DISASTER PREPAREDNESS AND RELIEF
COORDINATION OF NATIONAL AND INTERNATIONAL AUTHORITIES

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1. INTRODUCTION

Disasters and major accidents may be defined as a disruption of the human ecology which the affected community cannot absorb with its own resources. Often, although there are exceptions (such as drought), most natural and technological disasters have a sudden onset.

They constitute an important health problem, because they cause large numbers of deaths, casualties and long-term disablement; may obliterate or compromise health services and facilities, and affect health and health services provision through jeopardizing economic development and other aspects of daily living.

While the response of the international community has in the past been to provide aid following disasters, governments are increasingly aware that disasters are so serious that much greater emphasis will have to be given to preparedness and for preventing their consequences, and that disaster prevention and pre-disaster planning should be an integral part of national policies and programmes. This will contribute to ensuring that they reach Health for All by the Year 2000.

In the future the response to threats to health will be not only from natural disasters but also those which arise from the preparation and use of toxic chemical and nuclear energy. Recent examples are Chernobyl, Bhopal and Basle. Awareness of these problems is new, and are seen as particularly threatening because they can involve many countries, and present many unknown elements, such as the long-term effect of radioactive substances.

Further, they involve high costs to countries which are unable to provide even basic health services to their people, require expertise unavailable and unplanned for them, and cross political, geographical and economic boundaries. These characteristics have lead to unprecedented demands for international health planning, research and cooperation. These have been accepted by the World Health Organization (WHO). In addition, the visibility of disasters, seen on television throughout the world, has the potential to attract resources for emergency aid and which are often inappropriate or excessive. Expertise is sorely needed to harness the required health personnel and resources before, during and immediately after a disaster.

Guiding principles for the health aspects of disaster preparedness and relief have been developed.

- As part of the overall plan, the health sector is responsible for all aspects of health care, including environmental health aspects;
- The community, including the primary health care sector, must be prepared to cope itself in the immediate aftermath of a disaster;
- Programming therefore must be based on the concept of primary health care;

- The health elements of a disaster preparedness programme should be agreed by all concerned;

- For the health sector part of the plan a communication and transportation system are essential; and

- The health sector plan should be part of the normal infrastructure for health.

2. OBJECTIVES OF A PROGRAMME

Disaster preparedness as related to health has three objectives which are to:

- prevent, reduce and mitigate the effects of disasters on the health of populations;

- protect or re-establish health services and facilities;

- ensure the prompt restoration of health conditions prevailing before the disaster and, whenever possible, bring about an improvement in these conditions.

3. THE TIME FRAME OF DISASTER PREPAREDNESS

For planning purposes, it is helpful to consider disasters within a framework of five successive time phases:

(a) **The silent phase** is the time for planning, before the disaster has occurred and when there is no premonitory sign of its imminent occurrence.

(b) **The pre-disaster phase** is the time for warning and taking protective action or escaping.

(c) **The isolation phase** is the time of chaos, death and shambles. The needs exceed the resources and the isolation of the population intensifies the anxiety and fear and may magnify the urgency of the situation. Initially, the disaster-struck community will by necessity rely on its own resources for rescue and first aid. In the recent earthquakes in Italy, most of the rescue was carried out by the local community, using its own local resources.

(d) **The phase of external assistance** begins with the arrival of external assistance. It includes late rescue and relief, but in order to respond efficiently and effectively to the actual needs, external aid should be based on accurate information collected locally both in advance of the disaster and as soon as possible after the disaster has occurred.

(e) **The rehabilitation phase** ends when the situation has returned to the normal pre-disaster situation, or ideally to better conditions. Many of the measures taken during the relief phase may have an effect on the long-term rehabilitation of a community affected by a disaster, such as permanent relocation in temporary shelters or improvised dwellings or continued reliance on external aid.

4. BASIC ELEMENTS OF A DISASTER PREPAREDNESS PROGRAMME IN A COUNTRY

The basic elements of a disaster preparedness programme are:

Community participation and Primary health care, Epidemiology, Services, Education, Training, Emergency response, and Information and Communication.

4.1. The role of community participation and primary health care

To cope on its own during the initial phases primary health care workers and the community must be able to carry out a needs assessment, implement life saving measures, give emergency care and first aid, use triage, and train and educate the population using public relations and other measures to assure community participation. Primary health care workers also have a role in environmental health aspects. Assessment to ensure adequate housing and shelter is also part of their functions.

4.2. Epidemiology

Studies of previous disasters will ensure preplanning based on experience, including the use of methods developed in epidemiology and statistics. Tools particularly necessary are: data bases, community profiles, hazard-mapping, assessment of need protocols and evaluation methodology. Examples of results include:

- the expected ratio of dead:injured following an earthquake;
- projections of medications required based on estimates of populations involved;
- the probability of an outbreak of communicable diseases;
- nutritional needs is slowly developing disasters.

4.3. Services

Health services

The scope of the health sector responsibility as it relates to health aspects therefore includes care at the scene of the disaster, including triage or a system of needs assessment and treatment. In addition, triage is required for evacuation followed by possible referral to hospital services. At this level, drugs, equipment and personnel must be considered.

The management of mass casualties requires advance planning. It includes (a) the training of primary health care workers, other community workers and the general population, in the basic life-saving procedures; (b) the organization of specialized well-trained mobile medical and surgical teams on a stand-by basis; (c) means of transport, both to reach the disaster area and to evacuate the victims, as well as communications, which will require coordination with other sectors of public life (ministries, army, private sector); (d) hospital planning, including organizing in advance a network of mutually supporting hospitals, more needs to be done in relation to chemical and nuclear accidents: (e) coordination between the teams (if there are several) as well as with the authorities in the disaster area; (f) participation of the primary health care workers in the health care activities carried out in the affected community.

Environmental Health Services

This aspect includes social, psychological and physical factors. In the last category, the following are critical: water, food, shelter, sewage and solid waste disposal and toxic substances. Hazard mapping is an important element which can and should be carried out by the local community. Psychological aspects whether affecting victims or rescuers are increasingly being studied.

Transportation

This element refers to both supplies and the evacuation of victims.

Communication

The normal means of communication must be assessed and alternatives must be developed.

4.4. Education

This is an essential element. Many sectors, and importantly the community itself, are involved.

The target population for education in a disaster refers to the whole population: the public, the professional politicians, policy makers, the health sector and other sectors. Consistent messages should be given on real or potential hazards and should be based on sound data and epidemiology. The messages should address the questions: "What can be done by individuals, the community?" and "What can be done by the authorities?". The media must be adequately briefed and be included in education programmes.

4.5. Training

This should be based on the community and apply itself to all health aspects and include all sectors involved. The optimum time for training is during the pre-planning phases where simulation exercises can be repeated to ensure optimum functioning under the severe stress of an actual event.

4.6. Information and communication systems

Information is required for: advance planning of measures for prevention and mitigation of effects; and for preparation and coordination of rescue, relief and rehabilitation and evaluation. It should deal with: potential risks, needs, resources, use of services and evaluation of relief action taken. The information component of preparedness is basic and requires:

(a) the collection of data in advance - a community profile, containing data on geography, socio-economic, environmental, mapping of potential hazards, health status, health services personnel;

(b) the setting up of a mechanism for assessing the needs, to be activated once the disaster has occurred; the same mechanism should be used for collecting data for evaluation;

(c) the study and use of data collected after the disaster to improve preparedness for future disasters.

Data should therefore be collected before the disaster, during the disaster, and in its aftermath, and later when disaster has subsided.

4.7. Emergency response

At the time of an acute disaster, rapid action is needed locally, nationally and internationally. But experience has shown that gaps between local needs and help provided, is varied and often inappropriate. Response must be organized through multisectoral pre-planning and community participation and by developing local expertise within the elements previously described. The emergency response has its own phases, which include: alert, preparation, implementation, rehabilitation and evaluation.

5. SUPPORT OF MEMBER STATES

Although experience has shown that Member States must be self-reliant and cope themselves at the time of a disaster, WHO has the responsibilities from the health protection point of view to enhance national preparedness within a framework of active community participation and primary health care. WHO therefore, developed its own programme. In the European Region for example, the main activities relate to management, with technical aspects being developed within regional programmes - environmental health, mental health, nursing, primary health care.

These are carried out by the development of:

- Guidelines to be used by workers in primary health care, the community and other sectors involved in protection of the health of the community. Subjects include: assessment of need, community participation, environmental health, psychosocial factors and treatment facilities for victims of chemical and radiation accidents.

- Regional courses in disaster preparedness, and national courses in the language of the country. There have been two courses (1985, 1986) and one workshop on management aspects (Trieste, 1984 - Health Aspects of Disaster Preparations: Report of a WHO Workshop, Trieste, Italy, 15-20 October 1984). Further courses are planned on specific topics, e.g. environmental health, psychosocial factors, community participation.

- Information systems which include community profiles and indicators for rapid assessment of health risks and needs both prior to and following a disaster. An assessment of need protocol has been drafted and discussed in several regions of WHO - the African, American and European Regions - with a view to preparing guidelines for Member States.

- Country programmes to help Member States create national plans and mechanisms to ensure disaster preparedness. These are developing, with the help of the Assessors, in Greece, Iceland, Malta, Spain, Turkey and Yugoslavia.

- A task force of trained Assessors.

- A European Office disaster plan to respond immediately and effectively to requests for help by stricken Member States.

6. THE WHO REPRESENTATIVE

At the country level the WHO Representative (WR), the country liaison officer or officer in charge of WHO's programme (in Europe an Assessor) is in a key position to extend WHO technical cooperation to Member States in:

- promoting training programmes and participating in the orientation and training of the national and WHO staff;
- carrying out rapid initial assessment in case of emergencies and disasters;
- participating in meetings and other activities for coordination of emergency preparedness and response;
- coordination of relief operations and securing external assistance if required;
- improving emergency profiles, data bases, information and communication systems;
- programme monitoring and evaluation.

7. COORDINATION

If the objectives of a disaster preparedness programme are to be met, several issues must be addressed through sound planning and management.

Within countries many sectors are involved; information comes from many sources, the epidemiology of disasters is not well known from the behavioural and environmental aspects; education and training is carried out by many sectors; services, including health services, depend too much upon high technology and may not be based on community participation and primary health care.

Health authorities are not responsible for the overall planning and management of disaster preparedness. They usually have the responsibility for all health aspects of a disaster; to ensure the maintenance and the protection of the population, they must be part of the team established locally, regionally or nationally.

Health in this context is much wider than health services, much wider than treatment of victims. It includes care of victims whether primary or secondary, environmental health aspects (safe food, water, sewage disposal, solid waste disposal, toxics), control of communicable diseases, and the maintenance of health services.

The health sector is responsible for the preparedness of the health services themselves and the provision of these services. They will not actually provide the other health elements, but should ensure the inclusion of detailed requirements which will enable the other sectors to plan their inputs.

The traditional and long-standing relationship between the non-profit making bodies and non-governmental organizations in all health matters is very vital in disaster preparedness and management of emergencies.

Internationally, the same problems exist and many agencies are involved. Within the United Nations System, the United Nations Disaster Relief Office is the focal point for overall disaster relief matters. The World Health Organization (WHO) has the mandate relating to health, working closely with inter-governmental and non-governmental organizations and with other UN agencies. There is now a greater emphasis on preparedness.

To take the example of chemical accidents: engineers, psychologists, systems analysts, chemists, toxicologies and health personnel are involved, morbidity and mortality need to be studied, the community must be involved; involvement of the media at all stages is important; harmonization of guidelines, procedures, codes of practice and regulations is required because of trans-boundary problems.

To prepare to meet chemical emergencies then, the community must be educated and informed through messages they can understand. They should be a basic part of the emergency plan. National authorities in evaluating regulation guidelines, codes of practice for the safe operation, transport, storage and handling of hazardous chemicals should involve all sectors including health.

Internationally with regard to the health aspects WHO has a central role in coordinating the work on health and environmental effects of chemical accidents including preparedness. Information exchange is very important and is recognized as fundamental at time of emergencies. A system must be established. This is an integral part of the WHO Emergency Action plan - its success depends upon this.

Although the health section in communities in countries and internationally has this health protection responsibility, it must not be inward looking. For success in disaster preparedness, the health sector must be certain to ensure active participation by the other sectors when preparing and implementing its plans.

8. POST-DISASTER ASSESSMENT

A sample form for assessing the extent of environmental and environmental-health-related damage resulting from a disaster is provided on the following pages.

ENVIRONMENTAL HEALTH SERVICES - POST-DISASTER ASSESSMENT

1. WATER SUPPLY SERVICES

1.1. Damage to water sources	Totally damaged	Partially damaged	Undamaged

(a) Surface water sources

- River
- Natural lake
- Lagoon
- Artificial lake
- Salty marsh
- Water dam reservoir
- Rainwater reservoirs

(b) Groundwater sources

- Hand-dug wells
- Deep-bored wells
- Springs
- River-bank wells
- Artesian wells

1.2. Damage to water network

	Before	Damaged	In function
- Kms piped water network			
- Number of water reservoirs (in network)			
- Number of water treatment plants			
- Primary treatment only			
- Secondary treatment			
- Tertiary treatment			
- Number of pumping stations			
- Total population left without water services.			

1.3. Water quality control services

	Before	Damaged	In function
- No. of water analysis laboratories			
- Laboratory equipment *			
- Laboratory supplies *			

*(Detailed list of essential items to be provided).

1.4. Type of water analysis needed after the disaster

- Physico-chemical _____
- Physico-chemical and biological _____
- Biological only _____
- Estimated no. of portable lab kits required (Specify type of kit) _____
- Estimated no. of water purification Units (Assess capacity of units) _____
- Chlorine and/or ozone tablets needed _____

1.5. Potential sources of water contamination (Post-disaster)

- Domestic sources: Wastewater _____
  Solid wastes _____
- Animal sources _____
- Agrochemicals _____
- Industrial pollution _____
- Power plants effluents _____
- Radioactive substances _____
- Accidental spillage (transport) of hazardous substances _____
- Damage to stores of chemicals: _____
  Provide name of principal pollutant and assess extension of contamination

2. WASTEWATER DISPOSAL

2.1. Sewage network	Before	Damaged	In function
- Kms piped sewage network			
- No. of wastewater treatment plants			
Primary treatment only			
Secondary treatment			
Tertiary treatment			
- No. of special industrial wastewater treatment plants			
- No. of pumping stations			
- Population left without adequate services.			

2.2. Other methods of excreta disposal

- Latrines
- Septic tanks
- Night-soil buckets
- Others

2.3. Risk of environment contamination with wastewater

(a) Damage to effluents of wastewater treatment plants _____

(b) Damage to the piped sewage network _____

(c) Damage to effluents from special industrial wastewater treatment plants _____

(d) Risk of drinking-water contamination as a result of temporary wastewater disposal installations in temporary shelters _____

2.4. Wastewater quality control services	Before	Damaged	In function
- No. of control laboratories			
- (if different from water labs)			
- Laboratory equipment*			
- Laboratory supplies*			
(*Detailed list of essential items to be provided)			

3. SOLID WASTE DISPOSAL SERVICES

3.1. Collection	Before	Damaged	In function
- No. of garbage collection trucks			
- No. of street garbage containers			
- No. bulldozers			
- No. cranes			
- No. compactors			

3.2. Disposal

(a) Composting plants
(b) Incineration plants
(c) Land sanitary fills

_____

3.3. Population affected

Total population left without adequate services. _____

3.4. Risk of environment contamination with solid wastes

(a) Risk of infiltration of pollutants into aquifers resulting from earth cracks produced by the earthquake _____

(b) Pollution of surface waters (toxic matters from land-fills carried away after earth movements) _____

(c) Drinking-water contamination as a result of the installation of temporary solid waste disposal facilities built around temporary settlements _____

4. HOUSING

(a) Estimated number of homeless persons _____
permanent shelters - outside the area _____
- within the area _____

(b) Number of persons accommodated in temporary shelters _____

(c) Estimated time-duration needed for shelter _____

(d) Are the basic human needs facilities provided adequate? (Water, excreta disposal, wastes disposal, bathing, washing, cooking, etc.)? _____

(e) Is the location of temporary shelter adequate (in relation to distance from health-care services? _____

(f) Are transport facilities adequate (from shelter to working place, school, etc.)? _____

(g) Has the assessment of damage level to buildings been completed using standard UN damage classification? _____

(h) Has an estimation of the value of earthquake-induced damage to housing been effected? _____

(i) Are basic principles of planning in earthquake-prone areas being taken into consideration in the reconstruction plans? _____

5. FOOD SUPPLIES AND HYGIENE CONTROL

5.1. Estimated damage to food

		Stock Before	Damaged	Needs
(a)	Wheat			
(b)	Corn			
(c)	Milk			
(d)	Meat			
(e)	Beans			
(f)	Sugar			
(g)	Coffee			
	etc.			

5.2. Damage to food stores or food production industries

(a) Silos
(b) Granaries
(c) Slaughter houses
(d) Markets
(e) Food industries (canned food, etc.)
(f) Frozen food stores
(g) Food distribution units (milk, meat, etc.)

5.3. Food contamination risk

(a) Food hygiene patterns (present situation)

Good _____
Medium _____
Low _____
Bad _____

(b) Food quality control

	Stock Before	Damaged	In function
- No. of laboratories (if different to water labs)			
- Equipment			
- Supplies			

6. ENVIRONMENTAL HEALTH MANPOWER LOSSES

		Before	Losses	function
(a)	Environmental or sanitary engineers			
(b)	Chemical engineers			
(c)	Mechanical engineers			
(d)	Toxicologists			
(e)	Veterinaries			
(f)	Laboratory technicians			
(g)	Food inspectors			
(h)	Public health inspectors			
(i)	Water treatment plant operators			
(j)	Sewage treatment plant operators			
(k)	Crane/bulldozer operators			
(l)	Other			