CHAPTER

# 19

# DISASTER MANAGEMENT

1. Types of Disaster
2. Health Impact of Natural Disaster
3. Disaster Cycle
4. Disaster Preparedness
5. Triage in Disaster Management
6. Man Made Disaster
7. National Disaster Management Authority

## 1. TYPES OF DISASTER

**Introduction**

Under Disaster management act 2005, Disaster is defined as "A catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man made causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of property, or damage to, or degradation of environment and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area".

More simply Disaster is as any occurrence that causes damage, ecological disruption, loss of human life or deterioration of health and health services on a scale sufficient to warrant an extraordinary response from outside the affected community or area.

| Main classification | Sub-category | Name |
|---|---|---|
| Natural | Below the surface of earth | 1. Earthquake<br>2. Tsunami<br>3. Volcanic eruptions |
| | At earth surface | 1. Landslides<br>2. Avalanches |
| | Above the surface of earth | 1. *Meteorological phenomena*<br>a. Windstorms (Cyclone, typhoon, hurricane)<br>b. Tornadoes<br>c. Hailstorms (or Snow storms)<br>d. Sea-surges<br>e. Floods<br>f. Droughts<br>2. *Biological phenomena*<br>a. Epidemics of disease<br>b. Locust swarms (group of insects/bees) |
| Man made disaster | Caused by Warfare | 1. Conventional<br>2. Nuclear<br>3. Biological<br>4. Chemical |
| | Caused by accidents | 1. Vehicular-Air crafts, train, ship, four wheelers, two wheelers<br>2. Drowning<br>3. Collapse of the building<br>4. Explosions<br>5. Fires<br>6. Biological<br>7. Chemicals including poisoning |

## 2. HEALTH IMPACT OF NATURAL DISASTER

- **Water supply and sanitation issues** - Unfortunately, these are some of the least visible issues. This contributes to the constant challenge of ensuring that in non-disaster periods these systems are maintained properly. The systems themselves are often very expensive. And more often than not, they are in a state of disrepair.
- **Communicable and vector borne diseases** - A sudden impact disaster can create the potential for a massive outbreak of infectious diseases such as the plague outbreak following the earthquake in Gujarat.

  Communicable diseases such as acute respiratory infections or meningitis occur when large groups of people are clustered together in crowded temporary facilities as a result of population displacement.

  Hurricanes and floods can increase the chance of vector borne diseases. Malaria, Zika virus, and Dengue can be a concern in these scenarios.
- **Mental health** - Post traumatic stress disorder, anxiety, fear is very common.

**Health impact is summarised below**

| Disaster Type | Number of Deaths | Number with injuries requiring extensive treatment | Damage to health system | Damage to water system | Food shortage | Major population movements |
|---|---|---|---|---|---|---|
| Earthquakes | Many | Many | Severe, structure and equipment | Severe | Rare (may occur due to economic and logistic factors) | Rare (may occur in heavily damaged urban areas) |
| High winds, without flooding | Few | Moderate | Severe | Light | | |
| Tidal waves/ flash floods | Many | Few | Severe, but localized | Severe | Common | Common, generally limited |
| Slow-onset floods | Few | Few | Severe, equipment only | Light | Common | |
| Landslides | Many | Few | Severe, but localized | Severe, but localized | Rare | |
| Volcanoes | Many | Few | Severe, structure and equipment | Severe | Rare | |

## 3. DISASTER CYCLE

### Definition

Disaster is defined as an event or a calamity resulting either in human casualties (injuries and deaths), destruction, loss of properties, disruption of normal activities occurring in a scale sufficient to require assistance from outside the affected area.

### Disaster management cycle

There are three aspects of disaster management.

i) Disaster preparedness
ii) Disaster response
iii) Disaster mitigation

When any disaster occurs, the following sequence of action takes place, which is called as disaster management cycle. It is as follows:

a) Disaster impact
b) Response
c) Rehabilitation } Recovery phase after a disaster
d) Reconstruction }
e) Mitigation } Risk reduction phase before a disaster
f) Preparedness }

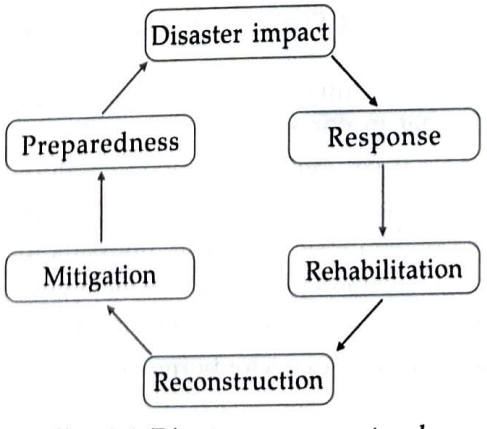


*Fig. 19.1: Disaster management cycle*

**i) Disaster impact and immediate response**

The period of impact may be few minutes in case of earthquakes, hours in cyclones and days in floods. The greatest need is the emergency care, to be given in the first few hours, as most of the injuries are sustained during the impact.

**Following steps to be followed**

- *Search, rescue and first-aid*: The organised relief services may not be sufficient to search and rescue the large number of people. Immediate help is received from uninjured survivors who assist them in search, rescue and first aid.
- *Field care*: The basic ameneties like food, shelter should be provided. The health care resources are redirected to provide care to the injured. A helpline centre should be established to respond to patients, family, friends and relatives. Every effort should be made to identify dead victims and should be shifted to separate designated place as mortuary.
- *Triage*: Since the health manpower resources are in shortage compared to casualties, the injured survivors are classified depending upon the severity of injuries and chances of survival with medical supervision. This is called as 'Triage-approach'. The categories are red, yellow, green and black.
- *Tagging*: The patients are identified with the tags which provide the information such as name, age, contact address, and the treatment given.

*Relief phase*: This starts when help or assistance is obtained from outside. Measures are taken to prevent the occurrence of epidemics. Arrangements are made to provide food, clothes, shelter and drug. Mass immunization with cholera and typhoid is not recommended. Tetanus toxoid should be given to injured person.

**ii) Rehabilitation and Reconstruction**

This should be started from the time of onset of disaster to restore as early as possible to the normal conditions of life (to predisaster condition).

**Following services are restructured and reorganized**

*Water supply*: The water should be chlorinated with residual chlorine of 0.7 ppm. The source of water should be protected from contamination.

*Food supply*: Food borne outbreak can be prevented by complaince with food hygiene and personal hygiene practices.

*Sanitation*: Temporary trench latrine should be constructed for disposing off human excreta. Washing, cleaning and bathing facilities be provided.

*Vector control*: Environmental measures to control the breeding of mosquitoes should be taken. Insecticidal spraying should be carried out.

*Care of survivors*: Efforts are made to reintegrate the survivors of the disaster into the society with the help of NGOs, department of social welfare, etc. Orphaned children should be taken care.

**iii) Mitigation**

This involves measures to lessen the likely effects of emergencies, thereby reducing the rehabilitation and reconstruction cost. These include protection of vulnerable population and structures.

For example,

- Improving the structural qualities of schools, houses and such other buildings
- Ensuring the safety of health facilities and public health services including water supply and sewerage system
- This mitigation complements the disaster preparedness and disaster response activities

**iv) Disaster preparedness**

(Refer to short note 4)

## 4. DISASTER PREPAREDNESS

**Introduction**

Disaster preparedness is a programme of long term development activities whose goals are to strengthen the overall capacity and capability of a country to manage efficiently all types of emergency.

It means that the country has a provision and is able to mobilise resources to provide assistance to the victims and bring back life to normal. Preparedness is in form of money, manpower and material.

**Objectives of disaster preparedness**

Ensure that appropriate systems, procedures and resources are in place to provide prompt, effective assistance to victims of disaster and facilitate relief measures and rehabilitation of services.

**Measures for disaster preparedness**

It is a continuous, on-going multisectoral activity.

The community should be prepared to manage any disaster. Community preparedness is a vital step in disaster management for the following reasons.

1) Community members have the most to gain from an effective and appropriate emergency preparedness.
2) When transport and communication is affected, it is the local community that can respond immediately.
3) Every community has the resources and the capabilities; and these resources should be maximised.
4) Sustained development is possible only if the community is allowed to design, manage, implement assistance programmes.

**A disaster management unit should**

- Evaluate from past experiences the risks to the area.
- Identify location of disaster prone areas.
- Adopt standard operating procedures.
- Organize communication, information and warning systems.
- Ensure co-ordination and response mechanisms.
- Develop public education programme.
- Co-ordinate with news-media.
- Maintain national and international relations.
- Organize disaster simulation exercises that test response mechanisms.
- Conduct training of health staff.
- Adopt measures for quick mobilisation of financial and other resources like foods, drugs and other essential commodities.

## 5. TRIAGE IN DISASTER MANAGEMENT

**What is Triage?**

Triage is the step carried out in disaster management to prioritize the injured for different levels of treatment.

**Why it is done?**

During disaster the number of injured is so huge that the available health manpower cannot deal with the situation. Therefore it is important to classify the injured depending on the severity of injuries and chance of survival with medical supervision. This is called as 'triage approach'. By triaging we can provide maximum benefit to a large number of injured.

**How it is done?**

Triage approach system consists of colour coding of the victims carried out at the site.

- Priority I: Red colour - This group consist of critically ill patient who need immediate medical attention/surgical treatment within 6 hours.
- Priority II: Yellow colour - This group consists of moderately ill requiring medical attention within 24 hours.
- Priority III: Green colour - This group consists of ambulatory patient of minimum risk who can be provided firs aid and treated on ambulatory basis.
- Priority IV: Black colour - This group consists of dead and moribund patients.

**Where is it done?**

Triage is to be done

- At the site of disaster, so that the patient's priority for transportation to the hospital is determined.
- At the hospital the patients are again prioritised for medical care.
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## 6. MAN MADE DISASTER

The difference between natural and man-made disasters is the element of human intent or negligence that leads to human suffering and environmental damage.

**Categories of man made disaster**

1) Sudden disaster

Bhopal gas tragedy (India) 1984 when leakage in storage of Union carbide pesticide plant released tons of methyl isocyanate gas in atmosphere killing 300 people and exposing 2 million people. Till today people are suffering from various genetic diseases.

Chernobyl nuclear power station in Soviet Union April 1986 reported accidental release of radioactive material.

2) Insidious disaster

Insidious chemical exposure or radiation exposure in laboratory, nuclear weapon production factories.

Chemical plants release toxic by-products into water bodies.

Global warming due to burning of fossil fuels, CFC etc.

3) Wars and conflicts

Attack on twin buildings of World Trade Centre in New york when 600 lost their lives and thousands were injured.

**Prevention**

- Primary prevention of occurrence of disasters like fires, explosion, crashes sudden chemical exposure etc.
  - Tighter regulation of chemical plants and other hazardous facilities.
  - Appropriate engineering and technological measures like building code, dam, design etc.
  - Early warning system.
  - Drill Training.
  - Training of manpower to prevent human errors.
- Prevent war - International concern - Peace agreement should be signed and followed by every country.

## 7. NATIONAL DISASTER MANAGEMENT AUTHORITY

**Introduction**

- Committee was formed in 1999, after the Gujarat earthquake.
- Role of the committee is to make recommendations on the preparation of Disaster Management plans and suggest effective mitigation mechanisms.
- On 23 December 2005, the Government of India (GOI) enacted the Disaster Management Act, which envisaged the creation of the
  - National Disaster Management Authority (NDMA), headed by the Prime Minister.
  - State Disaster Management Authorities (SDMAs) headed by respective Chief Ministers.

**Aim**

To spearhead and implement a holistic and integrated approach to Disaster Management in India.

**NDMA Vision**

To build a safer and disaster resilient India by a holistic, proactive, technology driven and sustainable development strategy that involves all stakeholders and fosters a culture of prevention, preparedness and mitigation.

**Organisation Structure**

- Chairman - Prime Minister of India

- Vice Chairman with the status of Cabinet Minister
- Member - eight members with the status of Ministers of State
- Based on a 'disaster divisions-cum-secretariat' system
  - Each member of the Authority heads disaster-specific divisions for specific disaster and functional domains
  - Each member has also been given the responsibility of specified states and UTs for close interaction and coordination

**NDMA Secretariat** - Headed by a Secretary

- Responsible for providing secretarial support and continuity.
- Deals with mitigation, preparedness, plans, reconstruction, community awareness and financial and administrative aspects.

**National Disaster Management Operations Centre**

- Equipped with a state-of-the-art resilient and effective communication systems.

**Functions and Responsibilities**

NDMA, as the apex body, is mandated to lay down the policies, plans and guidelines for Disaster Management to ensure timely and effective response to disasters.

- Lay down policies on disaster management.
- Approve the
  - National Plan.
  - Plans prepared by the Ministries or Departments of the GOI in accordance with the National Plan.
- Lay down guidelines to be followed by the
  - State Authorities in drawing up the State Plans.
  - Different Ministries or Departments of the GOI for the purpose of integrating the measures for prevention of disaster or the mitigation of its effects in their development plans and projects.
- Coordinate the enforcement and implementation of the policy and plans for disaster management.
- Recommend provision of funds for the purpose of mitigation.
- Provide such support to other countries affected by major disasters as may be determined by the Central Government.
- Take such other measures for the prevention of disaster, or the mitigation, or preparedness and capacity building for dealing with threatening disaster situations or disasters as it may consider necessary.
- Lay down broad policies and guidelines for the functioning of the National Institute of Disaster Management.