ISSN No: 2276-6839

SAVANNAH JOURNAL OF MEDICAL RESEARCH AND PRACTICE

Volume 1, Number 2 July - December, 2012

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A Publication of Nigerian Medical Association



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A Publication of The Nigerian Medical Association

Volume 1
Number 2

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MEDICAL RESEARCH AND PRACTICE
An Official Publication of the Nigerian Medical Association

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Savannah Journal of Medical Research and Practice 2012;1(2):7-17

ORIGINAL ARTICLE

Disasters in Nigeria: the increasing epidemic and the role of a disaster medical specialist

Saka MJ *[2], Osagbemi GK *[1], Saka AO **, Yusuf F *[3]

Abstract

Background: A disaster is any event, natural or man-made, sudden or progressive which impacts in such a magnitude that the affected individual, community or nation has to respond by taking exceptional measures.

Objectives: This article discussed disasters in Nigeria, role of a physician in its management and the need for the establishment of disaster medical specialist.

Methods: It was a rapid study using both primary and secondary data obtained from ministries, departments and agencies.

Results: Between 1983 to 2010, Nigeria experienced over 119 devastating disasters, while 25 series of bomb blasts occurred between September 2010 and January 2012. Over 6.5 million people across the country were badly affected and treated as mass casualties in Nigeria hospitals. Even though physicians often play an integral role in the disaster management, few participated fully in all the stages of disaster management cycle.

Conclusion: Nigeria has been witnessing series of common episodic disaster events. Some are caused naturally, while some are human induced. This has produced a lot of negative socio-economic impact. It is recommended that hospital disaster management team should be put in place while the long term specialization in disaster medicine should be recognized in Nigeria.

Key worlds: Disaster, Physicians Role, Disaster Medical Specialist, Disaster team in Hospital

Introduction

Disaster is defined as the occurrence of an abnormal or infrequent hazard that affects vulnerable communities or geographic areas.[1]

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It causes substantial damage, disruption and casualties and leaves the affected communities unable to function normally.[2, 3, 4] Disaster is believed to be a sting of nature or repercussion of man-made actions, causing losses of both natural and man-made resources in affected areas.[5-8]

There are two types of disasters, one is caused by human action (artificial disaster) while the other is natural.[5] The former includes famine, flood, earthquake and the action of violent winds. The latter includes fire, deforestation, violence, urban flood, urban sprawl and squatter settlements.[4] Economic disasters implies some combination of loses in financial capital and a reduction in economic activities.[9] A biological` disaster could be interpreted to mean disasters generated against the ecosystem. Sociological disaster deals on civil war, communal or political crisis and conflicts. Geological disasters cover earthquakes and volcanoes.[3] However, in Nigeria and Africa at large, the most common disasters are caused

by man's violent conflicts.[9,10] In whatever form, disaster is considered to be an unprepared shocking event or happening which has bad effects on people and their properties in urban communities which produces a combination of shocks, loss of lives and properties.

In Nigeria, since 1976 events such as frequent oil spills; pipe line vandalisation, increasing levels of urban industrial pollution and waste,[11,12] rise in the number and severity of floods, especially in Anambra, Akwa-Ibom, Ondo, Jigawa, Kano, Sokoto, Kebbi, Zamfara, Gombe, Oyo and Kwara States.[13-18] The rampant air crashes of 1992 to 2009[19], fire disasters especially market infernos in Sokoto and Plateau State etc. Cases of collapsed buildings in Lagos, Abuja and Port-Harcourt from year 2000 till date[20], ethno-religious conflicts[21], threat to oil/gas explorations by Niger Delta militia [22], series of coordinated and non coordinated bomb blast in Abuja, Kano, Maiduguri, Niger, Yobe, Bauchi and some other parts of the country in Nigeria.[23] All of these have provided a perspective on the needs of patients who are children and adults, in Nigeria hospitals, with lots of challenges facing physicians in event of disasters. These disasters have been accompanied by numerous casualties including property damage.

In 2010, the communal conflict in Akampa Local Government Area in Cross River State led to the displacement of about 3,000 people and left 12 dead. The Tiv/ Hausa-Fulani clash in Nasarawa State culminated in the death of 50 persons and displacement of 50,000 people. Furthermore, during the same period the flood disasters in Aba (Abia State), Kirfi (Bauchi State), and Talata-Mafara (Zamfara State) and in Ilorin (Kwara State) led to the dislocation of about 13,000 people although no casualties were recorded. [18,24,36] From records available from National Emergency Management Agency (NEMA), between 1983 to 2011, Nigeria was hit by more than 94 devastating natural disaster (drought and flood), 6,306,441 people were badly affected while 21,002 deaths occurred, these translate to US$ 188,025/1,000 economic damage, with average financial impact of US$ 6,065 per day.[25]

Changes in governmental policy toward disaster medicine and hospital incident of cases foreshadow a significant change in the role that physicians will play in disaster preparedness and response. The distinct discipline of disaster medicine received authoritative recognition and promotion in National Health under the function of Federal Ministry of Health (2011) and also in the Act that established National Emergency Relief Agency (NERA) by Decree 48 of 1976, charged with the task of collecting and distributing relief materials to disaster victims. National Emergency Management Agency (NEMA) was established in March 1999 via Act 12 of 1999 as amended by Act 50.The Agency was saddled with the responsibility of coordinating disaster management activities for the country and establishment of guidelines and institutional frame work for disaster-related decision making.[26,27] This article aimed at improving knowledge of health workers on the different types of disasters, the magnitude, role of physicians in the management of disaster and the need for disaster specialist training in developing countries.

Methodology

This study was conducted in Kwara State, Nigeria. It utilized both primary and secondary data. The primary data were sourced from respondents who are managers, directors, the seniors and juniors staff in disaster related agencies (NEMA, NERA etc), through email generated structured questionnaires and the use of oral telephone interviews where necessary. The secondary data were obtained from Federal and State government, parastatals and agencies. They provided statistics of the occurrence of disasters such as flooding, and collapse of building. Other unpublished project reports, published journals, magazines and books were also accessed.

Disaster Types, Magnitude, Preparedness And Management

A disaster is any event, natural or man-made, sudden or progressive which impacts in such a magnitude that the affected individual, community or nation has to respond by taking exceptional measures outside the affected area. There is usually the need for outside intervention measures because the impacts of the disaster overwhelm the ability of the

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affected community to cope.[28] When countries, regions, localities, communities, families or individuals are affected by disasters, they require international, national and other stakeholders from elsewhere to assist in order to stop the progression, reduce the impacts or prevent the recurrence of the disaster. A disaster is, therefore, a serious disruption of the functioning of a society, causing widespread human, material or environmental losses which exceed the ability of the affected society to cope using its own resources.[29]

Disasters are often classified according to their speed of onset into sudden and slow insidious disasters.[30,31]

Sudden disasters

These are disasters that occur rapidly often without prior warning signs. Sudden disasters include earthquakes, tsunamis, floods, storms, volcanic eruptions, explosions, landslides, massive road traffic crashes, air crashes and boat mishaps.[30]

Slow or insidious disasters

These are disasters that start gradually and proceed to the extent of causing wide spread effects and impacts in the affected areas. Slow onset disasters include droughts, famine, environmental degradation, desertification, deforestation, pest infestation, civil conflicts, armed militancy, insurgency, epidemics, terrorism and radiation from nuclear activities.[31]

Compound disasters

Disasters may also be classified according to their precipitating causes into natural or man-made.[5, 6, 18] It may appear that all disasters fall distinctly into either natural or man-made categories, but there is often an overlap of events leading to disasters. For instance, heavy rainfall may lead to destruction of railroads with a consequent derailment of a train carrying inflammable fuel materials. The derailment can lead to a cascade of events culminating in fire disasters in human dwellings. In shanty communities where refuse is dumped into municipal drainage channels, heavy rainfall can lead to flooding and the effects of the flooding may include physical, biological, chemical and social devastation in homes, communities and the entire locality.[32]

Natural disasters

These are disasters due to activities of nature that are usually not under the control of man. Such natural disasters include hurricanes, cyclones, volcanoes, earthquakes, landslides, sea slides, gully erosions, droughts, famine, disease epidemics and floods.[7, 32] The natural disasters are attributable to the forces of nature without direct link to human actions or inactions. Environmental factors are important in the precipitation of such natural disasters and human manipulation of the environment can alter the physical, biological and chemical equilibrium of the ecosystem thereby resulting in natural disasters.[4]

Man-made disasters

These are disasters due to human activities that directly lead to catastrophic consequences. The principal or direct causes are identifiable to human actions whether deliberate or inadvertent. Man-made disasters include civil disturbances, military conflicts, ethnic unrests, militant in Niger Delta, Boko Haram in Northern Nigeria, other religious crises, political thuggery, armed militancy, fire outbreaks, poverty, bomb explosions, road traffic crashes, air mishaps, sea accidents and collapse of buildings.[6,10,12,19,20,21]

These man-made disasters may be due to negligence by man, differences in political, religious ideologies or perceived injustices. Environmental and social manipulations by man can also lead to man-made disasters which could have dire consequences on the survival and wellbeing of the people within and outside the area where the activities have taken place.[8]

Complex Disasters

Complex disasters are a form of man-made emergencies in which the causes, effects and assistance to the afflicted are influenced by social, economic and environmental factors. They also include disasters influenced by intense levels of political considerations. Examples of complex disasters include problems of displaced people during time of civil conflicts who while in a refugee camp suffer from an outbreak of cholera within the camp, a famine within a region leading to hunger with possibility of civil strife and a flood that forces people to seek refuge across international boundaries where social conflicts ensue between host community members and refugees.[21] Complex disasters may retain their unique effects and characteristics while occurring

Table I. Natural Disaster in Nigeria from 1980 to 2010[25]

Overview of Disaster	Number
Number of events	94
Number of deaths	21,002
Average deaths per year	677
Number of people affected	6,306,441
Average number of people affected per year	230,434
Economic damage (US$ x 1,000)	188,025
Economic damage per year (US$ x 1,000)	6,065

Table II Trend of Plane Crash Disaster from 1973 to 2006[19]

Year	Location	Affected	Death
1973	Kano	198	170
1978	Kano	16	16
1983	Enugu	66	51
1991	Sokoto	52	0
1995	Kaduna	129	9
1996	Lagos	133	133
2002	Lagos	71	70
2005	Lagos	117	117
2005	Port Harcourt	103	101
2006	Abuja	100	93
Overall Total		**985**	**760**

simultaneously. For instance, people caught between contending forces during civil wars, an accompanying drought rendering people to be unable to cultivate food with consequent famine; while they are unable to have access to food and other humanitarian aids due to the ongoing conflict.[10] Also included are people who may not be trapped within combat zones but remain in hard-to-reach areas because of political, logistical and or security obstacles and may be denied access to international humanitarian assistance. The combination of various devastating effects exert great toll on the afflicted people and communities.[9]

Effect of Disaster in Nigeria

The effects of each disaster are many and complex.[1, 2, 3] Considerations are given to the size of the area involved, the extent of damage, and the effects on community resources. The extent of damage includes the physical injuries to persons and damage to property, especially destruction of infrastructure (roadways, bridges, and communication lines).[23,25] The effects on community resources include the absence of electricity, gas, sanitation, and potable water; the necessity for portable shelters; and the potential for recurrence (e.g., earthquakes with aftershocks). There are also biological, psychosocial and economic effects including stigmatization, loss of identity and poverty.[1,3,4]

RESPONSE TO DISASTERS

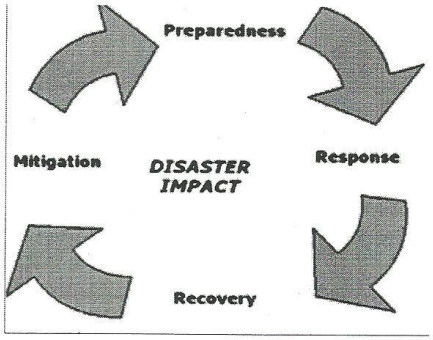
The planning for and response to disasters traditionally have been the responsibilities of Federal, State, and Local governments. The National Emergency Management Agency (NEMA) is involved in declaring disaster and National emergencies, other Federal Departments and Agencies (FDAs) including the Ministries of Transportation, Defense, Housing and Urban Development, and the Federal Aviation Administration. On a regional level, state and local Emergency Management

Authorities (often within the state or local department of health services) have area-wide response plans. These authorities organize emergency operation centers (EOCs), whose duties include; 25

- Damage assessment;
- Allocation, designation, and distribution of casualty collection points;
- Identification, prevention, and elimination of public health hazards;
- Coordination of activities with support departments, agencies, and public utilities;
- Coordination of requests for mutual aid.

THE ROLE OF THE PHYSICIANS

Children and adults who have experienced disaster may suffer a sense of loss (such as home, family, friends, pets, and possessions), sustain physical injury, and develop stress-induced problems. An understanding of children and family dynamics is needed to deal appropriately with disaster situations. Physicians including the medical officer of health can provide the expertise to address the needs and special problems of disaster victims in all the four phases of a disaster as seen below.[33,36]



PLANNING BEFORE A DISASTER

Physicians, community health workers, individual and professional bodies e.g. Association of Public Health Physicians, Institutions such as hospital disaster control units should participate in the development of hospital, community and national disaster plans. Physicians, epidemiologists should provide input into the national, state, hospital and local offices of Emergency Medical Services (EMS) to assure that the needs of adults and children are incorporated into every plan, including contingency plans for meeting the needs of critically ill and injured children. Epidemiologist and other physicians should take part in local community response team planning and help identify the numerous problems that disasters pose based on experiences gained from responses and drills from previous potentially similar disasters.[35] Public health physicians who should serve as the head of the team while others such as the medical officer of health, the Physicians, Pediatricians, the Surgeons(Traumatologist), the public health engineers, the communication experts and the epidemiologists in the community can assist in both triage treatment and care of patients. Important issues which should be addressed include;

- Where should the physicians go during the disaster?
- How should physicians be notified that they are needed to respond to the disaster (disaster trees, check-in)?
- How should hospital physicians be identified and notified and mobilized to the scene to attend to victims of disaster?
- How should transfers of patients to the hospital, management and discharges be handled?

In addition, alternatives need to be considered in the event of a loss of power and conventional telephone use are backup systems such as cellular phones, direct telephone lines that are not part of the regular telephone system, two-way radios, beepers, and ham radios. In areas where physicians cover several hospitals, they should initiate processes through the country medical association or society to provide uniform coverage of hospitals in the area.[34,35,36]

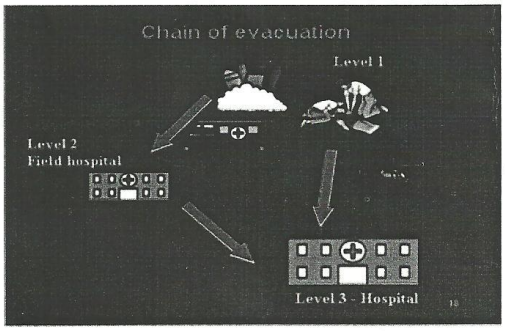
ACTION DURING A DISASTER

In the events of a disaster, offices or clinics may become sites for care, if area hospitals are unable to provide services. Recent experiences have demonstrated that health care may be administered in parking lots, malls, and tents using limited power and water sources.[36] Physicians should prepare, regularly update, and practice an office disaster plan addressing response and recovery issues. Office training programs in emergency procedures, including

first aid, cardiopulmonary resuscitation, evacuation, search and rescue, the use of fire extinguishers, and participation in community disaster drills, should routinely occur as part of the office's overall emergency preparedness. It is advisable for physicians to consult local building codes to ensure that their office buildings and hospital premises meet current structural safety standards. It is important to assemble emergency kits with water, first aid supplies, radios, flashlights, batteries, heavy-duty gloves, food, and sanitation supplies. As the threat of natural disasters is ongoing, an anticipatory guidance on disaster preparedness can be provided with the physician's input.[33]

Family and household preparedness measures include;[36]

- training in cardiopulmonary resuscitation,
- escape routes,
- lists of emergency telephone numbers, and friends or relatives that family members can contact after an unforeseen event to report their whereabouts and conditions.
- storm shutters or bomb blast or earthquake proofing could be considered.
- parents should maintain emergency supplies of food, water; medicine, a first aid kit, and clothing.
- family members should know the safest place in the home, make special provisions,
- knowledge of community resources and plans to reunite such plan,
- medications for chronic illness and resources for technically dependent children should be included in the action plan.



The physicians' role during a disaster will be predicated by the disaster plan; hence familiarity with the plan is paramount. Once the disaster is recognized, institute office and home disaster plans and participate in the community or hospital predesigned plan, as on the scene, hospital, or clinic resource persons. Physicians are involved in disaster triage, direct patient care, patient discharge/transfer, facilitation and reception of patients at other sites including offices, and hospital evacuations. Trauma, especially involving wounds, are usually the most common diagnosis, with an increased need in physician.[37]

HELPING DURING THE AFTERMATH

The length of the recovery period depends on the nature of the disaster. Physicians should be prepared to deal with continued disruptions of services that will affect their ability to care for patients and have plans to provide on-site emergency and primary health care at emergency shelters and refugee camps. Issues to be addressed include;[38]

- inpatient and outpatient treatment,
- infectious disease control,
- alternatives for lost services/utilities,
- environmental sanitation of the refugee camps or shelter camps
- logistics and resupply,
- physical, mental and socio economic rehabilitation,
- assisting families to cope with the emotional toll of the disaster may be an ongoing responsibility of the physician and
- helping family to relocate and reunite family members

Also important is critical incident stress debriefing. Protocols for critical incident stress debriefing have been developed to help victims and health care providers cope with the emotional toll of disasters. During the aftermath, changes in practice location, a lack of refrigeration for medications and vaccines, usually continues. Disruption of communications, power outages, and lack of sanitation will force changes in practice standards and require inventiveness and flexibility.

THE NEED FOR DISASTER MEDICAL

SPECIALIST TRAINING IN DEVELOPING COUNTRIES

In most developing countries including Nigeria, hospitals or medical and dental council (MDCN) should recognize the need to develop disaster medicine as a separate medical discipline that will have a vital national role in preparedness planning and disaster response. By default, current disaster planning and hospital response are primarily the responsibility of hospital administration, but as physicians become better trained in disaster medicine, and as certification of that training becomes more established, the physicians' involvement and responsibility in hospital disaster management will increase.

Typically, hospital administrations tend to look to their medical staff, such as the chief consultant, physician or chief consultant surgeon and the medical officer for medical or technical input. However, most of these health experts do not have broad range of expertise and competencies necessary for effective all-hazards disaster planning and response. The input from the medical/technical specialist in disaster can arise from one or more individuals, as deemed appropriate. While there are many suggestions as to the technical skills and knowledge base required for personnel to fill this role, there remains an absence of well-defined role models for a standard medical/technical specialist in disaster. The technical considerations include[39]

- biological , chemical and radiological weapons
- triage and clinical medicine
- Managerial and administrative skill
- legal affairs
- logistics and supplies
- security, and critical infrastructure

Suggested potential candidates to serve as members of medical/technical specialist(s) teams include;[40,41]

- Public health physician
- Industrial hygienist
- Infectious disease specialist
- Epidemiologist
- Pediatricians
- Radiation safety officer
- Structural engineer, outpatient services administrator
- Chief of trauma
- Primary care director
- Behavioral health director
- Legal services director
- Poison control director
- Information technology–information systems director.

GENERAL TRAINING REQUIREMENT FOR DISASTER MEDICAL SPECIALIST

Most, if not all, of the disaster-related functions included in these disciplines should be encompassed in the range of capabilities of a physician appropriately trained in disaster medicine. The disaster medicine physician provides a one-stop shop in the hospital's incident command center for technical input and judgment advice that can be readily accessed during rapidly evolving disasters that require integrated judgment made across many parameters. This does not preclude coordinated consultation with issue-specific subject matter experts by the incident commander, but rather enables the more appropriate utilization of such specialty experts.

As disaster medicine physicians become assimilated into the health systems at the hospitals structure level, they must be qualified, accessible, and integrated into general hospital functions. While such physicians optimally should be clinically active members of the hospital medical staff as their primary medical specialty would dictate, they should also have specific training and experience in disaster medical issues beyond their primary specialty training.

GENERAL TRAINING REQUIREMENT

The medical specialist in disaster needs to possess additional knowledge external to traditional medical sciences to be comfortable with and competent in making disaster-related decisions. The training and experience include areas such as mass-casualty care and planning

for all-hazards and weapons of mass destruction response, as well as working knowledge of the National Incident Management System and incident command structure, personal protective equipment and decontamination, critical infrastructure, and administrative concerns (including knowledge of how external factors and events may change these concerns), and legal and ethical issues. They also require critical decision-making skills. Disaster medicine physicians should likewise be able to demonstrate an ability to be proactive and anticipate future needs, which can provide the incident commander with an opportunity to get ahead of the situation before it deteriorates completely.[42,43]

Specific disaster medicine training can be obtained in a number of courses, such as those developed by the American Medical Association Center for Disaster Preparedness and Emergency Response, which include Basic Disaster Life Support and Advanced Disaster Life Support, offered throughout the nation by educational agencies and sponsored by the National Disaster Life Support Foundation. Other courses are offered through the Federal Emergency Management Agency's online Emergency Management Institute Courses format. Online courses are organized into major headings, including the Healthcare Leadership Course, which presents technically correct scenario-based disaster exercises, the Incident Command System/Unified Command System and National Incident Management System modules, and the Professional Development Service, offering courses in principles of disaster management, decision making and problem solving, and leadership and influence.[44]

Much disaster medicine training and experience can be achieved through real-world participation in disaster response, such as Disaster Medical Assistance Team training and deployment, or through involvement with emergency medical services or emergency department responses. One obvious expectation, however, is that a hospital's designated medical/technical specialist(s) should be expected to have undergone significant training in disaster medical response that would include both natural and man-made disasters, especially disasters caused by weapons of mass destruction. Such training would also be expected to address response organizational planning, psychosocial issues, and critical infrastructure. Such individuals should also have practical preparation for dealing with hazardous materials and all-hazards contamination, while having practical preparation in disaster planning and drill activities.[45,46]

Given the fact that disasters may affect resources and infrastructure outside of the hospital, the medical/technical specialist disaster must take cognizant of the availability of logistical supplies and additional personnel resources. This will require in-depth knowledge of local public health protocols, national, zonal disaster plans, the availability of other hospitals in the zones to receive patients in transfer, and where medical staff may be available to assist with care at the home facility. The understanding of the role of state and federal assets and how to obtain them is equally important. The medical/technical specialist must take cognizant of the role of law enforcement and other federal agencies in the event of man-made disasters.

While much of this knowledge might be obtained from disaster medicine literature and distant learning modalities, a significant need exists for practical experience and training for those functioning in the role of medical/technical specialist. Through these non-traditional learning experiences, the medical/technical specialist will inherently develop personal contacts in other response groups—contacts who can serve as subject matter experts. These experts can provide valuable insight into their individual group's perspective and abilities, allowing the medical/technical specialist to better anticipate needs and utilize the group's skill set for new and unconventional approaches. The medical/technical specialist should be included in all decision-making involving the hospital's response to local emergencies and planning sessions with area disaster leaders. Integrating medical/technical specialists into the planning gives them the opportunity to meet other response personnel in a low-stress environment, allowing the entire incident command team to develop familiarity and trust. This rapport will minimize the time spent at the

beginning of an event trying to learn who the players are and will enable those involved to focus on the task at hand. Involvement in planning also allows the medical/technical specialist(s) to apply their knowledge of local medical capabilities, available assets, and critical decision points during the response to an event in an attempt to ascertain shortfalls in the response plan and address those needs in advance—a skill that may not be readily available in administrative personnel.

Conclusion

Nigeria has been witnessing series of common episodic disaster events. Some are caused naturally while some are human induced which are coordinated and non coordinated events. Attempt was made in this article to discuss different types of disaster, the magnitude of selected disaster (fire outbreak, violent wind or storm, flooding and collapse of building and disease outbreak or epidemic), the role of physicians in disaster management and the need for Disaster Medical Specialist in Nigeria. The result revealed that a number of factors caused the occurrence of this common episodic disasters events, some are proximate and some are non proximate. The end result of disaster event is the effect it has on people's lives and their properties, which are at times potent and at times subtle. It was found out that even after the disaster events have happened, the woes of their deeds are still felt. Generally, these disasters produce a lot of negative socio-economic impact. It is therefore important that people should be educated on how to use their environment and welfare facilities like electricity points at homes. Control the degree of environmental abuse and misuse by controlling illegal constructions or growth of land use, disposal of refuse waste in drainages and the use of wood fuel or charcoal for room heating. It is recommended that hospital disaster management team be in place while the long the specialization in disaster medicine be recognize in Nigeria.

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