Public Health Aspects of Disaster Management

Facilitator:

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Specific Learning Objectives

• At the end of session, the learner shall be able to know about:
• The Asian region is one of the most disaster prone regions.
  – 60% of the major natural disasters reported in the world occur in this region.
INDIA

• Amongst the most disaster prone countries in the world
• High vulnerability to natural disasters like floods, earthquakes, cyclones and droughts.
  – Flood affects over 9 million hectares area annually,
  – 56% of landmass is vulnerable to seismic activity of varying degree and
  – 5700 kms long coastline is prone to severe cyclones with very severe loss of life and economic damage.
• India is also vulnerable to man-made disasters
  – like transportation accidents, chemical and technological disasters and other such events.
• Disaster management requires well-coordinated public policy for disaster prevention, mitigation, preparedness, emergency response and reconstruction.

• The issue becomes even more relevant since proper foresight and planning is of considerable importance for disaster management.
Definition

- 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.
Classification of Disasters

• Natural disasters
• Man-made disasters
Natural Disasters

(a) Meteorological Disasters:
   Storms, cyclones, hailstorms, hurricanes, tornados, typhoons, snow storms, cold spells, heat waves and droughts.

(b) Topological Disasters:
   Earthquake, avalanches, landslides and floods

(c) Biological Disasters:
   Epidemics of communicable diseases and insect swarms (e.g. locust swarms)
Man-made Disasters

(a) Accidents:
- Transportation accidents (Land, air and sea),
- Collapse of buildings, dams and other structures,
- Mine disasters and
- Technological failures such as mishap at a nuclear power station or leak at a chemical plant causing pollution of atmosphere.

(b) Civil disturbances:
- Riots and demonstrations.
(c) Warfare:

- Conventional warfare (Bombardment, blockage or siege);
- Non-conventional warfare (Nuclear, Biological and Chemical warfare, guerrilla warfare including terrorism).

(d) Refugees:

Forced movements of large number of people usually across the frontiers.
• Relative number of injuries and deaths differ:
  ➢ Type of disaster
  ➢ Density and distribution of population
  ➢ Condition of the environment
  ➢ Degree of the preparedness
  ➢ Opportunity of the warning.
Morbidity from disaster

- Injuries
- Emotional stress
- Epidemic of disease
- Increase in indigenous diseases
<table>
<thead>
<tr>
<th>Effects</th>
<th>Earth-quakes</th>
<th>High Winds (Without Flooding)</th>
<th>Tidal waves (Flash Floods)</th>
<th>Floods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death</td>
<td>Many</td>
<td>Few</td>
<td>Many</td>
<td>Few</td>
</tr>
<tr>
<td>Severe injuries requires extensive care</td>
<td>Overwhelming</td>
<td>Moderate</td>
<td>Few</td>
<td>Few</td>
</tr>
<tr>
<td>Increased communicable disease load</td>
<td>Potential risk following all major disaster (Probably rising with overcrowding and declining sanitary conditions)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food scarcity</td>
<td>Rare</td>
<td>Rare</td>
<td>Common</td>
<td>Common</td>
</tr>
<tr>
<td>Population displacements and movements</td>
<td>Rare</td>
<td>Rare</td>
<td>Common</td>
<td>Common</td>
</tr>
</tbody>
</table>
Effects of Disaster

• Health Problems Common to all Disasters

(a) Social reactions:
   i. Spontaneous behavioral reactions e.g. generalized panic.
   ii. Widespread looting
   iii. Rumors regarding spread of epidemic
   iv. Population displacements
(b) Exposure to elements:

The need to provide emergency shelter varies greatly with local conditions.

(c) Food and Nutrition:

Food shortages in the immediate aftermath may arise in two ways:

- Food stock destruction within the disaster area may reduce the absolute amount of food available, or

- Disruption of distribution system may curtail access to food even if there is no absolute shortage.
(d) Communicable Diseases

(i) Pre-existing Diseases in the Population:

- The risk of epidemic after a disaster is related to the endemic levels of diseases in the population.

- These include diarrhea and dysentery, cholera, measles, whooping cough, meningococcal meningitis, tuberculosis, malaria, intestinal parasites, scabies and other skin diseases, louse borne typhus and relapsing fever.
(ii) Ecological Changes resulting from Natural Disasters:

- Natural disasters may alter the potential for disease transmission by altering the ecological conditions.
- Most important diseases are those transmitted by mosquito vectors and by water.
- The breakdown in living conditions following disasters may increase the hazard of transmission of plague, louse borne typhus and relapsing fever.
- The incidence of dog bite and risk of rabies may increase as neglected strays come in close contact with persons living in temporary shelters.
(iii) Population Movements:

- Increasing population density causing burden on the water supply and other services in the receiving areas.
- Introducing susceptible population to a new disease or disease vector.

- The important diseases to occur in temporary settlements are diarrheal diseases and dysentery, viral hepatitis, measles, whooping cough, malaria, tuberculosis, scabies and other skin infections.
(iv) Damage to public Utilities:
- Damage to water supplies and sewage disposal systems may increase water borne and excremental diseases.

(v) Interruption in Public Health Services:
The important services interrupted in this context are
- Vector control programme, which might lead to resurgence of malaria and other vector borne diseases,
- Routine immunization programme against measles, whooping cough, poliomyelitis, tuberculosis and diphtheria.
(vi) Altered Individual Resistance to diseases:

Protein Energy Malnutrition, which affects children in poorer population of most of the developing countries, increases susceptibility to many communicable diseases including malaria and tuberculosis.
Elements of Disaster Management

• The spectrum of disaster management involves:
  ➢ Disaster prevention,
  ➢ Mitigation,
  ➢ Preparedness,
  ➢ Response and
  ➢ Recovery
Disaster Prevention

• Measures, which are aimed at:
  – impeding the occurrence of a disaster event and/or
  – preventing such an occurrence having harmful effects on communities.

• The formulations and implementation of long-range policies and programs.
Disaster Mitigation

• Measures aimed at reducing the impact of a natural or man-made disaster on a nation or community.
Disaster Preparedness

• Measures, which enable governments, organizations, communities and individuals to respond rapidly and effectively to disaster situations.
  – Preparedness measures include the formulation of viable disaster plans, the maintenance of resources and the training of personnel.

• Organizing, planning, coordinating, resources planning and training are its major concerns.
Disaster Response

• Response measures are those, which are taken immediately, prior to and following disasters.
• Such measures are directed towards saving life and protecting property and dealing with the immediate damage caused by the disaster.
• Its success depends vitally on good preparedness.
Disaster Recovery

• Recovery is the process by which communities and the nations are assisted in returning to their proper level of functioning following a disaster.
  – Disaster situation has been conceptualized as a process with differing phases.
  – In each different phase, the information needed, the action required, the problem encountered and people involved may be quite different.
DISASTER MANAGEMENT CONTINUUM

Proactive Strategy

Holistic & Continuous Process

Fundamental to Prompt and Effective Response

Disaster Management Continuum

Prevention

Mitigation

Preparedness

Capacity Development

Response

Rehabilitation

Reconstruction

Recovery

Immediate Relief

Assessment

Rescue

Incident
Disaster Impact and Response

• Greatest need for emergency care occurs in first few hours.

• **Search, rescue and first-aid:**
  – Most immediate help come from uninjured survivors.

• **Field care:**
  – Convergence on health facilities, irrespective of its operating status.
  – Bed availability; and medical & surgical services
  – Response to enquires.
Triage

• Quantity & severity of injuries >> Operating capacity of health facilities.
• At the site of disaster
• Rapidly classify the injured on basis of
  – Severity of their injuries, and
  – Likelihood of their survival with prompt treatment
• Four colour code system:

<table>
<thead>
<tr>
<th>High priority treatment or transfer</th>
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</thead>
<tbody>
<tr>
<td>Medium priority</td>
</tr>
<tr>
<td>Ambulatory patients</td>
</tr>
<tr>
<td>Dead or moribund patients</td>
</tr>
</tbody>
</table>
• **Tagging:**
  – name, age, place of origin, triage category, diagnosis & initial treatment

• **Care of the dead:**
  – Removal of the dead from the disaster scene
  – Shifting to the mortuary
  – Identification
  – Reception of bereaved relatives
Relief Phase

• Assistance from outside starts to reach disaster area.
• Type & quantity of relief supplies depends upon:
  – Type of disaster
  – Type and quantity of supplies available locally.
• Rapid damage assessment
Epidemiological surveillance and Disease control

Principals of preventing and controlling communicable diseases after a disaster are to:

1. Implement as soon as possible all public health measures to reduce the risk of disease transmission
2. Organize a reliable disease reporting system to identify outbreaks and to promptly initiate control measures
3. Investigate all reports of disease outbreaks rapidly.
Vaccination

• Vaccination against Typhoid, Cholera, Tetanus

   NO

   ➢ Compliance, Sterilization, Human workforce
   ➢ False sense of security

• Vaccinations are recommended for Health Workers.
• Cold-chain should be maintained.
Nutrition

• Infants, children, pregnant & lactating women, sick persons.

• Steps to ensure food relief:
  – Assessing the food supplies after the disaster
  – Gauging the nutritional needs of the affected population.
  – Calculating the daily food rations and need for large population groups.
  – Monitoring the nutritional status of the affected population.
Rehabilitation

• Restoration of the pre-disaster conditions.
• Priorities shift from health care needs towards environmental measures.

Water supply:
• Survey of water sources and distribution system
  – Physical integrity, remaining capacities, bacteriological & chemical quality.
• Chlorination.
• Ensure adequate excreta disposal at a safe distance from water source.
• Restrict access to people and animals; and prohibit bathing, washing.
Food safety:
• Kitchen sanitation
• Personal hygiene of individuals involved in food preparation.

Basic sanitation and personal hygiene:
• Washing, cleaning and bathing facility
• Emergency latrines

Vector control:
• Intensified vector control programmes.

Reintegrate disaster survivors into the society.
Disaster mitigation

• Measures designed:
  – To reduce hazards from causing disaster
  – To lessen the likely effects of disaster.

• Include:
  – Flood mitigation works
  – Appropriate land use planning
  – Improved building codes
  – Reduction/protection of vulnerable population and structure.
  – Safety of health facilities and public health services.
Disaster Preparedness

• A programme of long term development activities
  – to strengthen the overall capability and capacity of a country to manage efficiently all types of emergencies.

• Objectives:
  ➢ To ensure that appropriate systems, procedures and resources are in place to provide prompt effective assistance to disaster victims, thus facilitating relief measures and rehabilitation of services.
Intersectoral coordination to carry out:

1. Evaluate the risk of the country or particular region to the disaster
2. Adopt standards and regulations
3. Organize communication, information and warning systems
4. Ensure coordination and response mechanisms
5. Adopt measure to ensure that financial and other resources are available for increased readiness and can be mobilized in disaster situation
6. Develop public education programmes
7. Coordinate information session with news media
8. Organize disaster simulation exercises that test response mechanisms.
हमारी प्रकृति बचेगी आपातकाल से...

आपातकाल आया देखो ! आपातकाल आया,
चाहे तरफ हुक्कों को साथ लाओ,
भूकंप, बाढ़, ज्वालामुखी जैसे आपातकाल को वे हैं अपने साथ लाओ
अब लड़णा हमें क्षणिक हैं जब्तीकर उन्न नहीं क्षण से है।

हथ पे हाथ रखकर जरूर बैठे हो करना है एक आसान काम
बंस लेना है आज़ मौकक्षील में भाज
अब भूकंप को हम देंगे मुंह टोड़ जवाब
जब्तीकर न हाथ अब तैयार

उन्न उनका सरमाथान नहीं
बंस उनका हुल नहीं
बंस दवाना पानी दवाओ साध
जब्तीकर जिवंती मंडाना है अपने हाथ
अब आपातकाल से मंडाना है और भी आसान
जब्तीकर न हाथ अब तैयार
आओ हाथ वे हाथ मिलाएँ

और आपातकालीन हेल्पलाइज नगरबंद
एक शुद्ध भात भात का नगरबंद घुमाएँ
वंदे हम सब है अब तैयार
तो जिवंती मंडाना है और भी आसान।

निया दास
लखा – इमर्दी
मेटर यहूदी नवृत्त, तिलक लेख, नई दिल्ली-०१

Thanks.