Preventative Medicine in Humanitarian Emergencies

MODULE 2

Peds Pediatrics in Disasters

Center for Global Health
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Vital signs = Disease rates

Used to compare the realities of different communities and to evaluate the success of interventions over time.

Rates = persons with disease/condition X even number of people at risk

Even number represents the size of the population: Usually either 1000, 10,000 or 100,000

Rates

It is critical to define precisely both numerator and denominator

NUMERATOR: uniform criterion to define a case, so as to ensure data can be compared

DENOMINATOR: define adequately the population at risk (usually age groups)

- **Incidence Rates:**
- Number of defined ***new*** cases in a given time (day, week, month, year) per *n* population (1000, 10,000, 100,000)

- **Prevalence Rates:**
- The ***proportion*** of defined cases present in a given population at a given time, and is expressed in percentages

Children < 5 with diarrhea

Town A = 304 cases

Town B = 1054 cases

Which town has more diarrhea problems?

Rates of diarrhea per 10,000 children < 5

Town A: 1597 children < 5

Rate= 304/1597 x 10,000=1904

Town B: 12,818 children < 5

Rate= 1054/12,818 x 10,000= 822

Hurricane in Guatemala

Destroyed roads, no electricity, inoperable land line and cell phone communications, difficult terrain, mud slides, harsh weather make it difficult to know what is happening in the urban and rural areas

You serve as a consultant helping to organize and coordinate the emergency response

What is your first recommendation?

Population Evaluation

- Demographics
- Pre-disaster health conditions
- Health care system evaluation
- Mortality and morbidity surveillance
- Emergency needs assessments

1. Demographic assessment

Counting methods

- Over flights
- Ground visual estimates
- Sampling
- Census

Population structure-male/female and age groups <5, 5-15 years and >15

At risk groups: small children, pregnant and breast-feeding women, injured and elderly

Pre- Disaster Health Conditions

Know your community before a disaster strikes

What is the baseline malnutrition rate?

What were the Immunization rates?

Where are the most vulnerable children living?

Are there vector-borne illnesses?

What are the most prevalent diseases?

Rapid Assessment Team

Within 24 hours rapid assessment teams are flown into the affected areas by military helicopter

Members:

- Doctors, nurses, surgeons,
- Psychologists
- Social workers
- Logisticians
- Water and sanitation experts
- Flight-transport specialists

Critical needs in the evaluation of emergency needs

- Safe water
- Nutritional status
- Shelter
- Basic sanitation
- Local environmental conditions
- Public Health needs

Water:
Number one priority

- 3-4 liters/person/day to maintain life*
- 15-20 liters/person/day: a better estimate- takes into account cooking and cleaning
- While at first **quantity** is more important than **quality**, improving quality will do more to prevent disease than any other measure in most disaster scenarios

Water Purification

- Cover and allow to stand
- Sand filtration
- Bulk chlorination
- Reverse osmosis: good water in large quantities, but arrives late, is expensive, not sustainable
- If other procedures not available, boiling or chlorination by individual user (least efficient method)
- The most basic distribution system will need clean containers for transportation

Shelter

- WHO recommends 3.5 m^2 per person as minimum floor space for displaced population*
- Increases to 4.5 m^2 per person in cold climates due to increased time indoors
- For all needs: cooking, cleaning, sanitation, recreation, a camp should have 30 m^2 per person
- Must be acceptable to local community or may not be used

Basic Sanitation

Latrines- portable or hand-dug

- One per 20 people
- Must be acceptable to community
- Between 6-50 meters from dwellings
- Health education/specific assignments for maintenance
- Consider children's needs, otherwise may not be used

Basic Sanitation

- Feces are a concentrated source of human pathogens
- Potential for explosive water-borne epidemics following disruption of basic sanitation services
- Keeping fecal matter away from water and food supply is critical

Nutrition

- Minimum Needs: 2,100 KCals/person/day*
- Food must be acceptable to community
- Identify community resources

Nutrition

- Know the previous acute malnutrition rate
- Malnutrition rate of children < 5 years old: gold standard for assessing group status
- Nutritional surveys: use standard sampling techniques, such as random, simple or systematic cluster or, if possible, a complete census

Local Environmental conditions

- Contamination of air, water, land
- Chemical spills
- Flash floods
- Unsafe buildings
- Smoke
- Slope
- Presence of vectors (insects)*

COMMUNITY NEEDS

- Security: prevent crime and violence
- Transportation: different kinds of vehicles
- Communications: radio, TV, internet for mass communication;
- Radio/telephone/internet for coordination of relief efforts

- ***Know your community pre-disaster capabilities/challenges!***

Surveillance
HEALTH DATA MANAGEMENT SYSTEM

- Data collection
  - Ongoing
  - Systematic
- Data analysis

TAKE ACTION BASED ON ANALYSIS

Important Data

- Deaths
- Significant morbidity or frequent illness in community
- Early warnings; e.g., a single case of cholera
- Malnutrition
- Malaria
- Serious trauma

Crude Mortality Rate *

- When assessing the outcome of a disaster, public health officers describe its severity by the number of human lives lost using the Crude Mortality Rate (CMR) or Crude Death Rate (CDR)
- CMR is defined as number of deaths per 10,000 inhabitants per unit of time

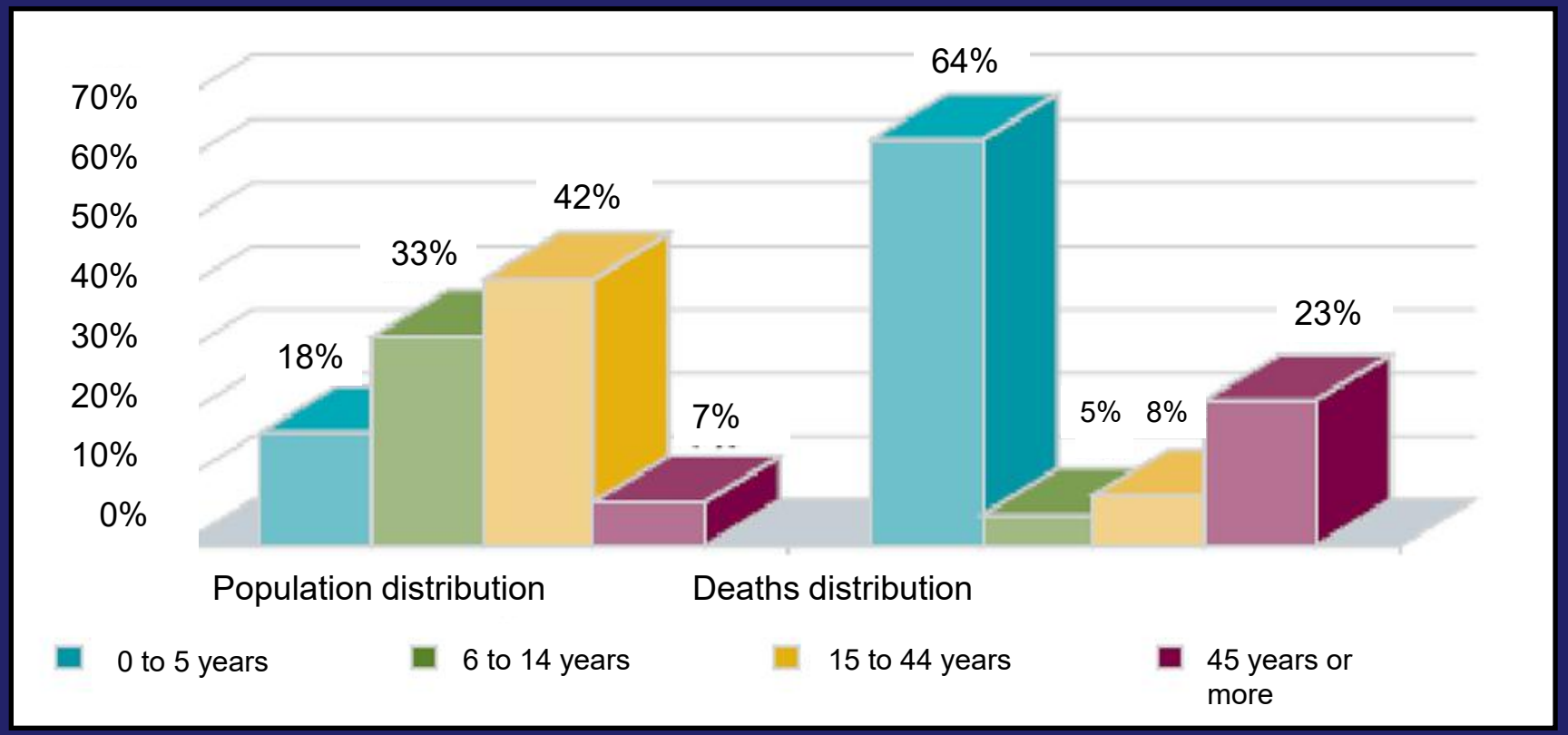
$$\text{CMR} = \frac{\text{Deaths}}{\text{Population}} \times 10{,}000 \text{ per unit of time}$$

- A humanitarian emergency **used to be indicated by**:
  - CMR of > 1 death per 10,000 people / day
  - CMR in age <5y: >2 per 10,000 people / day (under 5-mortality)

Leading Causes of Deaths

- Trauma
- Diarrheal diseases and dehydration
- Communicable diseases: Measles, Malaria, Pneumonia
- Malnutrition

AGE- SPECIFIC MORTALITY



Adapted from Toole, MJ, "Mass Population Displacement- A Global Public Health Challenge," Infectious Disease Clinics of North America, vol. 9; June 1995.

Assessment Recommendations

- Set up field hospitals and medical tents to relieve partially functioning hospitals
- Arrange transport of critical patients from affected areas to out of area hospitals
- Provide mental health services and counseling (psychologists)
- Establish security
- Mobilize military and resources to clear roads, reestablish electrical grid, distribute gas and diesel and provide security

Thank you