

# INTERCONNECTIONS OF DISASTER RISK MANAGEMENT & PUBLIC HEALTH

## **BASIC CONCEPTS**

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# WHAT IS DRM?

- Collective actions and efforts of concerned institutions, policies, programs, and other measures designed to prevent, mitigate, prepare for, and respond to a disaster and to provide recovery and rehabilitation support.
- The systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster.



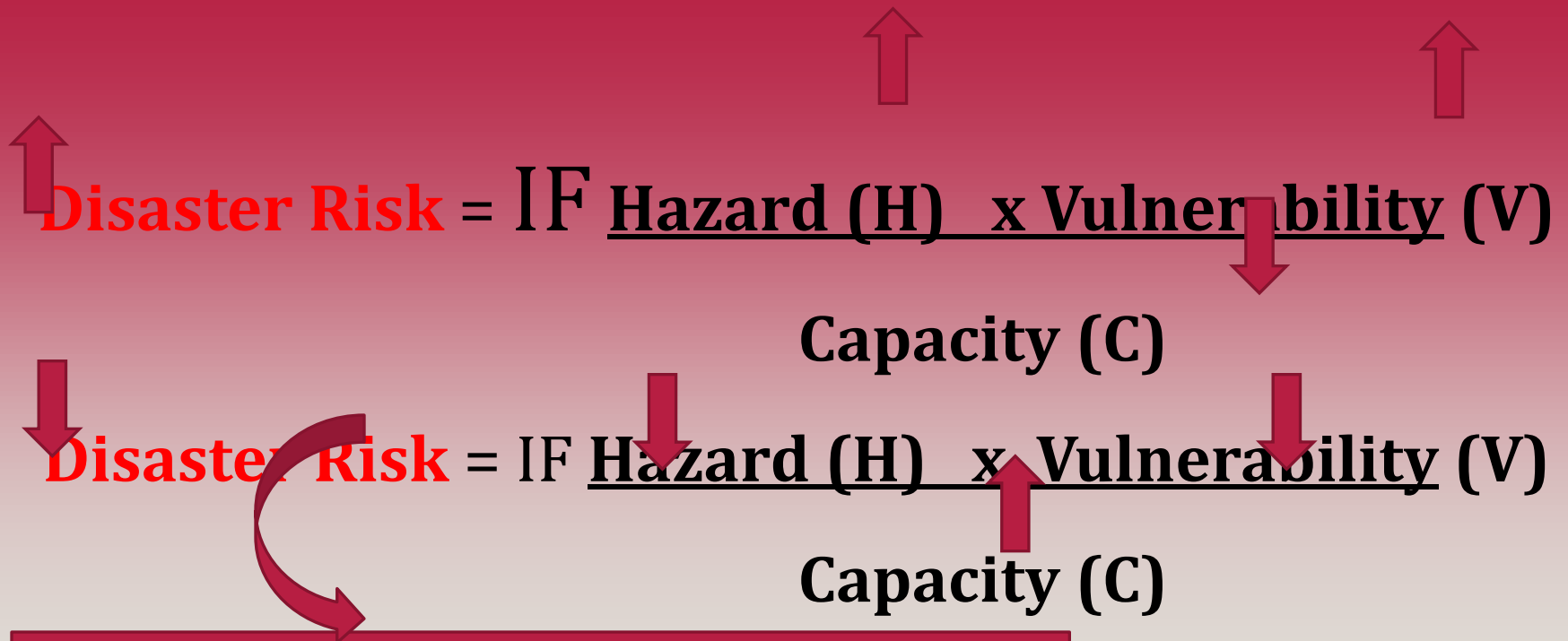
# DISASTER RISK MANAGEMENT

<b>BEFORE</b> (Prevention, Mitigation, Preparedness)	<b>DURING</b> (Response, Relief)	<b>AFTER</b> (Recovery, Rehabilitation Reconstruction)
<ul style="list-style-type: none"><li>■ Risk Assessments</li><li>■ Early Warning Systems</li><li>■ Mainstreaming</li><li>■ Programmes for DRR</li><li>■ Capacity Building</li><li>■ Institutional Strengthening</li><li>■ Advocacy</li><li>■ Awareness Raising</li><li>■ Knowledge Development</li><li>■ Community Involvement</li><li>■ Development of risk reduction tools</li></ul>	<ul style="list-style-type: none"><li>■ Warnings and Evacuations</li><li>■ Damage Assessment</li><li>■ Needs Analysis</li><li>■ Emergency Operations</li><li>■ Provision of aid</li><li>■ Shelter, food, health, WASH etc</li><li>■ Strengthen coordination mechanisms</li><li>■ Evaluate and apply lessons learnt</li><li>■ Mainstreaming</li></ul>	<ul style="list-style-type: none"><li>■ Risk Assessments</li><li>■ Development of recovery strategies, frameworks, policies and projects that reflect DRR considerations</li><li>■ Restoration of critical services in Disaster context</li><li>■ Reconstruction activities</li><li>■ Awareness-raising</li><li>■ Community involvement</li><li>■ Ongoing development</li><li>■ Evaluate and apply lessons learnt</li><li>■ Development Practices</li></ul>



# DISASTER RISK EQUATION

**Disaster Risk** = is a function of (hazard, vulnerability, and capacity)



**THIS IS THE GOAL OF  
DRR/DRM EFFORTS**

# WHY DISASTER RISK REDUCTION IS IMPORTANT?

- Disaster risk reduction (DRR) protects the lives and livelihoods of communities and individuals who are most vulnerable to disasters or emergencies.
- Whether the crisis is caused by nature or humans (or a combination of both), DRR **limits its negative impact on those** who stand to lose the most.

# *WHY DISASTER RISK CONCERNS ARE IMPORTANT*

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The current state of disasters and the prevalence of disaster risks in the world present a challenge to all to address the problem of disaster risks as they impact on humanity, the environment and the future.

- Based on the recent trends of increased toll on human lives, properties, economy and the environment due to disasters and the inadequacy of response and coping systems, the disaster potential of natural hazards and the vulnerability of social systems have worsened.





## THE DISASTER POTENTIAL OF NATURAL HAZARDS IS LIKELY TO INTENSIFY BECAUSE OF

1. increase in population and population density;
2. increase in population exposed to natural hazards;
3. increased use of hazard-prone land for productive purposes; and
4. expected increase in hazard intensity and/or frequency due to climate change and other human interventions into geo-chemical cycles.

# NEED FOR DISASTER RISK MANAGEMENT

In History, disasters have adversely affected human's form of existence.

In response, individuals and societies have made many attempts to reduce their vulnerability to the consequences of these disasters, develop measures to address initial impact, as well as post-disaster response and recovery needs.

➤ Regardless of the approach adopted, all of these efforts have the same goal: disaster risk management



# GLOBAL DISASTER TRENDS

*Trend 1: The Overall Number of People Affected by Disasters Is Rising:*

*Trend 2: Overall Disasters Are Becoming Less Deadly:*

3. *Trend 3: Overall disasters are becoming more costly:*

4. *Trend 4: Poor countries are disproportionately affected by disasters.*

5. *Trend 5: The number of disasters is increasing each year:*



# **WHY WE NEED DRR/DRM**

*Because incidence of disasters and number of people affected are increasing.*

*Disasters are costly.*

- 3. Disasters increase poverty.**
- 4. Inappropriate disaster response aggravates the problem.**
- 5. Disasters pose a significant threat to development..**
- 6. Investment in disaster risk reduction is beneficial.**

# THE PHASES OF DISASTER MANAGEMENT

Prevention

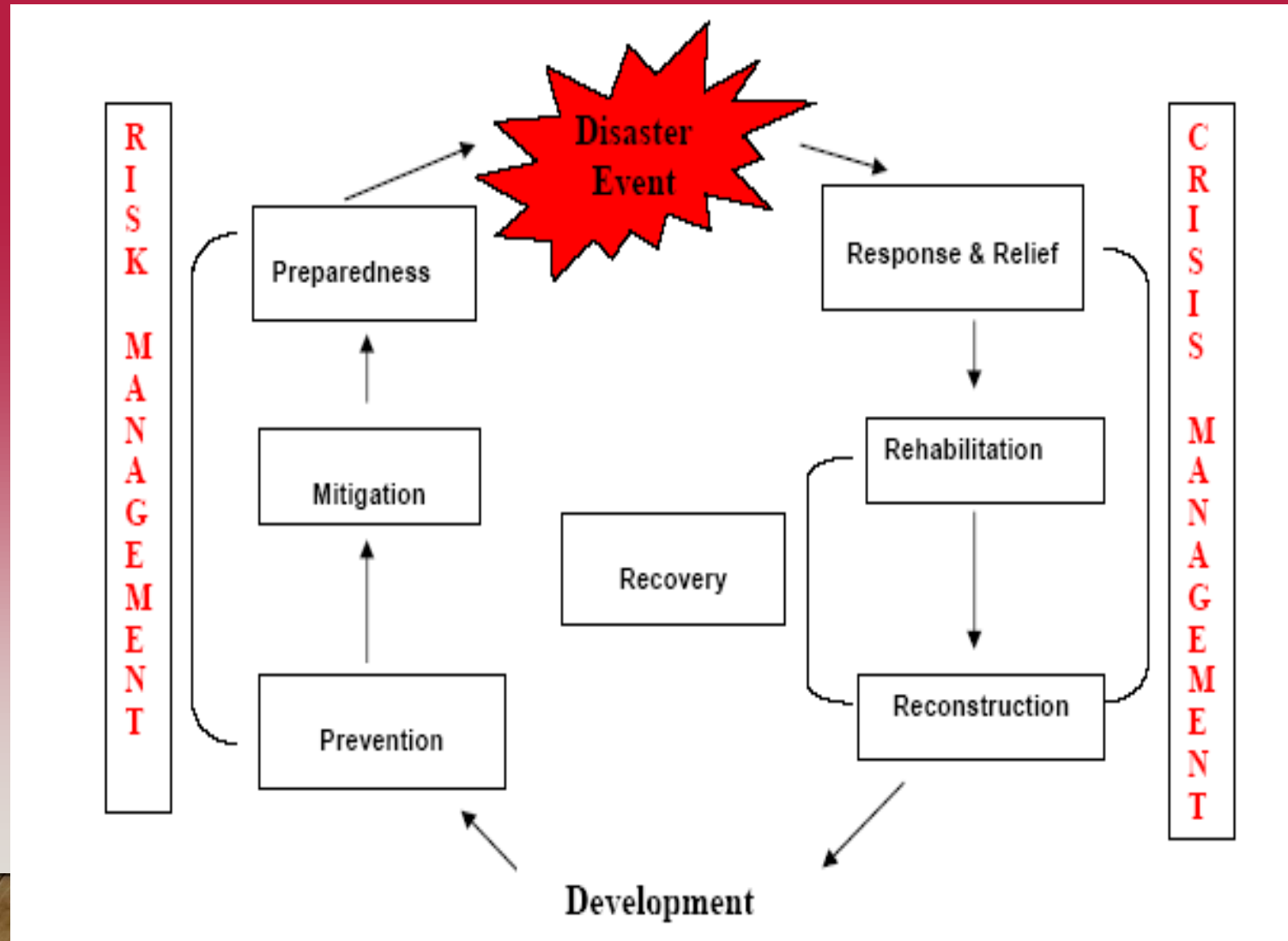
Mitigation

- Preparedness
- Emergency Response
- Relief and Rehabilitations
- Recovery
- Reconstructions

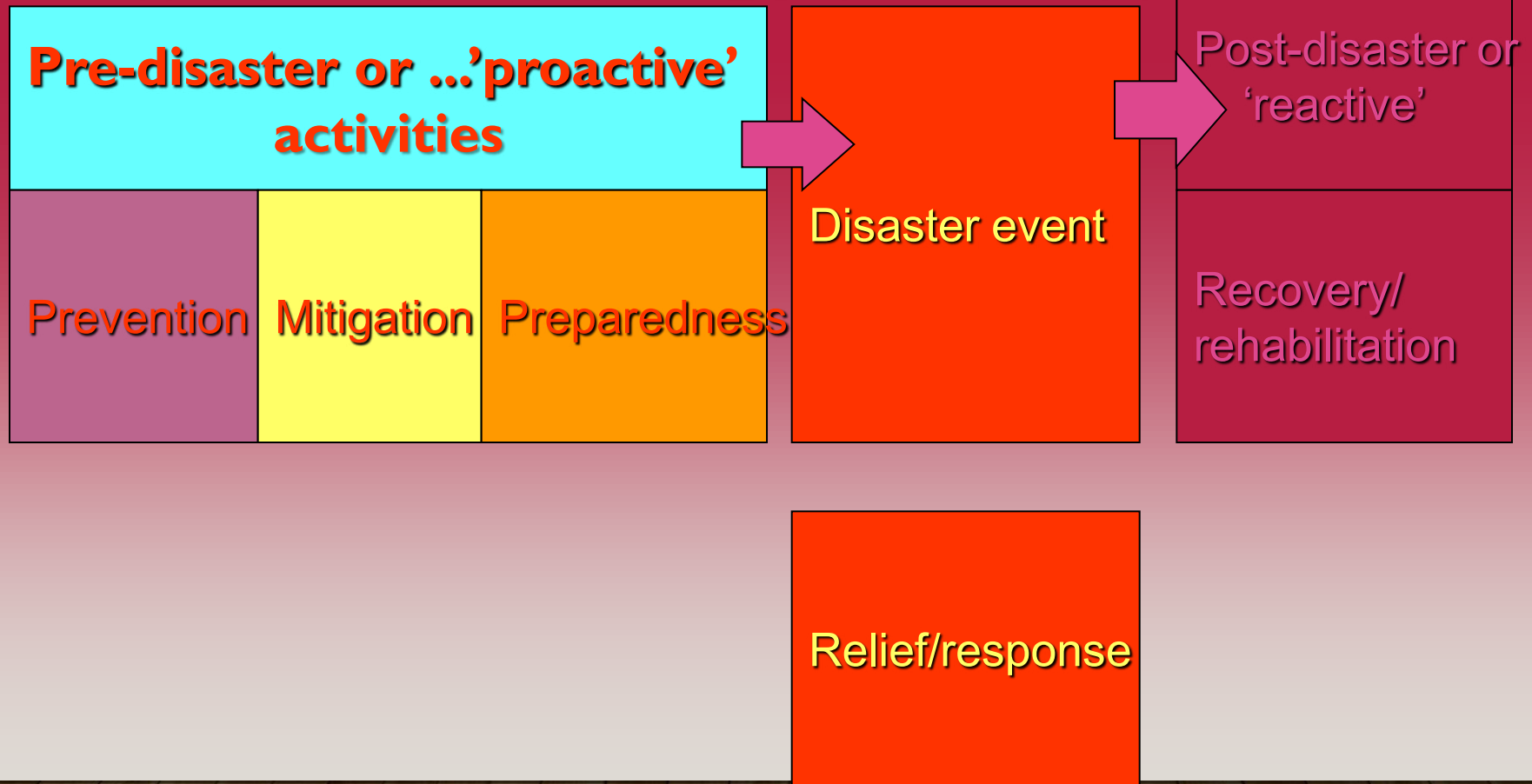




# DISASTER MANAGEMENT CYCLE



# DISASTER RISK MANAGEMENT IS AN ORGANISED ACTION ON



**Integrated Risk Management (IRM)** is a holistic, multidisciplinary way of managing risk and increasing community resilience. It builds on Disaster Risk Reduction (DRR) and integrates key elements from Climate Change Adaptation (CCA) and Ecosystem Management and Restoration (EMR).

- IRM is the systematic process of reducing disaster risks through anticipative, absorptive, adaptive and transformative actions, taking into account the effects of climate (change) and the role of ecosystems. It addresses the drivers of risk, the capacities and assets of communities and individuals and their enabling environment.



# PURPOSE OF IRM

The main purpose of IRM is to make communities less dependent on external assistance to deal with disaster risk so that they are able:

- to **anticipate** the risks they face by building on existing capacities
- to **respond** when disaster strikes while maintaining basic structures and functions
- to **adapt** to changing risks and to a changing location, situation and its livelihood options
- to **transform** themselves to address underlying factors and root causes of risk

## THE UN AND DISASTER RISK REDUCTION

- In 2005 & 2015, respectively UNDRR facilitated the negotiations amongst Member States, experts and collaborating organizations; which led to the adoption of the **Hyogo Framework 2005-15 & Sendai Framework for Disaster Risk Reduction 2015-2030**.
- Between 2005-2015 and 2015 - 2030, Member States around the world will conduct a variety of efforts within the context of the five key action points – 5 priority for actions (Hyogo framework) and **four Priority Areas** contained in the Sendai Framework, as a way to reduce risks with the goal of minimizing losses due to the manifestation of hazards of natural origin.



# **HYOGO FRAMEWORK FOR ACTION, 5 PRIORITY FOR ACTION**

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- The Hyogo Framework for Action identifies 5 priorities for action towards strengthening community and country resilience to disasters. The application of these 5 priorities for health and the health sectors as described below
- **Priority 1: Disaster** risk management as a national and local priority
- **Priority 2:** Risk assessment and early warning
- **Priority 3:** Education and information to build a culture of, safety and resilience at all levels
- **Priority 4:** Reduction of underlying risk factors to disasters
- **Priority 5:** Emergency preparedness for effective response and recovery at all levels.

## THE FOUR PRIORITY AREAS OF SENDIA FRAMEWORKS ARE:

- Priority 1: Understanding disaster risk
- Priority 2: Strengthening disaster risk governance to manage disaster risk
- Priority 3: Investing in disaster risk reduction for resilience
- Priority 4: Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction

# DISASTERS IN HORN OF AFRICA

- Horn of Africa countries including Somalia are highly vulnerable to a wide range of disasters
- These are-
  - drought
  - flood
  - human and livestock diseases & environmental degradations
  - crop pests
  - Fires
  - conflict etc.
- Drought remains the country's leading major hazard followed by Flood
- **Disasters** related to these hazards **have increased** in terms of:
  - Frequency
  - Area coverage
  - Number of people affected.

# WHY DRR

- Minimizing impacts of disasters
- Maximizing readiness to respond

**1\$ vs 7\$**



**DRR measures**

# IMPACTS OF DISASTERS GLOBALLY

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- Impacts on Health
- Impacts on Economic and Development



# KEY FACTS ABOUT HEALTH & EMERGENCIES

- Morbidity always pre-exists in communities prior to the occurrence of disasters.
- Not all natural disasters or emergencies have an impact on the health system
- Occurrences of health system consequences of emergencies depends on many factors
  - Type of Disaster
  - Pre-disaster status of health system
  - Public health situation and disease pattern of the area prior to the crises
  - Impacts of the disaster on other sectors such as water, sanitation, shelter
  - Population displacement
  - Effectiveness of the response to the disaster
  - Socioeconomic status of the area prior to the emergency



- ✓ Natural disasters cause public health emergencies, which displaced a significant number of people
- ✓ Basic health and medical infrastructure damage
- ✓ Problem with fundamental resources; food, shelter, clean water
- ✓ Catalyst for generation and transmission of disease and infection
- ✓ Disaster impact public health system and its protection, infrastructure, other sectors like water sanitation, shelter, food and nutrition.



# IMPACTS OF DISASTER: PUBLIC HEALTH

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- Occurrence of public health impact of crises depend on other sectors such as protection, shelter, Wash
  - Some emergencies have direct impact on health while some are indirect
- Direct :** Earthquakes ( trauma, lacerations, fractures, amputations)
- Indirect:** Floods/droughts,/cyclones(epidemic, disease, malnutrition, mental health and psychosocial problems, MCH).

# IMPACTS OF DISASTERS: PUBLIC HEALTH

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## Pre impact conditions

- Hazard exposure
- Physical Vulnerability
- Social vulnerability

## Pre impact conditions

- Health system performance
- Financing system
- Creating resources capacity
- Delivering services
- Security and health protection system
- Infrastructure
- Information and communication

# IMPACTS OF DISASTERS: PUBLIC HEALTH

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## Direct impact

- **Mortality**
- **Injuries:** physical trauma or injuries that required immediate assistance
- **Homelessness:** house destroyed, who need shelter after an event
- **Affected:** people who required immediate medical assistance during a period of emergency ( basic needs, food, water, sanitation)

## Direct Impact

- Communicable disease
- Acute illness
- Chronic Illness
- Psychological Effects
- Food and nutrition
- Environmental Health Problems
- Health care system: infrastructure damage, loss of health personnel



# IMPACTS OF DISASTER: PUBLIC HEALTH

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## Indirect impact

- ✓ Loss of primary health care facilities
- ✓ Loss of normal living conditions
- ✓ Health care system external infrastructure damage

## Long term impact

- Post disaster failure to restore normal public health program
- Food and nutrition insufficient
- PEM
- Micronutrient and calorie demand

# IMPACTS OF DISASTER: PUBLIC HEALTH

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## Long term impact

- Post traumatic stress disorder
- Depression
- Anxiety
- Non specific medical symptoms
- Chronic medical problems: Respiratory and cardiovascular disease
- Immunization coverage
- Vector born disease: flies, mosquito, rats

## Long term impact

- Hygiene problems: loss of basic structure
- Persistent physical health consequences
- Hygiene prevalent in :
  - ✓ rescue worker, injured during trauma
  - ✓ Who lost homes, property, belongingness
  - ✓ Family of those injured
  - ✓ Post disaster: management of human excreta
  - ✓ Altered individual resistance to disease

# PUBLIC HEALTH IMPACT OF FLOODS

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## Floods

- ✓ Socio economic impact
- ✓ Effect on infrastructure
- ✓ Environmental Impact

## Environmental Impact

Destruction of sanitary facilities

Lack of clean water increased parasites in the environment

## Floods on Socioeconomic impact

- Loss of livelihoods and assets ( reduced access to food)
- Loss of shelter
- Displacement Erosion of community social structure and coping mechanism

## Effects on Infrastructure

- ✓ Destruction of health care infrastructure
- ✓ Disruption of social services ( water supplies, electricity, latrines,)
- ✓ Destruction of roads

# PUBLIC HEALTH IMPACT OF DROUGHTS

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## **Drought**

- ✓ Water shortage
- ✓ Crop failure
- ✓ Loss of livestock
- ✓ Increased food price
- ✓ Reduced access to food
- ✓ Reduced food intake
- ✓ Los of purchasing power
- ✓ Displacement/forced migration

## **Water shortage impact**

- Epidemics , cholera, typhoid, skin disease  
Eye disease
- Malnutrition and avitaminosis
- Increased illness
- Maternal and child health risks
- Alcholism
- Increased GBV, STI, HIV

**All the above impacts will results Increased morbidity and mortality**

# PUBLIC HEALTH CONCERNS; MAIN PROBLEMS

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## **Environmental Health problems**

- **Water sanitation, hygiene and vector born conditions due to:**
  - ✓ Poor water supplies
  - ✓ Inadequate hygiene and sanitation
  - ✓ Increased incidence of diarrhea, dysentery, respiratory, infection and other communicable disease
  - ✓ Waste water management
  - ✓ Hygiene

## **Shelter**

- **Displaced**
- **Internal Migration**
  - ✓ Displaced people living in parks, city squares, public buildings, schools, vacant area
  - ✓ 3.5 square meter/person in emergency situation

# PUBLIC HEALTH CONCERNS; MAIN PROBLEMS

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## **Disease epidemics**

### **Water related communicable disease**

- ✓ Diarrhea, typhoid, dysentery,
- ✓ Hepatitis, A&E
- ✓ Leptospirosis

### **disease associated with crowding**

- ✓ Measles
- ✓ Neisseria Meningitis
- ✓ ARI

## **Disease epidemics**

### **Vector born disease**

- ✓ Malaria
- ✓ Dengue

### **Other disease**

- ✓ Tetanus
- ✓ Typhus
- ✓ Incidence of dog bite: rabies
- ✓ Relapsing fever
- ✓ Scabies



# PUBLIC HEALTH CONCERNS; MAIN PROBLEMS

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## Immunization

**Mass immunization urgent required**

- ✓ Hepatitis B
- ✓ TB
- ✓ Measles
- ✓ Vitamin A Supplement

## Food and nutrition

- ✓ Food supply Shortage
- ✓ Food stuck destruction
- ✓ Food distribution problems
- ✓ Food safety and suitability

# PUBLIC HEALTH CONCERNS; MAIN PROBLEMS

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## **Social Reaction/Mental Health**

- ✓ Spontaneous behavioral reactions:  
eg. generalized panic
- ✓ Population displacement
- ✓ Antisocial behavior
- ✓ Shock, denial

## **Interruption in Public Health Facilities**

- Routine immunization programme
- Vector control Program
- Damage to public health facilities: water, supplies, & sewage disposal system that increase water and excremental disease

# PUBLIC HEALTH CONCERNS; MAIN PROBLEMS

## **Mortuary Services**

- ✓ Danger of disease transmission from decaying bodies
- ✓ Handling technique
- ✓ Immunization Hep B, TB
- ✓ Training to use body bags
- ✓ Gloves
- ✓ Disinfection of equipment

# THE WHO HEALTH SYSTEM FRAMEWORK

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## **System building blocks**

- ✓ Service delivery
- ✓ Health workforce
- ✓ Information
- ✓ Medical products, vaccine & technologies
- ✓ Financing
- ✓ Leadership and Governance

**( will lead Access coverage & quality safety)**

## **Over All Goals/Outcomes**

- ✓ **Improved Health ( level and equity )**
- ✓ **Responsiveness**
- ✓ **Social and Financial Risk Protection**
- ✓ **Improved efficiency**

# GENERAL IMPACT OF DISASTERS ON HEALTH SYSTEM

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## Health workforce

- Illness, disability, and death due to hospital acquired infections, injuries & violence
- Displacement as a result of insecurity or destruction of living quarters
- Psychological trauma due to illness, death & disability of colleagues & displacement

## Health Information Management

- ✓ Collapse of health information management system
- ✓ Inability to effectively monitor health performance & status

## Medical Products, Vaccine and Technologies

- ✓ Looting of medical supplies & equipment
- ✓ Breakdowns of supplies chain management system due to insecurity, poor access
- ✓ The above results in drug stock-outs

## Health Financing

- Diversion of health resources to other sectors such as defense thus resulting in reduced spending on health
- Increased cost of delivering health care

# GENERAL IMPACT OF DISASTERS ON HEALTH SYSTEM

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## Leadership & Governance

- ✓ Breakdown of strategic policy framework for health
- ✓ Lack of oversight function( supervision, monitoring and evaluations)
- ✓ Inability to inforce health regulations and ensure accountability

## Health Service delivery

- ✓ All of the above results in:
- ✓ Reduced access to health service
- ✓ Poor coverage of public health interventions e.g immunization
- ✓ Poor quality of available heath services
- ✓ Unstable health care services



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# **EMERGENCY RISK MANAGEMENT FOR HEALTH MASS FATALITIES/DEAD BODIES**

# MASS FATALITIES/DEAD BODIES

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## Key points

- The health risk to the general public from large numbers of dead bodies following emergencies arising from natural hazards is negligible.
- Capacity is needed to recover, identify, store and dispose of the large number of dead bodies that may arise in an emergency
- It is important for the psychosocial wellbeing of the living: survivors, relatives and the wider community that the dead are managed with dignity and respect.

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- Good communication on the management arrangements for the dead and the missing is critical for relatives.
- Awareness of ethical, religious and cultural sensitivity are important for those managing fatalities.
- Exposure of civilian populations to chemical, biological and radiological agents is an increasing hazard, and fatalities as a result of such hazards may pose an ongoing threat.

# WHY IS THIS IMPORTANT?

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- Larger-scale natural disasters may result in many tens of thousands of fatalities, while smaller-scale disasters involving multiple deaths often exceed the local capacities for mass fatality management. In 2010, the earthquake in Haiti recorded estimates of over 200,000 deaths, the heat-wave in Russia over 55,000 and the floods in Pakistan almost 2000 .
- Other disasters including epidemics, bombings and chemical hazards (e.g. Bhopal, India) may also result in large numbers of dead bodies. Since 2011, the internal conflict in Syria recorded estimates of over 60,000 deaths, the earthquake in Japan over 15,000 and the typhoon in the Philippines almost 1000 deaths

# CONT..

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- While local arrangements may be able to manage small numbers, they are rarely able to cope with hundreds or thousands of fatalities which may occur in an emergency. When the number of bodies exceeds normal local mortuary arrangements, mass fatality management plans may be activated to provide the additional capacities.
  - Typically the events that result in the highest numbers of fatalities are located in regions with increased risk and vulnerable populations; this is often compounded by limited infrastructure and integration of the health system into disaster preparedness, response and recovery

# EXAMPLE: SOUTH ASIA

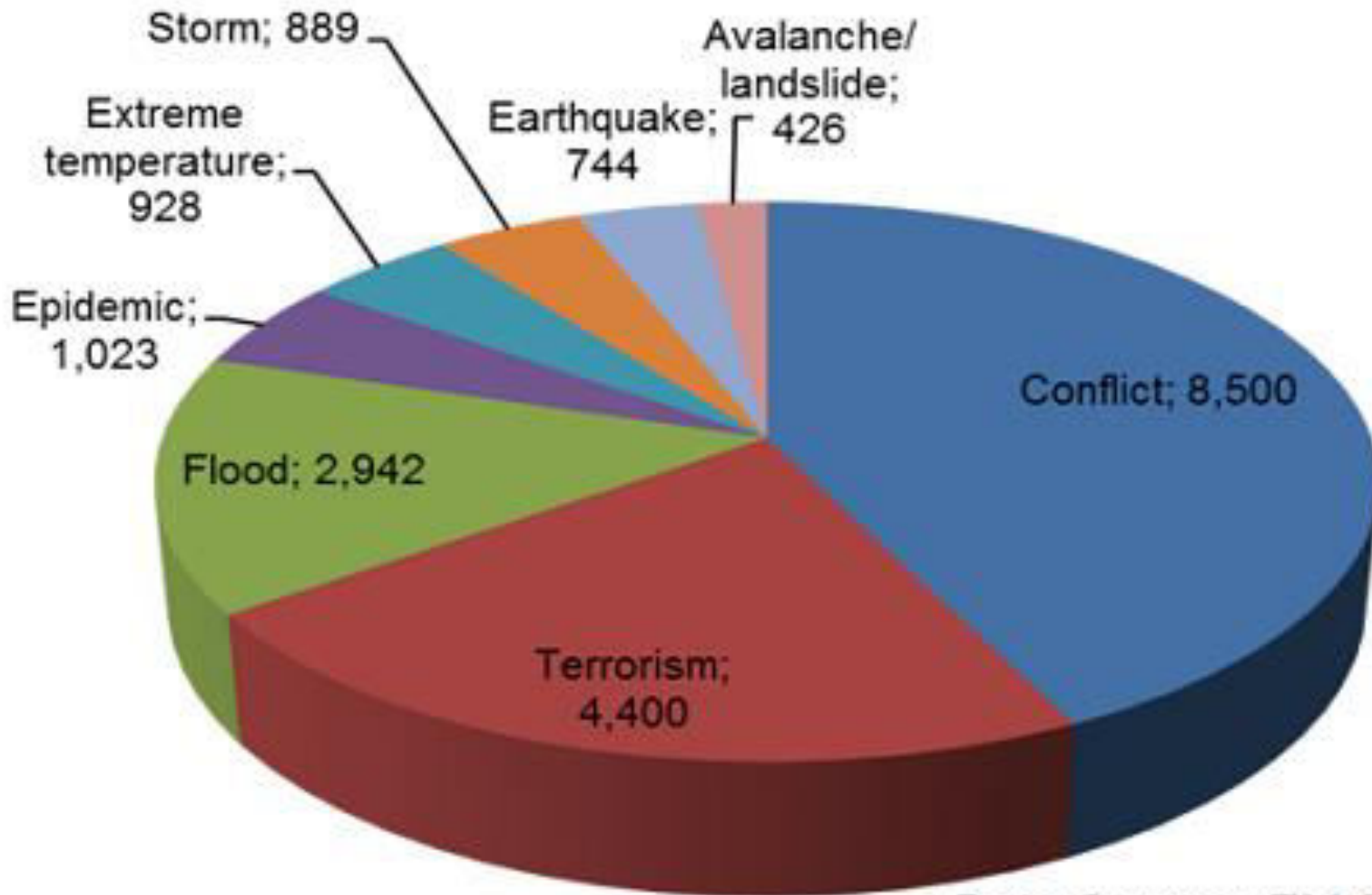
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- **Earthquake and Tsunami (2004)**
- The Sumatra-Andaman earthquake and tsunami of 26<sup>th</sup> December 2004 led to an estimated 226,408 deaths across South Asia.
- Lack of co-ordination between different organizations, communities and family members resulted initially in a lack of clear process for body recovery across three countries: Sri Lanka, Indonesia, and Thailand that were studied in post-event analysis
- Bodies were taken to multiple locations and surviving relatives suffered greatly in not knowing where family members had been taken



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## Mass fatality incidents: number of deaths by event type (2012)



Data Source: EM-DAT <sup>5</sup>

# WHAT ARE THE HEALTH RISKS?

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## General risks

- The major risk is inadequate capacity to deal with dead bodies, which may result in:
  - Distress to families and the community.
  - Diversion of vital community, health and disaster responders away from priority life-saving measures for survivors to the management of dead bodies.
  - Inappropriate practices may also cause community distress.
- The health risk to the general public from large numbers of dead bodies arising from natural hazards is negligible. However there is a risk of infection arising from consumption of water that is contaminated with feces from a dead person.

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- There may also be health risks through secondary contamination from fatalities as a result of exposure to chemical or radiological agents.
  - Psychological distress amongst the bereaved is aggravated if unable to perform funereal rites in accordance with local custom.

## **Occupational health related risks**

- There are no reports of infection arising from contact with a dead body following natural disasters, though long term follow up of personnel is yet to be undertaken.
- The majority of health effects following a natural disaster include injury/strain from lifting bodies, and injury from debris during body recovery.

# RISK MANAGEMENT CONSIDERATIONS

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- Governments and communities can ensure that mass fatalities are appropriately managed by:
- Taking coordinated multi-agency planning and preparedness measures for the management and recording of fatalities specifically addressing each of the following four stages involved in management of dead bodies:
  1. **Body recovery**
  2. **Storage of bodies:** as local custom permits, in refrigeration, cold storage or by other means until identification and handing over to family members.
  3. **Victim identification:** using fingerprints, dental records, DNA records, photo identification depending on local resources and baseline identification records

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4. **Disposal** which should reflect ethnic and religious sensitivities where possible and appropriate.
  - Additionally, following chemical, biological and radiological events, taking steps to identify and contain the causative agent.
  - Effectively communicating risk to survivors and responders including health workers, emergency responders and those living in risk prone areas about the adverse health effects from a dead person.
  - Provide access to support mechanisms for survivors, relatives and those dealing with fatalities

## SUMMARY OF PUBLIC HEALTH & DRR LINKS

- Understanding the context of the current state of disasters and prevalence of disaster risks enhances efforts to develop an effective and holistic risk management approach to optimum public health .
- Hence, the integration of Disaster Risk Management and health will provide a basic understanding of the nature of disaster risk and managing its effects through Public Health. This will make a clear understanding of the theoretical and applied disciplines that define disaster, vulnerability and risk in relation to public health.



- Therefore, managing and reducing disaster risk will contribute the attainment of sustainable development goals in general and enhancing optimum effective public health in particular.

# Ultimate Goal of integrated DRM & OH Approach

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**Facilitate and advance** sustainable development, resilient community with optimum effective public health

# CONCLUSION

Disaster risk reduction & public health is everyone's responsibility, and each level playing its part will lead towards success in disaster risk reduction & effective optimum public health

*The end!!!*