Disasters and Hospital Safety in Nigeria

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ABSTRACT
Nigeria has suffered from both natural and man-made disasters such as flooding, drought, civil unrest, genocide and insurgency; and the country is very important in the continent in terms of its population size, weak health systems and poor disaster preparedness. During disasters, hospitals play critical role by providing essential medical care to the injured in the communities. This paper assessed the relationship between disasters and hospital safety in Nigeria. The study is a narrative review using secondary literature from PubMed, Medline and Google scholar databases. The search words were disaster, Africa, Nigeria and hospital safety. Hospital Safety Index (HSI) is a global diagnostic tool that provides a snapshot of the probability of functionality of a hospital during disasters. It has structural, non-structural and functional factors in addition to environment and the health services network dimensions with 145 items that can be assessed and grouped into three safety categories- high (A), average (B) and low (C). Category A with score of 0.00-1.0, requires preventive measures to maintain and improve safety; category B with score of 0.36-0.65 measures are required in the short time to reduce losses; category C with score of ≤0.35 requires urgent measures to protect lives. Nigeria over the years has experienced flooding, epidemic, insurgency, fire outbreaks and gas explosion among others with serious impacts. The flood of 2012 alone caused 363 deaths, 2.1 million displaced persons, 18,282 injured and damages of $16.9 billion. The challenges include large gap between policy and implementation, poor knowledge and education on HSI, lack of hazards vulnerability and capacity assessment, hospital building code issues, corruption and poor post-disaster analyses. It is a wakeup call for synergistic action by the relevant stakeholders to reduce risk, protect health facilities and save lives in Africa in general and Nigeria in particular.

Keywords: Africa; Disasters; Hospital safety; Nigeria**.**

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INTRODUCTION
Africa has made remarkable strides, with annual growth averaging 4.5 percent over the last 20 years, foreign direct investment increase of seven-fold, life expectancy increased by six years and school enrollment rise to 74 percent. Infant and maternal mortality rates have decreased by 26 and 22 percent respectively in the last decade [1]. However, the positive development gains are threatened by climate and disaster risks that impact 10 million people on average every year in Africa since 1970 [1]. A vicious cycle of poverty and ill health is the reality for many African countries. Almost half of the population of Sub-Saharan Africa (SSA) live on less than one dollar a day [2]. The continent shoulders a disproportionate burden of the world's communicable diseases, including the highest number of people living with HIV (22.5 million in SSA) and the highest rates of HIV-TB co-infection [2]. The main communicable disease causes of morbidity and mortality are diarrhoeal diseases, acute respiratory infections, measles and vector-borne diseases (dengue, yellow fever, Crimean–Congo haemorrhagic fever and typhus) [3]. Africa is the home of 60 per cent of the world's malaria-sufferers and witnesses 90 per cent of the world's malaria deaths [2]. Malaria is endemic in over 80% of areas affected by natural disasters [3].

Disasters cause severe impact on social and economic development in many African countries, and the burden falls disproportionately on vulnerable populations, namely the poor, ethnic minorities, old people and people with disabilities [1,4]. Various risk factors for human vulnerability to disaster-related morbidity and mortality include low income, low socioeconomic status, lack of home ownership, single-parent family, older than 65 years, younger than 5 years, female sex, chronic illness, disability, social isolation or exclusion [4,5].

Africa has had both natural and man-made disasters, with serious consequences. The Natural disasters in the continent are predominantly hydro-meteorological and climatological. Epidemics such as Lassa fever, Ebola virus disease, plague, measles, meningitis, dengue and COVID-19, also comprise a large proportion of disasters in the region [1,6]. Many parts of the continent are prone to flooding. For example, heavy rains in Congo and Northern Angola increasingly lead to massive flooding in the areas banking the Zambezi River. This was illustrated by the mega floods of 2000 and 2001 in Mozambique, which drew the world's attention through television images of a woman giving birth in a tree [2]. Such floods not only drown people, livestock and homes, but also lead to a great upsurge of waterborne diseases, such as cholera, shigellosis, typhoid fever, among others [3]. Leptospirosis is associated with flooding and the increased proximity of rats to humans [7,8].

Economic Community of West African States (ECOWAS) policy recognises that over 75 per cent of the population of West Africa live in areas that are regularly affected by natural hazards such as floods, droughts, cyclones or earthquakes. It also recognises that the level of vulnerability determines whether these hazards will become disasters [2].

Nigeria is an important country in the Africa continent and it has been suffering from natural disasters such as flooding and man-made disasters such as insurgency and ethno-religious crises, among others. Hospitals have been destroyed and health workers targeted in some cases, compounding the health challenges, especially in a country where the health system is weak and human resources for health is poor. This bad pre-disaster situation is usually worsened when disasters occur. These include high social and financial costs with the associated human tragedy. Human vulnerability has been shown to be responsible for the increased catastrophic effects of disasters [9]. This paper assesses the situation of disasters and hospital safety in Nigeria in particular.

DISASTERS, DISASTER SEVERITY INDEX AND HOSPITAL SAFETY
A disaster is defined as a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceed the ability of the affected community or society to cope using its own resources [10]. Disaster impacts may include loss of life, injury, disease but also other negative effects on human physical, mental and social well-being, together with damage to property, destruction of assets, loss of services, social and economic disruption and environmental degradation [10]. Disasters are often classified according to their speed of onset (sudden or slow), their cause (natural or man-made), or their scale (major or minor).

Disasters may cause ill-health directly or through the disruption of health systems, facilities and services, leaving many without access to health care in times of emergency. They also affect basic infrastructure such as water supplies and safe shelter which are essential for health [4]. The public health impacts of disasters are many and cannot be over-emphasised. Disaster severity index (DSI) is used to quantify the impact of disasters and it is calculated as number of persons

killed plus the number affected divide by the total population multiply by 100.

During times of disaster, hospitals play an integral role within the health-care system by providing essential medical care to their communities [11]. To enhance the readiness of health facilities to cope with the challenges of a disaster, hospitals need to be prepared to initiate fundamental priority action [11]. The role of the hospital in maintenance and promotion of public health is more important in times of crisis because the hospitals also act as public shelters and a ray of hope for the affected population in the crisis [12].

Hospitals are complex and potentially vulnerable institutions, dependent on external support and supply lines. During a disaster, an interruption of standard communications, external support services, or supply delivery can disrupt essential hospital operations and even a modest unanticipated rise in admission volume can overwhelm a hospital beyond its functional reserve. However, resilient health systems based on primary health care at community level can reduce underlying vulnerability, protect health facilities and services, and scale-up the response to meet the wide-ranging health needs in disasters [4].

WHY SAFE HOSPITALS SHOULD BE PRIORITY?
Health facilities, especially hospitals, are critical assets for communities on day-to-day basis and when disaster strikes. Yet they and health workers are often among the major casualties of emergencies, with the result that health services cannot be provided to affected communities when they are most needed [13].

Studies showed that during accidents and disasters, the need for medical attention is highest in the first 24 to 48 hours and 85 to 95 percent of survivors are those that were rescued and received effective medical aid in the first 24 hours [14].

Acts of violence, including direct attacks, have increased the threats to the security of hospitals, health workers, patients and health services [13]. Measures to ensure the safety, security and functionality of health infrastructure are needed at both national and community levels. Hospitals are also important symbols of social well-being. A Safe Hospital programme is an essential component of a country's strategy for disaster risk reduction and, in particular, emergency and disaster risk management for health [13] and resilient hospitals will be able to provide essential services to affected people and it can mitigate the risk of injuries during and after disasters [15].

World Health Organisation (WHO) and partners have been promoting safe hospital programmes for over 20 years through global, regional and national policy commitments, technical guidance and support to countries and partner organizations in WHO's six regions [2]. Recent developments that are aligned with Safe Hospitals have included a greater focus on security measures to protect health workers and facilities in areas of conflict, violence and criminality, and initiatives to improve the energy efficiency and waste management practices of ''green'' or ''smart'' hospitals [13].

The Hyogo Framework for Action 2005-2015 makes specific reference to "promoting the goal of 'hospitals safe from disaster' by ensuring that all new hospitals are built with a level of resilience that strengthens their capacity to remain functional in disaster situations and implement mitigation measures to reinforce existing health facilities, particularly those providing primary health care". The World Health Assembly and WHO Regional Committees have passed resolutions with member states pledging to make their hospitals safer.

HOSPITAL SAFETY INDEX
A hospital safety index (HSI) is a rapid, reliable and low-cost diagnostic tool that provides a snapshot of the probability that a hospital or health facility will continue to function in emergency situation. It takes into account structural, non-structural and functional factors in addition to environment and the health services network. It is easy to apply by a trained team of engineers, architects, builders and health professionals, and it has allowed safety to be gradually improved upon. It is an important first step towards prioritizing a country's investment in improving safety. It protects the lives of all occupants, the investment in the infrastructures and the functionality of new facilities and those identified as priority facilities in the health service network. 145 items or areas are assessed and then subsequently categorized into one of the three safety categories- high (A), average (B) and low (C). Category A with score of 0.00-1.0, requires preventive measures to maintain and improve safety, while category B with score of 0.36-0.65 measures are required in the short time to reduce losses. Category C with score of ≤0.35 requires urgent measures to protect life of patients, visitors and hospital staff [13].

The Hospital Safety Index not only estimates the operational capacity of a hospital during and after an emergency, but it provides ranges that help authorities determine which facilities most urgently need interventions [12]. The failure of non-

structural elements does not usually put the stability of a building at risk, but it can endanger people and the contents of a building [12].

Health systems are composed of public, private and nongovernmental facilities which work together to serve the community; these include hospitals, primary health care centres, laboratories, pharmacies and blood banks. Safe hospitals programmes ensure health facilities are safely built to withstand hazards, remaining operational in emergencies [4].

THE NIGERIA SITUATION

Nigeria had experienced various degrees of disasters over the years of which flooding and epidemic are the natural ones. Others such as road traffic accidents, oil spillage fire outbreaks and terrorism are man-made and are avoidable. In most cases, whether natural or artificial, Nigeria has always been caught unawares because there had not been any efficient disaster management system in place and as such each time disaster strikes, it usually results in significant human and animal lives and economic losses to the country. Flooding which is a recurring disaster in Nigeria is usually caused by either climatic or non-climatic factors, thus leading to river, flash, urban and coastal floods among others [16]. In the history of flooding in Nigeria, the worst experience was recorded between July and October 2012 when 363 people lost their lives, 2.1 million people across ten states were displaced and 18, 282 were injured [17]. In 2012, floods in Nigeria caused combined damages and losses of $16.9 billion, or 1.4 percent of GDP [17]. Armed banditry, terrorism and ethno-religious crises have also resulted in loss of lives and properties including houses, hospitals and clinics in Nigeria.

The issue of hospital safety is a global phenomenon but unfortunately, there are lots of challenges in Nigeria. These include the large gap between policy commitment and implementation, lack of detailed vulnerability and capacity assessment in hospital setups, development and revision of building codes for hospitals in relation to emerging disasters, lack of continuous training and re-training of health workers in response to disasters, lack of evaluation and learning lessons from past disasters. Others include, assessing the safety of existing health facilities, development of national policy and programmes on hospital safety, developing partnership between health facilities and the communities, poor reduction of vulnerability of persons and individuals to disaster as a public health priority e.g. through poverty reduction, non-inclusion of conflict resolution mechanisms and peace education in school curricula and lack of application of multidisciplinary approach in hospital safety, among others[18].

According to the World Health Organization-Western Pacific Region, the African Region has the lowest density of physicians, nursing and midwifery staff, and pharmaceutical personnel [13]. This means that the impact of disasters in Nigeria will be catastrophic since these are the personnel that treat the injured, maintain environmental sanitation, and provide preventive, protective and promotive health services. Nigeria being the most populous black nation on earth with some fragile demographic, socio-economic and health indices will also have negative consequences in an event of a disaster[19]. There have been documentations that when health services and hospitals fail due to disaster (from structural or functional reasons), people die and suffer needlessly both during the disaster and long into the future [20]. Health sector damage can cause devastating secondary disasters.

Hospitals are safe from disasters when health services are accessible and functioning, at maximum capacity, immediately after a disaster or an emergency. Safe hospitals will protect the lives of patients and health workers, make health facilities and health services function in the aftermath of emergencies and disasters (when they are most needed) and improve the risk reduction capacity of health workers and institutions, including emergency management [20]. As such, every Nigerian should be made aware of the importance of the issue and be committed to helping ensure that hospitals and health facilities are resistant to natural hazards [20]. Hospitals are the setting in which health workers work tirelessly to ensure the highest level of service; and home to critical health services such as public health laboratories, blood banks, rehabilitation facilities or pharmacies [20]. Hospitals and health facilities represent an enormous investment for any country and their destruction imposes major economic burden and its consequences.

CONCLUSION

The relationship between disasters and hospital safety is very important in Africa in general and Nigeria in particular as natural and man-made disasters continue to cause deaths of humans and destruction of hospital structures and equipment, among others. The structural and non-structural requirements should be taken seriously by government in terms of policy, practice and development both at African regional level and

national level in order to reduce the losses and disruption of services during disasters.

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