or government hospital in this area. There are also about 14 Patent Medicine Stores in this settlement and most of the dwellers patronize the patent medicine stores (PMS) for primary care. There is also, a delivery center owned by a Traditional Birth attendant within the settlement.

Results from a mini- survey done 2 weeks before data collection reported poor patronage of the PHC by the community and a heavy reliance on the patent medicine stores (PMS) as a first point of call for health -related consultations. These PMS are unstructured and run by business people with some informal training on health. They have very sparse records of the patients seen and complaints. The community dwellers also patronize secondary health centers and the teaching hospital which are located within the capital city mostly for their health needs.

Data Collection/ Methods:

Data was collected from the health providers in the community. A mixed method was chosen to have a better information of the pattern of diseases in the area after the flood as most of the health providers had no records. The period after the flood was considered to be from October to December 2022 which matches with the first three months after return of the displaced community dwellers to their homes.

Qualitative data was collected from the records of the PHC as the only official and structured healthCentre in the settlement. The records of the pattern of diseases form October to December 2022 were obtained after permission from the authorities in the PHC and Ethical clearance was obtained. Records from a period of three months before the flood (June- August 2022) was also got for comparative purposes. September was not captured because the community, including the PHC was flooded during this period.

Qualitative data was collected by semi-structured, one-on-one interviews of the health providers in the community (9 out of the 10 PMS and the Delivery Centre in the settlement). After 10 interviews, a saturation point was reached where there was constant repetition, and no new information given concerning the pattern of diseases after the flood and most drugs sold after the flood.

DATA ANALYSIS:

The quantitative data was collected and cross tabulated. A comparison was made between variables like age, sex, and disease patterns in the period before the flood and after the flood. Tests of significance were calculated and data analyzed using SPSS version 21. P value was set at a significance level of 0.05 with a 95% confidence interval.

The qualitative data was recorded and transcribed. It was then analyzed and recurring themes of ailments and medications sold were noted.

ETHICAL CONSIDERATION:

Informed consent and permission were gotten from the PHC and PMS providers after clear explanation of the Research aim and objectives. They were assured that the records or information gotten was confidential and would be used for only research and policy making purposes. Ethical approval for the research was obtained from the State Ministry of health.

RESULTS AND DISCUSSION

SOCIODEMOGRAPHIC CHARACTERISTICS

	JUNE-AUGUST (PRE-FLOOD)	2022	OCTOBER- DECEMBER (POST-FLOOD)	TOTAL 2022
SEX				
MALE	5 (22.7%)		25 (42.4%)	30 (37.0%)
FEMALE	17 (77.3%)		34 (57.6%)	51 (63.0%)
TOTAL	22 (100%)		59 (100%)	81 (100%)
X²- 2.65	P- 0.1034			

AGE (yrs)

0-5	4 (18.2%)	13 (22.0%)	17 (21 %)
6-12	5 (22.7%)	8 (13.6%)	13 (16.1%)
13-19	2 (9.1%)	0 (0%)	2 (2.5%)
20-29	4 (18.2%)	3 (5.1%)	7 (8.7%)
30-39	1 (4.5%)	11 (18.6%)	12 (14.8%)
40-49	2 (9.1%)	11 (18.6%)	13 (16.1%)
50- 59	1 (4.5%)	4 (6.8%)	5 (6.2 %)
60 and above	3 (13.7%)	9 (15.3%)	12 (14.8%)
TOTAL	22 (100%)	59 (100%)	81 (100%)
X²- 12.71	P – 0.08		

PATTERN OF DISEASES	PRE-FLOOD	POST- FLOOD	TOTAL
Malaria (Febrile illness, headaches, loss of appetite, generalized weakness)	11 (50%)	13 (22.0%)	24 (29.6%)
Gastrointestinal Symptoms	5 (22.7%)	8 (13.5%)	13 (16.0%)
Skin Rashes	1 (4.5%)	1 (1.7%)	2 (2.3 %)
Hypertension	2 (9.1%)	9 (15.3%)	11 (13.5%)
Upper respiratory tract infection	3 (13.7%)	10 (16.9%)	13 (16.0%)
Myalgia, Insomnia	0 (0%)	7 (11.9%)	7 (8.3%)
Dyspepsia	0 (0%)	2 (3.4%)	2 (2.3%)
Measles (Body rash, fever, abdominal symptoms)	0 (0%)	6 (10.2%)	6 (7.4%)
Injury	0 (0%)	2 (3.4%)	2 (2.3%)
Irregular period	0 (0%)	1 (1.7%)	2 (2.3%)
TOTAL	22 (100%)	59 (100%)	81 (100%)
X² – 12.87	P – 0.168		

One-on-one Interview:

Thematic content analysis: Ailments identified

Recurring ailments: Skin rashes/ Itching, Scabies (rashes in the armpit and groin that can be described as 'sweet'), Creeping eruptions under the skin (Cutaneous Larva Migrans), 'Malaria', Snake bite, Vaginal discharge, Diarrheal disease, and Fungal infection of the feet.

Most drugs sold: Chlorpheniramine, Loratadine, Ciprofloxacin, Calamine lotion, Erythromycin, Tetracycline, Ketoconazole, Metronidazole, Griseofulvin, Anti malaria, Cream (Antibiotic, Antifungal, and Anti-inflammatory), and Anti snake venom.

DISCUSSION OF RESULTS:

The results from the PHC, which is the only official health post in the area showed that the community patronage of the Centre is poor. The total number of patients seen in the PHC within three months was only 22 patients before the flood, and 59 patients in the aftermath. This is similar to the study by Osadeke (2019) that reports low utilization of PHCs in Nigeria. More females were also reported to access the PHC which is similar to the finding by Rasak (2013) in his study. His explanation that this is probably due to the fact that there is a perception that PHCs are for antenatal care and immunization is also plausible in this case.

A higher percentage of the clients were children between the ages of 0 to 12 years (40.9%, and 36.6% before and after the flood respectively) and women of childbearing age (20-39 years; 22.7%, and 23.7% before and after the flood respectively). This is similar to the pattern reported by Odefadehan, and Adereti, (2021) in Osun State, Nigeria with the finding that immunization and maternal and child care services were the most services recorded by the studied PHCs in the area; which would coincide with this age group.

In the aftermath of the flood, the utilization of the PHC increased by 168% (from 22 clients to 59 clients) within the same period of time. Even though this was not statistically significant, the increase could be associated with the increased burden of diseases usually recorded after a flood (Suhr and Steinert, 2022). The age and sex distribution of the clientele was similar in both periods. Concerning the post-flood morbidity pattern; Malaria (22%), Upper respiratory tract infection (16.9%), and Hypertension (15.3%) were the most reported diseases. This was followed by Gastrointestinal symptoms (13.5%), insomnia and Myalgia (11.9%), and Measles (10.2%).

There was a need to compare the above pattern with the pre-flood morbidity pattern to establish if there was any significant difference in the pattern of diseases. A comparison shows a change from the predominant diagnosis of 'malaria' in the pre-flood period (50%) to complaints

of more diverse ailments like upper respiratory tract infections, measles, and several skin manifestations. Also there seems to have been an increase in the prevalence of Hypertensive diseases, myalgia and insomnia among the population after the flood

Additional data from the semi- structured one-on one interview of the operators of the patent medicine shops reports that in the aftermath of the flood, most people in the community complained of skin lesions and generalized body itching. The reported skin lesions were in two forms, with one described as extremely and 'sweetly' itchy, distributed mostly to the armpits, groin, interdigital clefts; while the other form was generalized lesions in form of small rashes that were itchy and scaly. Other symptoms described include 'crawling worms under the skin of the leg which was extremely itchy at night; Malaria (fever with generalized body aches and headaches), Diarrheal diseases, itchy Lesions in the inter digital clefts of the foot, snake bites, and abnormal vaginal discharge.

While most of the diagnosis of malaria was presumptive and based on symptoms of headache, fever, generalized body weakness and anorexia without laboratory confirmation, it is not surprising that malaria is an issue in this settlement. This is because malaria is an endemic disease in Nigeria especially in such low-lying plains with a lot of stagnant water and poor use of insecticide treated nets (Dawaki, et al, 2016). Also, Isiguzo, et al (2014) reports that the practice of making a presumptive diagnosis of malaria based on symptoms without diagnostic tests is still very common in Nigeria, especially in resource poor areas like in this study.

Viral infections like the upper respiratory tract infection and measles in children are not unexpected as prevalent conditions like overcrowding as a result of displacement, together with poor nutrition as a result of poverty make it easy for viruses to thrive. (Peiris and Madeley,2020). Overcrowding with poor hygiene can also account for the increase in cases of scabies and allergic skin diseases post flood in the community (Ugbomoiko et al., 2018).The lack of portable pipe borne water in the settlement worsened by contamination of the well water by dirty debris-carrying water(including sewage) could easily account for the increase in gastro intestinal diseases. Waddling bare-footed in dirty water is a common portal of entry by the skin

penetration of the larva of hookworms to cause Cutaneous Larva Migrans. (Maxfield, and Crane, 2022). The increased incidence of visits by clients who complain of non-communicable diseases like Hypertension, myalgia, and insomnia may be due to resultant poverty and inability to buy drugs. These symptoms have also been associated with anxiety disorders, post-traumatic stress disorders, and depression which are documented psychological ailments in aftermath of situations of loss of properties and accommodation like a flood. (Yan, et al, 2015; Mason, et al, 2010).

The above pattern of diseases is very similar to that reported by Thomas et al (2019) in Kerala, India, where the top morbidities post flood in the community were Acute Respiratory Infections (ARIs), generalized weakness and musculoskeletal pain, skin infections, diarrhea, and other gastrointestinal disorders. Kondo, et al (2002) also reported similar illnesses of malaria, respiratory infectious diseases, and diarrhea in the aftermath of flood in a community in Mozambique. This pattern also closely resembles a report by the World Health Organization (WHO) in Central Vietnam after the 2003 floods which showed that there was a change in the morbidity pattern from the pre-flood period and an increase in the incidence of acute diarrheal diseases, malaria, acute respiratory infections, and also conjunctivitis. Also just like in this study, it did not record a significant increase in the incidence of snake bites. (WHO, 2004). The results of this study however, differ slightly from that reported in Ajegunle, a community in Lagos State Nigeria after a flood. Gastrointestinal diseases (Cholera, and enteric fever) were the most reported diseases, followed by Malaria. (Chioma, et al, 2019). This maybe because there was no time frame in the reported study and the study population was the members of the community who may interpret every form of gastrointestinal disease as cholera and typhoid. Ajegunle is also heavily influenced by extreme overcrowding, high population density, and poor sewage disposal even during flood-free periods, making it generally more susceptible to cholera outbreaks.

The fact that there was no report of cases or symptoms consistent with the case definition of cholera even though cholera outbreak is a well-documented health effect of flooding was also unexpected. While this may be attributed to poor records by the PHC, it is worthy of note that

according to the NCDC data, there was no significant increase in cases of cholera in Kogi State, Nigeria within the period of October to December 2022 which coincides with the post-flood period. (NCDC, 2022).

LIMITATIONS

This study has some limitations which may affect the result of the study. They include:

1. Poor PHC data: Despite the poor patronage of the PHC in the area, its data keeping was also less than ideal and comprehensive. Thus, the results from the records may not be an accurate representation.
2. The ailments were not diagnosed using standard case descriptions and investigations; thus, some diseases may be misdiagnosed, especially if presentation is atypical.
3. Recall bias for the PMS operators: The information given by the PMS operators may be subject to recall bias as they may not accurately remember the complaints during the period in question.

CONCLUSION/ RECOMMENDATIONS:

This study has reported the health effects of flooding in a flood prone settlement in Adankolo, Lokoja in Kogi State of Nigeria. It reports that the morbidity pattern changed in the aftermath of flooding in the area from its usual pattern. It also reported that respiratory tract diseases, skin diseases, and gastrointestinal diseases were the main ailments recorded after flood in the area. These diseases are mostly communicable and its burden in these areas are worrisome. Diseases like scabies can be very worrisome and difficult to treat, especially given the living conditions of overcrowding and water limitation. These diseases can also lead to mortalities if not well treated, especially in children. Even though not an initial objective, this study also reports a poor patronage of the PHC, especially by the young people and men.

Based on the results of this study, we would therefore propose the following recommendations:

1. Better implementation of flood mitigation measures like embankments by the government.

2. Relocation of the settlement by the government to a higher, well planned, non-flood prone ground to prevent the displacement caused by floods and its attendant health effects on this population.
3. Periodic re-evaluation of the social amenities in a community after flooding to identify those destroyed by the flood with a view to restore it. These are important determinants that affect the health of a population.
4. More efforts should be made to supply emergency medications and healthcare to communities post-flood.
5. The PHCs should carry out more awareness campaigns of its purpose and activities, to attract more clientele within the community.
6. Universal health coverage efforts should be strengthened to ensure better coverage for at least basic health care and prevent out-of-pocket health expenditure and its disastrous effects.

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