UNIT 2 DISASTER HEALTH CARE MANAGEMENT

Structure

2.0 OBJECTIVES

An overview of disaster health care management in India is the focus of this unit. The thrust is on making the learner understand the disaster specific health effects of various disasters, different aspects and the institutional mechanism available in India to provide quick and effective services to the affected population. At the end of this unit you should be able to:

- give a bird's eye view of overall disaster health care management in India;
- distinguish between disaster specific health effects, and between the direct and indirect effects of disasters on health;
- differentiate between public health and mass casualty components of disaster health care management;
- explain the importance of disaster psycho-social and mental health care for the health service professionals.
- state the institutional mechanism followed in India to deal with health disasters and health effects of other disasters; and
- mention few important guidelines as provided in national guidelines on medical preparedness and mass casualty management.

2.1 INTRODUCTION

India is vulnerable to disasters caused by natural hazards on account of its unique geo-climatic conditions and by man-made disasters on account of its socio-political and cultural conditions. Floods, droughts, cyclones, earthquakes and landslides have been recurrent phenomena. About 60% of the landmass is prone to earthquakes of various intensities; over 40 million hectares is prone to floods; about 8% of the total area is prone to cyclones and 68% of the area is susceptible to drought. We

are also highly susceptible to man-made disasters because of lack of enforcement of various legal provisions like fire safety and traffic regulations etc. as these are not being followed by the community. We have in the decade 1991 - 2000 lost 43,440 lives and 300 million people affected due to disasters. We had super cyclone in Orissa in October, 1999, Bhuj earthquake in January 2001 and Tsunami in December 2004. The Bhuj earthquake had 13,800 deaths and 1,67,000 injuries, while other two disasters also had about 10,000 deaths in each case. Earthquake in Jammu and Kashmir in 2005 also resulted in huge number of death and disability.

The list of man-made disasters includes rail, road and air accidents; bomb blasts; fire incidents; terrorism; communal riots; industrial disasters; etc. The worst man-made disaster of India has been methyl isocyanides (MIC) Gas Leak in Bhopal. Accidental trauma is one of the leading causes of mortality and morbidity in India. Every 12 minutes one Indian dies on the road and 10 times that number are injured. Among them 30% are disabled for life either partially or totally. World Health Organization (WHO) has projected that by the year 2020, Road traffic accidents in India would be a major killer accounting to 5,46,000 deaths and 1,53,14,000 disability. A series of bomb blasts in last few years adds to India's agony of disaster management.

India has witnessed a number of horrifying natural as well as man-made disasters in last two decades. Each one of them resulted in enormous destruction, death, disability, diseases, panic, and fear among the population at risk. However, health problems arising out of the disasters may vary in types and degrees depending upon particular type of a disaster, which would be discussed in detail in next few pages.

2.2 HEALTH SERVICES IN DISASTERS

Health is one of the key objectives and a significant yardstick of success of effective disaster management during this stage. Health care is a critical determinant for survival in the initial stages of a disaster. Disasters almost always have significant impacts on the entire health sector. When it comes to disaster mitigation, preparedness and response, hospitals and health care professionals require special attention due to the vital functions they perform, their high level of occupancy and role they play during a disaster situation. The health impacts could be direct or indirect in terms of public health issues or mass casualty management, which would be explained in next few pages. The impacts could be direct on the health sector infrastructure such destruction or damage to the hospital building, loss of or injury to the health personnel, destruction or damage to the other infrastructure within the hospital building, pressure on the existing resource while dealing with a large number of sudden influx of patients etc. During a disaster, when the urgent survival needs including urgent medical care are met and mortality rates have been declined by immediate mass causality management, a more comprehensive range of services are needed to be provided. Throughout all phases of a disaster, a systematic approach is needed to be developed to design, implement, monitor and evaluate these comprehensive services, which should ensure that most health needs are met with appropriate coverage, optimized access, and quality services.

2.3 PUBLIC HEALTH ISSUES

For one reason or the other, disasters have been contributing to the outbreak of some specific epidemic diseases as the disease transmission risk factors increase when a disaster hits a particular geographic area. Lack of clean water and the suspension of public health programmes, all help illnesses, such as cholera or dengue or malaria to multiply after natural disasters. Often these illnesses can be

more deadly than the original disaster. Rapid changes in the human environment and health may occur also as a result of natural disasters or acts of war or of other man-made circumstances including major industrial accident. However, health problems arising out of the disasters may vary in types and degrees depending upon particular type of a disaster.

Types of disasters & proneness to different epidemics

The increased man-vector contact in precarious shelters and temporary camps and the disruption of control activities may be more important causes for epidemics after disasters caused by natural hazards, in particular. More importantly, disasters caused by natural hazards (hurricanes, floods, earthquakes, cyclones and volcanic eruptions) can contribute to the transmission of some diseases provided the causative agent is already in the environment. Although major health epidemics are rare in the aftermath of these disasters, but some disasters are so great that large numbers of the population are displaced, creating perfect conditions for the spread of disease.

While earthquakes, avalanches, and landslides may result in enteric epidemics due to improper water supply and sanitation; volcanic eruption can lead to respiratory epidemic; and unprecedented amounts of rain leading to disastrous flooding flood and flash floods, and cyclone can result in pneumonia as well as other waterborne/ communicable diseases. In the period immediately following a hurricane, the risk of acquiring malaria, dengue or encephalitis may decrease as a result of the destruction of breeding places of the local vectors. Similarly, industrial accidents can cause respiratory problems. Viral agents during the time of nuclear, biological and chemical warfare can cause diseases like, anthrax, vibrio cholera, and plague requiring immediate treatment.

However, it is important to remember that epidemics do not spontaneously occur after a natural disaster. The more likely cause of disease is the lack of potable water and adequate sanitation. In country like India where cholera is prevalent, general assumption is that disease will spread after any disaster affecting water supply, food quality and sanitation. However, the health problems in natural as well as man-made disasters could be due to either or any combination of factors enumerated below:

- Directly due to impact of disasters like drowning during floods, multiple injuries during earthquakes, thermal blast and radiation effects during and after nuclear disaster and large number of injuries after civil unrest.
- Due to non or inadequate availability of immediate medical care.
- Due to delay in evacuation and transportation to advanced medical centers.
- Due to mass shelter, water shortage and contamination, unhygienic living conditions leading to outbreaks of communicable diseases and resulting in epidemics, another health disaster.

The main causes of disease

Population movement, poor sanitation, water contamination and the interruption of public health programmes are the main reasons for the spread of disease after natural and humanitarian disasters. Often displaced populations are forced to gather in confined spaces, further enabling the spread of epidemics, such as cholera, malaria and dengue fever. In Central America, which was hit by Hurricane Mitch in 1998, cholera was already epidemic. Another problem is the number of injured people who need to be treated. According to the World Health Organization, the presence of dead bodies is not a major factor in the spread of communicable diseases.

Cholera

The spread of cholera is one of the main dangers following a natural disaster. Cholera is an acute infection of the gut, which causes chronic diarrhoea and vomiting. This can lead to severe dehydration and, in some extreme cases, death. However, most people who are infected by the bug do not become ill and 90% of those who do are only mildly or moderately ill. Cholera is spread by contaminated water and food. Sudden outbreaks, such as those, which follow a disaster, are usually caused by a contaminated water supply. The bug is most deadly when it arrives unexpectedly - as in times of disaster - because there are often no facilities for treatment or because people cannot get treatment in time. In communities, which are unprepared for a cholera outbreak, up to 50% of people who become seriously ill may die. Cholera can be effectively treated with oral rehydration salts and antibiotics. Containing a cholera outbreak involves ensuring there are proper sanitation methods for disposing of sewage, an adequate drinking water supply and good food hygiene. Food should be cooked thoroughly and should not be contaminated by contact with raw foods, flies or dirty surfaces. The only cholera vaccine that is widely available is less than 50% effective and only lasts up to six months. There are two other vaccines that protect against one strain of cholera for a short period.

Flood

Flooding is the most common type of natural disaster worldwide, accounting for an estimated 40% of all natural disasters. In ***riverine flooding***, water levels can rise to flood stage gradually or very rapidly (i.e., flash flood) from snow melt or heavy or repeated rains. During the 1993 mid-western flood disaster, both ***gradual*** and ***flash flooding*** occurred.

Flash flooding is the leading cause of weather-related mortality in the United States (accounting for approximately 200 deaths per year). However, the public health impact of floods also includes damage or destruction to homes and displacement of the occupants that may, in turn, facilitate the spread of some infectious diseases because of crowded living conditions and compromised personal hygiene (i.e., hand washing). Stress-related mental health or substance-abuse problems may be associated with flood disasters. As the findings in this report indicate, medical and public health services may be interrupted in affected communities. Finally, the occurrence of injuries may increase during the clean-up phase of a disaster.

The multiple environmental consequences of flooding can directly affect the public's health. For example, water sources can become contaminated with faecal material or toxic chemicals, water or sewer systems can be disrupted, dangerous substances can be released (e.g., propane from damaged storage tanks), and solid-waste collection and disposal can be disrupted. In addition, flooding can result in vector-associated problems, including increases in mosquito populations that, under certain circumstances, increase the risk for some mosquitoborne infectious diseases (e.g., viral encephalitis).

Floods and other natural disasters often are followed by rumors of epidemics (e.g., typhoid, cholera, or rabies) or unusual conditions such as increased snake or dog bites. Such unsubstantiated reports can gain public credibility when printed in newspapers or reported on television or radio as facts. The potential for such rumors underscores the need for valid and systematically collected data and the importance of basic public health surveillance in such settings. Elements to be considered in such surveillance efforts are described in the CDC publication ***Beyond the Flood: A Prevention Guide for Personal Health and Safety***, which emphasizes the importance of 1) purification of drinking and cooking water; 2) disinfection of wells; 3) food safety (i.e., handling of food that may have come in contact with

flood water or of refrigerated food after the interruption of electrical power); 4) sanitation and personal hygiene; 5) injury-prevention measures to be taken during the return to and cleaning up of flooded homes; 6) communicable diseases and vaccinations; 7) mosquito control; and 8) other hazards such as animals, chemicals, and swift-flowing water. Copies of the guide are available from state health departments.

Disasters can contribute to the transmission of some diseases triggering an epidemic in three ways:

- By increasing transmission of local pathogens
- By changing the susceptibility of the population
- By introducing a new pathogen into the environment

The epidemiologic factors that determines the potential of communicable disease transmission is influenced by six types of adverse changes during disasters:

- Changes in pre-existence levels of disease
- Ecological changes as a result of disaster
- Population displacement
- Changes in population density
- Disruption of public utilities
- Interruption of basic public health services

Case study of epidemic followed by natural disasters

Orissa Super Cyclone: The cyclone has claimed many thousands of lives, leaving millions without food or shelter, electricity or water, wrecking the road and rail networks because of embankments giving way, and destroying half of the standing rice paddy crop, the staple food grain. Epidemics stalk millions of cyclone survivors in the eastern Indian state of Orissa, weakened by six days of starvation. Representatives of major Non-Government Organisations (NGOs) which are now coordinating relief efforts said epidemic prevention was as much a priority as the air-dropping of food packets. The cases of cholera and other water-borne diseases were piling up at the hospitals which were crippled by lack of electricity and supplies. A massive sanitation and disinfection drive has been mounted in the district of Cuttack involving the use of bleaching powder and the cremation of carcasses and dead bodies. While no estimate is available on the number of people who perished in the inundation of the coastal areas by a massive six-meter-high tidal wave, Kanchan said the reports showed that in the district of Kendrapara alone, 15,000 people may have died.

During the Orissa super-cyclone in October 1999, WHO provided technical assistance to devise an emergency surveillance system in the 12 cyclone-affected districts to get an early warning of impending disease outbreaks. Training of staff was undertaken and formats for disease surveillance provided for use at district and PHC levels. This helped in averting potential epidemics of fatal diseases. Recognizing this, the disease surveillance programme was extended to the rest of Orissa. Similarly, following the earthquake in Gujarat (India) in January 2001, which destroyed the health infrastructure in many areas, WHO played the lead role in supporting the Government of India and the state government in establishing disease surveillance systems in the affected areas, including development of an early warning system and capacity for rapid response to epidemics. WHO immediately redeployed its medical officers working on the polio and TB programmes in India to support the emergency work. Resources were also provided

for the establishment of an Epidemiological Cell under the district authorities. The rapid surveillance teams worked under WHO guidance and many potential epidemics were averted.

Surat Plague (pneumonic)

The epidemic of plague in Mumbai in September 1896 was so contagious that it turned into a pandemic and continued for two decades in India. It took a toll of eight million people in the country. 1,83,000 persons died in Mumbai city alone and 1,786 in Surat district. Three-fourths of those died were migrants and as many as 80% of death cases and serologically positive cases had a working class background. The latest large, but not major outbreak occurred in Septmber 20, 1994 in Surat, India. Though more than 3000 cases were reported, official figure of deaths was few hundreds.

Its first task in an emergency is to conduct a rapid health assessment in the affected areas within 48 hours of a disaster. Epidemiological Surveillance and disaster illness surveillance and reporting are a must. It is then likely to set up an early epidemic warning system, measures to control communicable diseases, a programme for repairing key hospitals and primary care agencies which may have been hit by the disaster, water and sanitation measures and programmes for ensuring necessary medical supplies are available. Mass immunization and vaccination programmes should be started as soon as possible e.g. to control malaria, measles, mumps, etc. Promotion of greater and more effective community participation in all services related to health.

Prevention of Epidemics

Recent advances in geographical information and mapping technologies have created new opportunities for public health administrators to enhance planning, analysis, monitoring and management of health systems. Health mapping has evolved from Dr. John Snow's cholera Map India 2001 Conference, New Delhi, February 2001 death mapping in mid-nineteenth century to the latest Internet-based mapping where data have been shared across the Internet. Since much of the data used and generated by health and social service agencies has a spatial dimension, geographic information system (GIS) is particularly useful to health professionals and administrators in planning and day-to-day management (Colledge et al., 1996). A typical GIS comprises an organized collection of computer hardware, software, geographic data and personnel, designed to efficiently capture, store, update, analyse and display all forms of geographically referenced information. Each piece of information is related in the system through specific geographical coordinates (e.g. latitude and longitude) to a geographical entity (e.g. health centre, school, dam, drainage, village or state).

The information can be displayed in the form of maps, graphs, charts and tables. GIS provides excellent means for visualizing and analyzing epidemiological data, revealing trends, dependencies and inter-relationships. It can acquire, store, manage, and geographically integrate large amounts of information from different sources, programmes and sectors. GIS serves as a common platform for convergence of multi-disease surveillance activities. Standardized geo-referencing of epidemiological data facilitates structured approaches to data management. Once the basic structure is ready, it is easy to convert it to surveillance system for any other disease. Public health resources, specific diseases and other health events can be mapped in relation to their surrounding environment and existing health and social infrastructures. Such information when mapped together creates a powerful tool for monitoring and management of epidemics. GIS helps generate thematic maps that depict the intensity of a disease or vector. It can create buffer zones around selected features and then combine this information with disease incidence data to determine how many cases fall within the buffer. It can also map

the impact zone of vector breeding site, where control activity needs to be strengthened. GIS can identify catchments areas of health centres and also locate suitable site for a new health facility. It can overlay different pieces of information and carry out specific calculations. GIS allows interactive queries of information contained within the map, table or graph. It permits a dynamic link between databases and maps so that data updates are automatically reflected on the maps. Dynamic maps published on the Internet assist patients in locating the most convenient health services easily. GIS can process aerial/satellite images to allow information like temperature, soil types and land use to be easily integrated, and spatial correlations between potential risk factors and the occurrence of diseases to be determined.

Despite tremendous potential of GIS, the health sector in India has not fully explored it. Majority of the health departments and research organizations in India do not have the hardware, software or trained staff that would enable them to apply GIS technology. However, the interest in GIS has increased during the late 1990s. Many health organizations, such as Malaria Research Centre, DANLEP and Vector Control Research Centre, are exploring its potential utility in medical research and disease control. In this paper, we highlight the role of GIS in monitoring and management of epidemics.

Check Your Progress I

Note: Use the space provided for your answer.

1) What are the main causes of epidemics after natural disasters?

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2) How does GIS help in preventing epidemics?

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2.4 MASS CASUALTY INCIDENTS

Any event resulting in a number of victims large enough to disrupt the normal course of emergency and health care services is called a mass casualty incident. These events present unprecedented challenges as they significantly impact the health care system and other resources. All disasters have an inherent potential to convert into a mass casualty event with increased number of morbidity and mortality. Dimensions of disaster have increased manifold in the light of significant human-made disasters such as terrorists' attacks, bomb blasts, major fire incidents, etc. Mass casualty potential of other emergencies such as chemical/industrial, biological, radiological and nuclear incidents may be enormous in terms of casualties. Medical

management in such situations needs certain specialized facilities like, protection, detection, decontamination, antidote administration and decorporation along with usual care required for other injuries.

Trauma during a mass casualty incident includes bone injuries, head injuries and crush syndrome. Burn injuries due to mass casualty incidents are now a days increasing due to fire incidents, terrorist strikes and accident related disasters. Drowning in flood affected areas and stampede in mass gatherings could also create a situation of mass casualty.

Different Approaches to MCIs

1) ***Basic Approach***

A "scoop and run" method is used most commonly to deal with accident victims. This approach does not require specific technical ability from the rescuers. While this method can be justified for the management of a small number of victims in certain circumstances, this method would not be applicable for overwhelming number of victims due to any macro level natural or man-made disasters.

2) ***Classical Care Approach:***

In this approach, the first responders are trained to provide victims with basic triage and filed care before evacuation to the nearest available receiving health care facility. If the basic coordination between two independently working bodies (first responders and the receiving hospitals) are not prior established and networked, in mass casualty incidents at macro level, this approach can result an extremely chaotic situation to paralyze the total function of the hospital.

3) ***Mass Casualty Management Approach:***

This is the most sophisticated approach with pre-established procedures for resource mobilization, field management and hospital reception. It is based on specific training of various levels of responders and emphasizes on links between field and hospital facilities through a common post. It acknowledges the need of a multi-sectoral response for triage, field stabilization and evacuation to adapted health care facilities. The development of this approach is based on the availability of existing human and material resources. However, this largely depends upon a country's contextual situations of limited or optimum availability of resources. In limited resource conditions, depending on space and care facilities available in a particular health care set up, transport of victims should be staggered wisely.

Actually in a mass casualty incident a small number of victims will need immediate treatment in a hospital, however, to reduce the mortality and morbidity the role of specifically skilled field level teams is very important. The success of a quick and effective mass casualty management depends largely on:

i) ***Good triage capacity of the specifically trained field level teams;***

ii) ***Good radio-communication between field and hospital staff, and;***

iii) ***Good overall coordinated preparedness of the health sector along with other supporting sectors.***

Thus, the concept of triage plays a significant role in the success of the management of victims of a MCI.

Triage

Triage classically means classification or prioritization of victims on the basis of injury profile/condition of the victims to provide immediate or delayed care or to refer to a nearby health care facility/hospital. This triage is based on urgency (victim's condition), likelihood of survival and advance heath care facilities available. The objectives of triage are to quickly identify the victims needing immediate stabilization (filed medical care) and to identify victims needing immediate life saving surgery.

The filed triage process could be done at three levels:

i) ***On-site triage***

ii) ***Medical triage***

iii) ***Evacuation triage***

i) ***On-site triage*** is done at the disaster site and the victims categorization is done "where they are lying" ideally by using some colour code tags to reduce the incorrect classification. This is done primarily by the first responders, disaster response forces, emergency medical technicians and search and rescue workers. These trained personnel categorize victims into "acute" (red and yellow tags) and "not acute" (green and black tags). Generally, the acute victims are tied up with a red floating ribbon and the not acute victims with green ribbon to make it easier for the stretcher bearer to shift to victims to their designated places. This helps in reducing the on-site triage time to assess, categorize, mark and transport the victims to the nearest point/location where advance medical care facilities are available.

ii) ***Medical triage*** is primarily done by a team of experienced medical personnel at the point/location where advance medical care facilities are available. The objective of medical triage is to determine the type and level of medical care needed by the victims. The triage team is consisted of an anesthesiologist, emergency physician, surgeons, a gynecologist and obstetrician, and if possible a pediatrician. Accordingly, red (victims needing immediate stabilization care such as victims having respiratory distress, major internal or external bleeding, shock, head injury), yellow (victims requiring close monitoring and can be somewhat delayed such as victims with risk of shock-heart attack or major abdominal trauma, compound fractures, severe burns), green (victims requiring delayed or no treatment such as victims with minor fractures, wounds, burns), and black (for deceased) colour categories can be assigned to the victims. However, depending on the resources available and magnitude of the MCI, the triage can be done. For example, a victim with 50-60% burn injuries can be tagged with red band if the incident is small and resources are available in the health care facilities, and the same victim can wait for an hour (yellow tag) in a major MCI if the victim has no respiratory distress

iii) ***Evacuation triage*** is primarily done to again prioritize victims needing transfer by equipped ambulance with medical escort to other tertiary care level hospital with very advanced level of health care facilities available. Here the classification of victims is also done following the colour codes, but the criteria chosen may differ from the medical triage. For example, the victims needing life saving surgery, function saving surgery and ICU facilities such as ventilator, advance monitoring of cardio-vascular functions are tagged with red bands, while the victims needing major surgeries but not really life threatening could be tagged with yellow bands. The objective is to evacuate the victims from the advance health facilities, where the medical triage is done to transfer them with BLS ambulances to the tertiary care hospitals.

However, every hospital needs to mention the triage area, acute treatment and not acute treatment area with the list of triage team and minimum required equipments in its hospital disaster management/mass casualty management plan. To follow the triage protocol at three levels of triage, hospital networking and inventory assessment in hospitals also play crucial role for the activation and implementation of hospital plan.

Check Your Progress II

Note: Use the space provided for your answer.

1) Why is triage done in case of mass casualty incidents?

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2) What is the difference between three types of triage?

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3) Write three criteria for successful mass casualty management.

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2.5 PSYCHO-SOCIAL AND MENTAL HEALTH ISSUES

Disaster-affected people experience various psychological reactions. These reactions immediately follow the event while socio-economic impacts like lack of employment; homelessness, environmental destruction and disorganization emerge as a consequence following the devastation caused by the disaster.

After a disaster, the emotional reactions among members of a community may vary from the other and this also usually undergoes change over time depending upon the coping capacity and socio-economic condition of that community. Therefore, post-disaster psychological interventions should be flexible and based on an ongoing assessment of needs. The emotional reactions should be understood based on the manifestation of various stress reactions, level of effort put by the people for their own reconstruction, the pattern and amount of disability created

due to these psychological stress etc. Some factors that could influence the reactions among people are nature and severity of the disaster, amount of exposure to the disaster, availability of adequate social support, age, gender, status of the person (single, widowed, married), separation/displacement from locality, separation from family/primary support group, personal losses of the survivor (loss of kith and kin, property, source of livelihood, personal injury).

This part would be discussed more deliberatively in some other unit, which focuses entirely on disaster psycho-social support and mental health care.

Check Your Progress III

Note: Use the space provided for your answer.

1) What are the factors that could influence the emotional reactions of the disaster affected people?

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2.6 INSTITUTIONAL MECHANISM FOR DISASTER HEALTH CARE MANAGEMENT

Health is a state subject in India and the states have a three-tier system of service and health facility provision to the citizens, which consists of primary health care facilities at village level, district level hospitals and tertiary care hospitals at state level. National Health Policy and programmes are also implemented by states. Thus, the health care service organizations extend from national to village level.

At the national level, the Ministry of Health and Family Welfare (MoH&FW) has been assigned the legislative capacity for a number of health care subjects spanned from medical to dental, nursing, pharmacy, mental health, standardization of drugs, Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy (AYUSH), and epidemic prevention and control. It has two departments, health and family welfare and AYUSH. The Emergency Medical Response (EMR) division of the technical wing of the Directorate General of Health Services (DGHS) is the focal point for implementing the Emergency Support Function (ESF) plan that includes identification of nodal officers for coordination, crisis management committee and quick response teams at head quarter and field level, resource inventory, etc. the decision making body is the Crisis Management Group under the Secretary, Health and Family Welfare, which is advised by the Technical Advisor Committee under DGHS.

Medical and paramedical personnel in (i) tertiary care institutes runs by MoH&FW and (ii) available with central government health scheme could become useful for medical team deployment and mobilization in case of mass casualty incidents. Similarly for public health personnel can be deputed from the National Institute of Communicable Diseases (NICD), All India Institute of Hygiene and public Health (AIHPH) and other ICMR institutes. For investigating outbreaks, NICD is the nodal agency, which provides teaching/training, research and laboratory support.

However, health is a state subject under the present constitutional provisions. The administrative responsibility of medical preparedness and mass casualty management primarily remains with the state health departments. State health department is structured a s three-tier system, comprising of PHCs and CHCs at block levels, district hospitals at district level and tertiary care hospitals/medical institutions at state headquarters/major cities. With wide variation with multiplicity of agencies/departments that run these systems in different states, these institutions are normally overwhelmed with the routine load and their surge capacity is limited. Therefore, capacity development of these institutions at all three levels for catering to mass casualty incidents is a great challenge, hence, needs urgent attention from all role players, both Government and Private working in the health sector development planning.

Check Your Progress IV

Note: Use the space provided for your answer.

1) What is the three-tier system of providing health care services to citizens of India?

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2) What is the role of the Ministry of Health & Family Welfare in disasters?

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2.7 NATIONAL GUIDELINES ON MEDICAL PREPAREDNESS AND MASS CASUALTY MANAGEMENT

There has been a paradigm shift in the Government's focus from a reactive centric approach to a proactive approach including planning, preparedness and mitigation. It has been accepted that morbidity, mortality and mental health effects of disasters can be reduced and mitigated through proper measures. Therefore, keeping the gravity of the health risks posed by disasters, medical preparedness needs to encompass all the issues related to health and related effects as a consequences of disasters and their aftermath. In addition to trauma and suffering, these may also result in a long-term deleterious impact on the mental health status of the affected community.

These guidelines have been developed by the National Disaster Management Authority, Government of India. Under Section-6 of the Disaster Management Act, 2005 of Government of India, the National Disaster Management Authority (NDMA) is Inter alia mandated to issue guidelines for preparing action plans for

holistic and coordinated management of all disasters. The guidelines on medical preparedness and mass casualty management focus on all aspects of medical preparedness and mass casualty management with emphasis on mitigation, preparedness, relief and response. These guidelines have documented important preparatory measures which, though already existing, require definite upgradation both qualitatively and quantitatively. Latest best practices and concepts in the medical and scientific field have also been included, which may be adopted, based upon the area and need assessment analyses. These guidelines also provide important baseline information to various planners and implementers regarding different specialized facilities and methodologies required for effective implementation of health impacts of chemical, biological, radiological and nuclear disasters.

The effective implementation of these guidelines can be achieved with the collective action of all stakeholders, particularly State Governments (Especially Department of Health & Family Welfare & District Administration) and their Disaster Management Authorities.

Check Your Progress V

Note: Use the space provided for your answer.

1) What is the mandate of NDMA?

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2) How do you think that these national guidelines on medical preparedness and mass causality management would help in better health care service provisions during a disaster?

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2.8 HOSPITAL DISASTER MANAGEMENT PLAN (HDMP)

A Hospital Disaster Management Plan is a simple, comprehensive and well defined hospital disaster/emergency/crisis management activities framework prepared by a particular hospital to handle disasters/emergencies to minimize the loss of human beings and limbs, to prevent deterioration of injuries and sufferings of the survivors and to function as a life line service centre during the disasters. It considers the management protocol for both internal and external disasters, which may affect the functioning of the hospital.

The type of disaster/emergency/crisis situations hospitals may have to face are mainly:

1) Mass Casualty incidents due to natural or man-made causes;

2) Public Health Emergencies: Such emergencies may primarily be out break of infectious diseases or an after effect of natural disaster with its after effects on the Public health; and

3) Crisis situation related to Nuclear, Biological, Chemical and Radiological attacks.

The prime objective of Hospital Disaster Management Plan is to ensure mitigation and preparedness measures that have to be taken up by hospitals (irrespective of bed strength, locality, human and material resources) ***for prompt and well coordinated effective response framework for either internal or external disasters faced by the hospitals***.

Therefore each hospital in Delhi and NCR Region must follow the HDMP template, however may modify the plan keeping its own organizational structure, human and material resources and equipments in view. However, this is mandatory for each hospital to have:

i) A written plan clearly mentioning the step by step approach to be followed by the hospital in case of disaster/emergency/crisis situations.

ii) A written plan regarding hospital safety mitigation measures, such as structural and non-structural mitigation measures that can be done to ensure safe hospital.

iii) A written plan for people/teams/committees responsible for management of disasters, their roles, functions and chain of command.

iv) A written plan for communication channels and methods of dissemination of information to the hospital staff and to the public.

v) A written framework for plan activation protocol for different disasters/ emergency situations

vi) A written plan for hospital's protocol for capacity building (training and retraining) of hospital staff in various aspects of disaster health care management

The above mentioned features highlight the composition of a hospital disaster management plan. This is also important to note that the plan prepared by the hospital needs to be tested at regular intervals through Mock Drills (Table Top and Field Level) and the schedule for the same is to made explicit in the document. The document must be made available to all sections of the hospital staff working in outpatient, clinical, support services, and to the regulatory authorities.

Check Your Progress VI

Note: Use the space provided for your answer.

1) What are the key objectives of a Hospital Disaster Management Plan?

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2) Do you think this plan would be different from one hospital to another?

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2.9 LET US SUM UP

India is vulnerable to disasters caused by natural hazards on account of its unique geo-climatic conditions and by man-made disasters on account of its socio-political and cultural conditions. Health care is a critical determinant for survival in the initial stages of a disaster. The health impacts could be direct or indirect in terms of public health issues or mass casualty management. The impacts could be direct on the health sector infrastructure such destruction or damage to the hospital building, loss of or injury to the health personnel, destruction or damage to the other infrastructure within the hospital building, pressure on the existing resource while dealing with a large number of sudden influx of patients etc.

More importantly, disasters caused by natural hazards (hurricanes, floods, earthquakes, cyclones and volcanic eruptions) can contribute to the transmission of some diseases provided the causative agent is already in the environment. Although major health epidemics are rare in the aftermath of these disasters, but some disasters are so great that large numbers of the population are displaced, creating perfect conditions for the spread of disease. However, it is important to remember that epidemics do not spontaneously occur after a natural disaster. The more likely cause of disease is the lack of potable water and adequate sanitation. GIS-GPS could play a very important role in preventing epidemic.

Dimensions of disaster in terms of medical management of mass casualty incidents have increased manifold in the light of significant human-made disasters such as terrorists' attacks, bomb blasts, major fire incidents, etc. and mass casualty potential of other emergencies such as chemical/industrial, biological, radiological and nuclear incidents may be enormous in terms of casualties.

Disaster-affected people experience various psychological reactions. These reactions immediately follow the event while socio-economic impacts like lack of employment; homelessness, environmental destruction and disorganization emerge as a consequence following the devastation caused by the disaster.

Health is a state subject in India and the states have a three-tier system of service and health facility provision to the citizens, which consists of primary health care facilities at village level, district level hospitals and tertiary care hospitals at state level. National Health Policy and programmes are also implemented by states. Thus, the health care service organizations extend from national to village level. At the national level, the Ministry of Health & Family Welfare (MoH&FW) has been assigned the legislative capacity for a number of health care subjects spanned from medical to dental, nursing, pharmacy, mental health, standardization of drugs, Ayurveda, Yoga & Naturopathy, Unani, Siddha & Homoeopathy (AYUSH), and epidemic prevention and control. It has two departments, Health & Family Welfare and AYUSH. The Emergency Medical Response (EMR) division of the technical wing of the Directorate General of Health Services (DGHS) is the focal point for implementing the Emergency Support Function (ESF) plan that includes identification of nodal officers for coordination, Crisis Management Committee

and quick response teams at head quarter and field level, resource inventory, etc. The decision making body is the Crisis Management Group under the Secretary, Health & Family Welfare, which is advised by the Technical Advisor Committee under DGHS.

The National Guidelines on Medical Preparedness & Mass Casualty Management have been developed by the National Disaster Management Authority, Government of India. The guidelines on medical preparedness and mass casualty management focus on all aspects of medical preparedness and mass casualty management with emphasis on mitigation, preparedness, relief and response. These guidelines have documented important preparatory measures which, though already existing, require definite up gradation both qualitatively and quantitatively. As a critical part of these guidelines, every hospital irrespective of its locality, ownership, and bed strength has to have a hospital/health centre disaster management plan.

A Hospital Disaster Management Plan is a simple, comprehensive and well defined hospital disaster/emergency/crisis management activities framework prepared by a particular hospital to handle disasters/emergencies to minimize the loss of human beings and limbs, to prevent deterioration of injuries and sufferings of the survivors and to function as a life line service centre during the disasters. It considers the management protocol for both internal and external disasters, which may affect the functioning of the hospital.

During a disasters, when the urgent survival needs including urgent medical care are met and mortality rates have been declined by immediate mass causality management, a more comprehensive range of services are needed to be provided. Recent advances in geographical information and mapping technologies have created new opportunities for public health administrators to enhance planning, analysis, monitoring and management of health systems. Throughout all phases of a disaster, a systematic approach is needed to be developed to design, implement, monitor and evaluate these comprehensive services, which should ensure that most health needs are met with appropriate coverage, optimized access, and quality services.

2.10 KEY WORDS

Evacuation triage : It is primarily done to again prioritize victims needing transfer by equipped ambulance with medical escort to other tertiary care level hospital with very advance level of health care facilities available. The classification of victims at each stage is also done following the colour codes, but the criteria chosen may differ from one type of triage to another.

Geographic Information Systems (GIS): GIS helps generating thematic maps that depict the intensity of a disease or vector. It can also map the impact zone of vector breeding site, where control activity needs to be strengthened.

Medical triage : It is primarily done by a team of experienced medical personnel at the point/location where advance medical care facilities are available to

determine the type and level of medical care needed by the victims.

On-site triage : It is done at the disaster site and the victims' categorization is done by using some colour code tags to reduce the incorrect classification. This is done primarily by the first responders, disaster response forces, emergency medical technicians and search and rescue workers.

PTSD : Post-traumatic stress disorder is a delayed psychological consequence of exposure to overwhelming disaster event. PTSD is a serious mental health condition associated with significant problems and disabilities in the areas of psychological, biological, volitional, social, vocational, academic, and interpersonal functioning.

Triage : Triage classically means classification or prioritization of victims on the basis of injury profile/condition of the victims to provide immediate or delayed care or to refer to a nearby health care facility/hospital.

2.11 FURTHER READINGS & REFERENCES

Ministry of Health & Family Welfare - www.mohfw.nic.in

National Institute of Communicable Diseases- www.nicd.org

National Institute of Occupational Health- www.icmr.nic.in/pinstitute/nioh.htm

J. Boer & M. Dubouloz- A Handbook of Disaster Medicine

PAHO Guidelines

World Health Organisation Publications