The World Health Organization is a specialized agency of the United Nations with primary responsibility for international health matters and public health. Through this organization, which was created in 1948, the health professions of some 165 countries exchange their knowledge and experience with the aim of making possible the attainment by all citizens of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life.

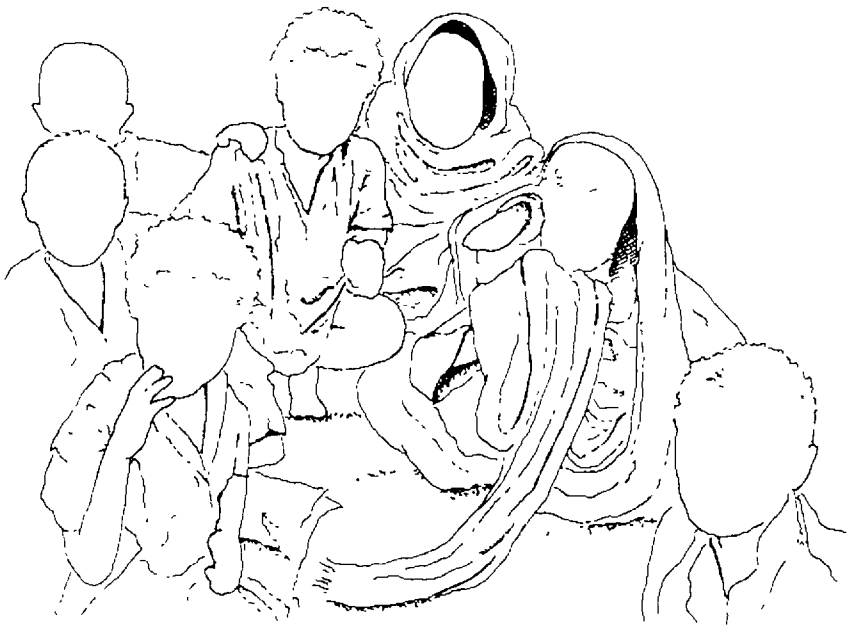
By means of direct technical cooperation with its Member States, and by stimulating such cooperation among them, WHO promotes the development of comprehensive health services, the prevention and control of diseases, the improvement of environmental conditions, the development of health manpower, the coordination and development of biomedical and health services research, and the planning and implementation of health programmes.

These broad fields of endeavour encompass a wide variety of activities, such as developing systems of primary health care that reach the whole population of Member countries, promoting the health of mothers and children, combating malnutrition, controlling malaria and other communicable diseases including tuberculosis and leprosy, having achieved the eradication of smallpox, promoting mass immunization against a number of other preventable diseases, improving mental health, providing safe water supplies, and training health personnel of all categories.

Progress towards better health throughout the world also demands international cooperation in such matters as establishing international standards for biological substances, pesticides and pharmaceuticals, formulating environmental health criteria, recommending international nonproprietary names for drugs, administering the International Health Regulations, revising the International Classification of Diseases, Injuries, and Causes of Death; and collecting and disseminating health statistical information.

Further information on many aspects of WHO's work is presented in the Organization's publications.

Coping with natural disasters: the role of local health personnel and the community



Coping with natural disasters: the role of local health personnel and the community

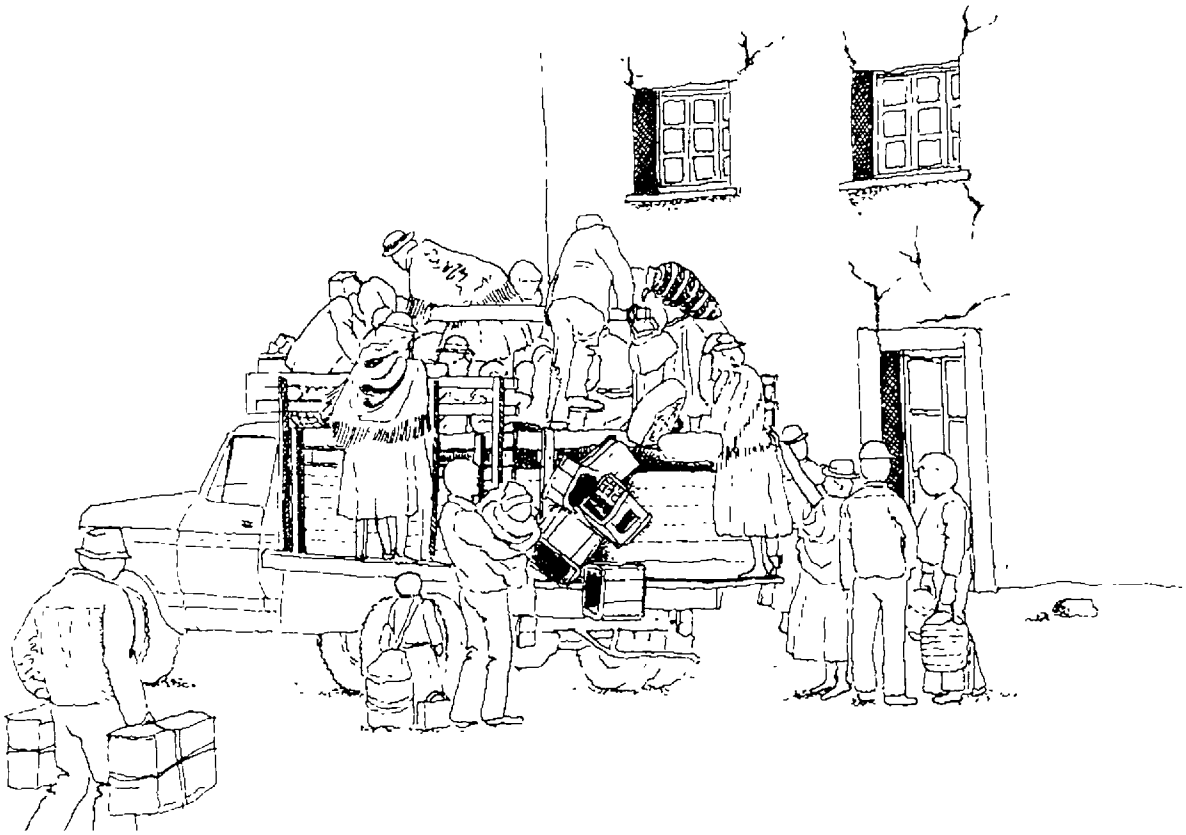
World Health Organization
Geneva
1989

ISBN 92 4 154238 1

Printed in Belgium
88/7790 — Vanmelle — 7000

Contents

ANNEXES



Acknowledgements

This publication could not have appeared without the valuable assistance of Dr Luciano Carrino, Health Department, Cooperation in Development, Ministry of Foreign Affairs, Italy, who drafted and reviewed the various versions. Dr S. William Gunn launched the publication when he was in charge of WHO's Emergency Relief Operations (1977–1984); he also reviewed the final text in his capacity of Scientific Vice-President of the European Centre for Disaster Medicine.

WHO also wishes to thank Ferruccio Ferrigni and Patrick de Maisonneuve for their contributions on architecture and town planning; Teresa Volpe who prepared the original drawings, Giulia Dario for her advice on community action; Guido Bertolaso, Marta di Gennaro, Guglielmo Riva, Enzo Lucchetti, Carol Djeddah, Agostino Miozzo, Giancarlo Samaritan and the health team of the Department for Cooperation in Development of the Italian Ministry of Foreign Affairs, for information and documentation on emergency health action, Adriano Mantovani for his contribution on veterinary medicine; José Luis Zeballos, Dorothy Blake, José Maria Paganini, Marc Parent, Don Washington, Luis Jorge Perez, Carmen Bowen-Wright, Miguel Gueri; the University of Louvain's Disaster Epidemiology Team led by Michel Lechat; the participants in the WHO meetings on health activities in the event of disasters held in Rabat (1981), Trieste (1984), Ankara (1985), Brazzaville (1986) and Marrakesh (1986); and all the other experts consulted.

Thanks also go to the teams in health centres/local hospitals at Giugliano (Italy), Ayapel (Colombia), Port Antonio (Jamaica) and Diré (Mali) who allowed us to field-test various parts of this manual.

Finally, acknowledgements are also due to the Campania Region and to the International Centre for Research-Intervention in Naples, which provided organizational support.

The following members of staff of WHO and the League of Red Cross and Red Crescent Societies (LORCS) also collaborated in this publication: Thomas Bergmann (LORCS), Claude de Ville de Goyet (WHO/Pan American Health Organization), Olavi Elo (WHO), Concetto Guttuso (WHO), John Jones (WHO), Andrei Kisselev (LORCS), Sten Kistner (LORCS) and Michael Tailhades (LORCS).

This Guide is in three parts:

- The first part deals with rescue work and emergency care immediately after the disaster has struck
- The second deals with action to be taken when the acute period of the disaster is over.
- The third describes what can be done at local level to prevent and mitigate the consequences of disasters

Each part consists of two chapters:

- The first describes what the community can do.
- The second describes what the local health personnel can do.

But the action of the community and that of the local health personnel are closely linked. In disaster situations, the local health personnel sometimes need to act as a referral point for the population, to solve problems relating to survival or to the general organization of the community.

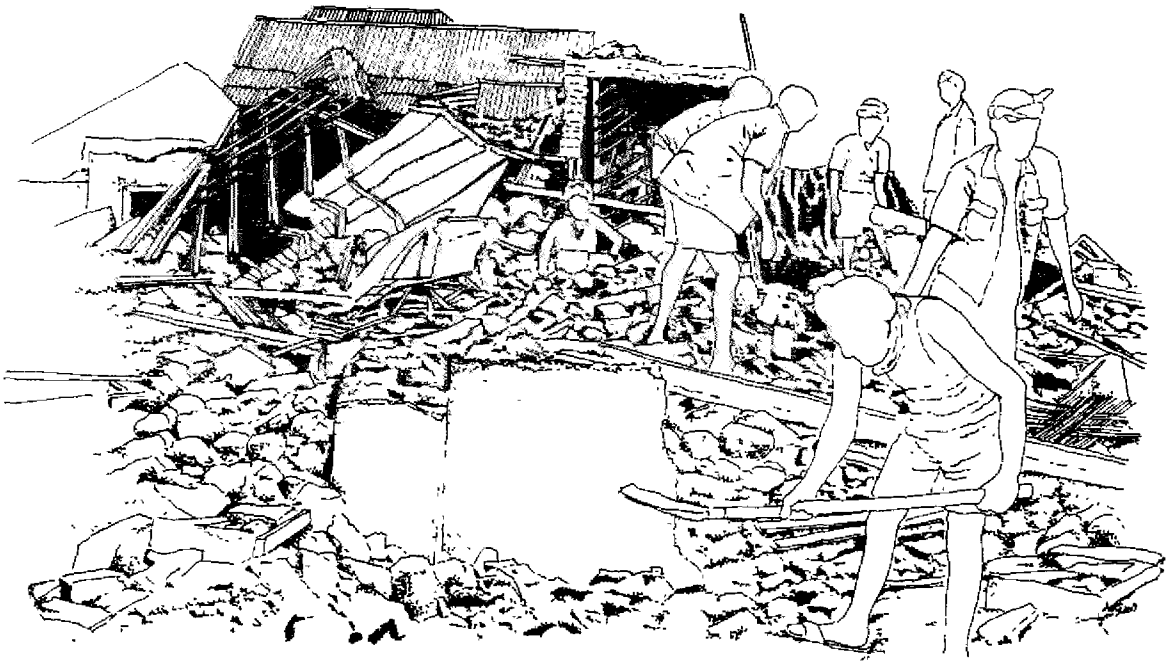
Introduction

An active role for communities and their health personnel

It is usually assumed that in emergency only national governments and international agencies can mobilize the resources needed to deal with the situation.

Various countries set up systems for protecting the civilian population in the event of disaster that are based on central state authorities and make use of the latest equipment and technology. It is also certain, however, that the local communities have an active part to play before and after disasters:

- because a good state of preparedness before a disaster strikes may reduce its impact,
- because the greatest number of lives can be saved during the first few hours after a disaster has occurred, before help arrives from elsewhere,
- because the numerous problems of survival and health resulting from a disaster are dealt with more efficiently if the community is active and well organized



The purpose of this Guide is to help local communities and their health personnel cope with the consequences of disasters, particularly natural

disasters such as earthquakes, volcanic eruptions, floods, hurricanes, gales, tidal waves and droughts. It is intended for relatively small communities with scanty resources, in which there is a health centre or local hospital and where the local health personnel consists of a small team, including at least a physician or trained nurse.

Since it focuses on local action, the Guide might give the impression that a community can be self-sufficient in the event of a disaster. On the contrary, it must not be forgotten that a large number of problems can be solved only through outside assistance at various levels:

- the intermediate level: the nearest and best-equipped urban centres,
- the national level: the government and national bodies, including non-governmental organizations,
- the international level: international organizations and other countries.

However, an active and well-organized community will help to improve the quality of outside assistance and reduce the shortcomings often recorded, such as lack of information, poor evaluation of requirements and inappropriate forms of aid.

Two groups are envisaged that will take action in the event of a disaster:

- the local health personnel,
- the community: local authorities and persons or groups who concern themselves in the localities with rescue work, communications, transport, shelter and food supply.

The communities and local health personnel for the most part improvise their organization for meeting the emergency situation following a disaster.

The aim of this Guide is to encourage them to prepare beforehand, particularly in high-risk areas, for setting up the community's organization for dealing with disasters.

This is not just one more burden for already overburdened people and teams. Emergencies bring to light in an acute and extreme way things that in the day-to-day life of the community and in the functioning of the health services may long remain inapparent: lack of coordination, gaps in communication and information, unsatisfactory relationships between services and the population, inflexibility of the health services, a failure on their part to adjust to requirements, their poor territorial distribution and excessive concentration on hospital facilities, and many other shortcomings. On the credit side emergencies also reveal valuable professional and human capacities and qualities which in the normal course of events are not clearly apparent and are not put to use. In short, because they make it absolutely essential to find quick and effective solutions for dramatic problems, disasters at the same time throw into relief the deficiencies and potentialities of the services. Ensuring disaster-preparedness largely consists in improving the quality and effectiveness of existing community services: the prospect of possibly having to face up to an emergency serves rather to bring to general attention many

essential and priority questions that concern the community's health and life even under normal conditions.

The local population stricken by a disaster should be considered as taking action for itself, not as having action taken for it. This presupposes a fundamental change compared with the usual notion that the responsibility of caring for a disaster-stricken community should be entirely taken over by outside assistance and the State authorities. This notion is based on preconceived ideas: people panic and flee without regard for others, some of them will be bewildered or act impulsively, others will remain numb or stupefied; local organizations will be disorganized and unable to act effectively, there will be antisocial behaviour and looting. However, experience of disasters shows that the ways in which people really behave differ greatly from these stereotyped ideas. Cases of panic are generally localized and short-lived The majority of people prefer to stay in the threatened area and generally take steps to protect their families and themselves. Indecision is usually due rather to the poor circulation of information than to panic. Those stricken by the disaster usually react in a positive way and busy themselves quickly and spontaneously, together with their families, friends and groups, in rescue operations. Looting and certain types of antisocial behaviour (exorbitant prices, for example) have been exaggerated (or are perpetrated by people from outside the community) Conflicts and class differences may die down and a sense of community solidarity not ordinarily present may develop. Local communities, if they are not discouraged and made passive, react quickly and effectively, particularly if they are supported (but not overrun or supplanted) by assistance from outside.

PART I

The disaster

Every catastrophic event has its own special features. Some can be foreseen several hours or days beforehand, as in the case, for example, of cyclones or floods. Others, such as earthquakes, occur without warning. Whatever the type of disaster, for some hours the community and local health personnel have only themselves to rely on before outside assistance arrives. In a later chapter, this Guide will deal with organizing the community to manage the consequences of the disaster. Here it will confine itself to describing the steps to be taken by the community and the local health workers to carry out rescue work and provide emergency care immediately after the disaster has struck.

Chapter 1

Community rescue operations

Fear

In most cases, despite their fear, people tend of their own accord to give assistance to their family, their neighbours and their friends and to take the injured to the health centre or local hospital. In the hours that follow, particularly when the danger persists, fear must be countered by issuing certain items of information or instructions (by using loudspeakers and mobilizing volunteers):

- what to do to be safe,[1]
- information on the evolution and consequences of the disaster,
- where to obtain information on the scattered members of the family,
- information on essential matters water, shelter, food, etc.

The dissemination of this type of information is one of the first tasks of the Emergency Committee[2] which the local authority sets up immediately and which remains in permanent session to coordinate local action and information.

Generally, perceiving that the community is acting in a coordinated manner and that information is being circulated gives people a feeling that the situation is under control and in that way helps to control fear.

Panic

Panic is not a common reaction. It may occur when the disaster finds people crowded in an enclosed space (a place of worship, a cinema, etc.). In some cases instructions given over a loudspeaker (asking people to be calm, indicating where the exits are) may help to reduce the adverse effects of panic.

Rescue operations

A disaster may result in people being:

- trapped under the ruins of buildings that have collapsed,
- buried under mud or landslides,
- cut off by floods or the blockage of communication routes

[1] Instructions will vary according to the type of disaster See Part III and annexes
[2] See Part II, Chapter 3.

These people must be reached and rescued. The rescue work will mostly be carried out spontaneously by relatives, friends and local volunteers.

Often it is essential to have available:

- ladders,
- ropes,
- heavy gloves,
- spades,
- picks,
- planks,
- pocket torches.

Groups of volunteers must be organized to reach families that live in isolated places

Certain elementary rules must be observed:

- Do not trample over ruins.
- Do not move rubble before being sure of not causing further collapses of buildings or falls of material.
- Use manual methods for preference and handle spades and picks very gently and cautiously.

When it is difficult to reach a victim or when there is a risk of further caving-in, it is advisable to leave the work of extrication to experts (firemen, trained volunteers, building workers, the army, etc.). As soon as the rescuers reach an injured person, they should be careful to:

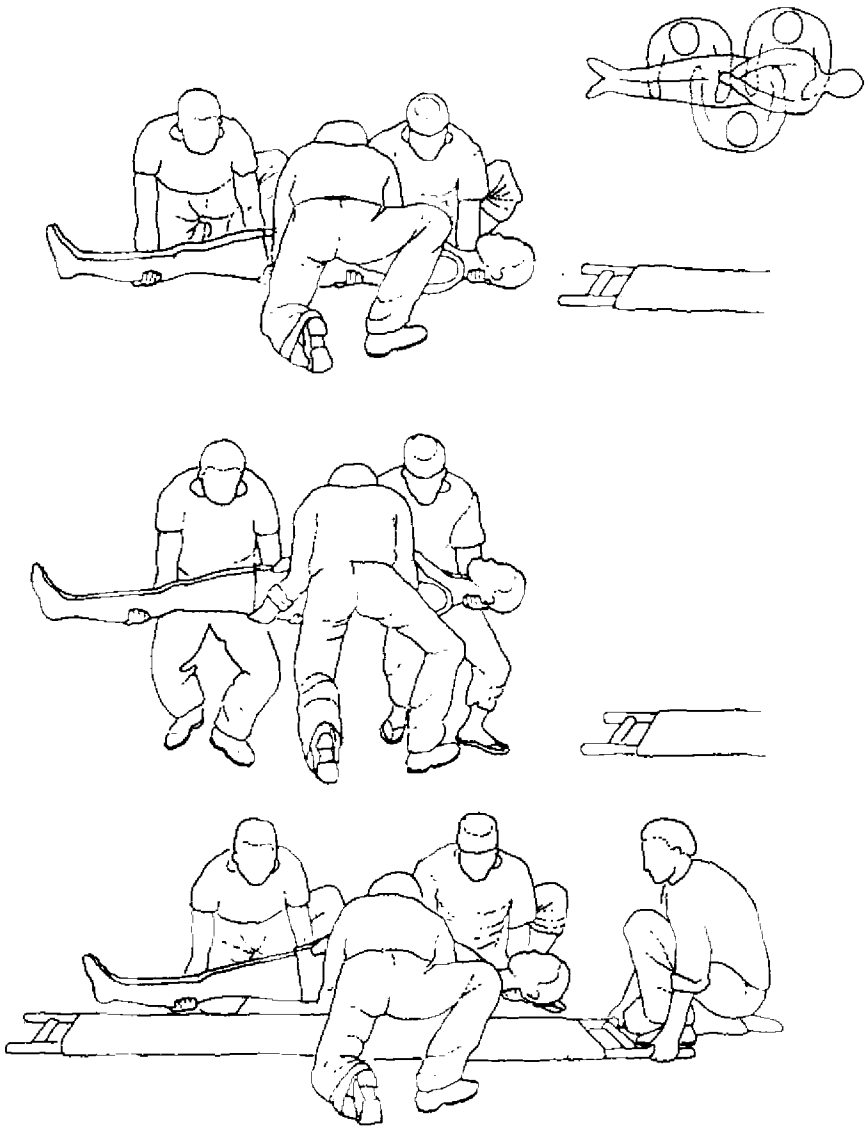
- Maintain and ease respiration.
- Clear the victim's airways by using fingers to clean the mouth and throat, taking out dentures and loosening collars, belts and clothing.
- Use blankets to prevent the victim catching cold.

In order to locate those trapped under the rubble, an attempt must be made — with the help of those nearby or in the same building — to determine the number of people trapped and the places where they are probably to be found (stairwells, cellars, ramps, etc.). To find them, it is necessary first of all to obtain absolute silence and then to shout to them from different points in the ruins If no response can be obtained, signals must be made, for instance, by knocking on pieces of metal pushed down into the rubble or by using loudspeakers. In the event of a response, contact must be maintained. The link with the person discovered is important it is essential to talk to him and give him confidence. While the rescue workers are freeing the trapped person, those responsible for transporting him or her to the health centre or hospital will be preparing the stretcher.

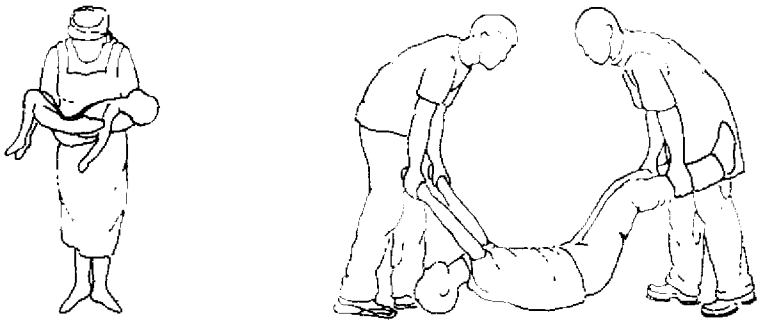
The *stretcher* must be put down near the injured person. If no stretcher is available, one can be improvised with blankets, pieces of cloth or plastic, camp beds, ladders, doors, shutters, etc.

When *lifting* the injured person, certain rules must be followed:

- Movements must be calm and coordinated and carried out in accordance with the instructions of a rescue worker
- The injured person must be moved as little as possible
- The victim's head, neck and trunk must be kept in the same axis (see figure).



CAUTION:
Do not carry like this!



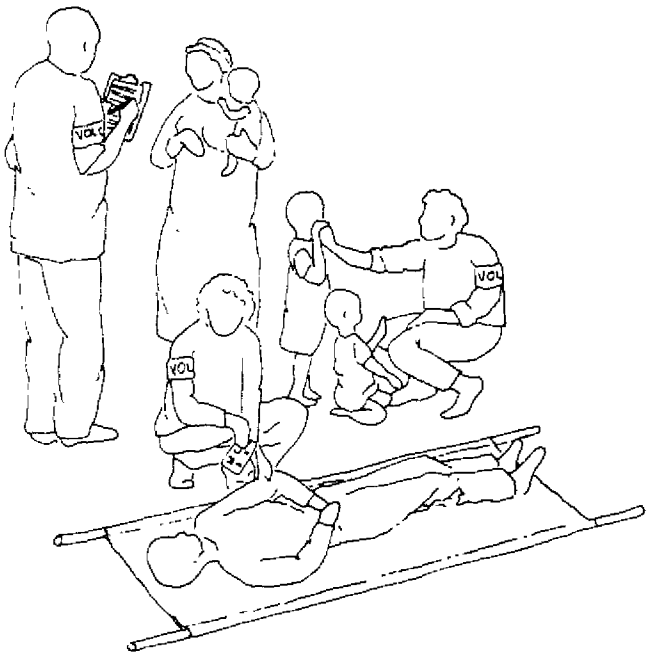
Conveyance by stretcher to the local health establishment must follow certain simple, common-sense rules:

- The stretcher must go forward with the patient's head foremost.
- Jerkiness must be avoided (no sudden stops, bumps or tilting).
- No stretcher-bearer should walk backwards
- The injured person, together with any ventilation equipment, must be fastened to the stretcher
- If the victim is given artificial respiration (mouth-to-mouth, mask) the rescue worker responsible for it will get between the two shafts level with the victim's head; it is only in such a case, to avoid the rescue worker having to walk backwards, that the injured person will be transported feet first.

Reception at the health centre or hospital

The volunteers assisting the local health personnel organize the reception of the victims and those accompanying them at the health facility. It is essential to:

- Speak to those arriving, answer their questions and tell them where they can put themselves.
- Give them blankets if they are cold.
- Help them wash if necessary (people extricated from the rubble, people covered in mud, etc.) and give them tea or coffee
- Look after the children.
- Help scattered families to reunite or communicate.
- Identify the injured, giving priority to whose who are unconscious or are not accompanied by members of their families The name of the injured person and the place he or she was brought from will be noted on a sheet of paper, which will be placed in a plastic cover, for example, and attached to the person concerned. When the victim's name is not known, a note must be made of the information supplied by the rescue workers, which can later make identification easier (place where the victim was found, the circumstances, other persons present, etc.)



Chapter 2

The tasks of the local health personnel

Organizing the health centre or hospital to meet the emergency

As soon as possible after disaster has struck, all local health personnel should report to the health establishment where they usually work. The first task is to assess quickly any damage suffered by the establishment and its health facilities and to decide whether it can still be used or whether it would not be better to move its operational base to a less damaged building or to a temporary shelter (tent or other). If a move is necessary, a new health centre or hospital will quickly be established, use being made of any health equipment and material it has been possible to salvage.

Experience shows that during the first few hours it is above all relatives, friends and local volunteers who bring the injured to the health establishment. Preparations to receive them must be made by setting aside a space where the local health personnel can screen them to determine what care they require, while the volunteers concern themselves with receiving them on arrival.

When there are enough local health personnel to receive the injured at the health establishment, one or more health posts can be established where rescue work is being undertaken and at which first aid can be given to the rescued before they are carried to the health centre or hospital.

The local health personnel can also act before a victim is extricated, for example by applying a tourniquet when the person concerned has had a leg or arm crushed or has lost all feeling in fingers and toes (thus preventing the "crush syndrome").

Triage

When a large number of injured people are brought at the same time to the health establishment, the more expert among the local health workers, taking into account the equipment and professional skills available, must sort the cases into the following categories:

A. Those who must be sent urgently to the nearest properly equipped hospital. Among these two orders of priority may be distinguished.

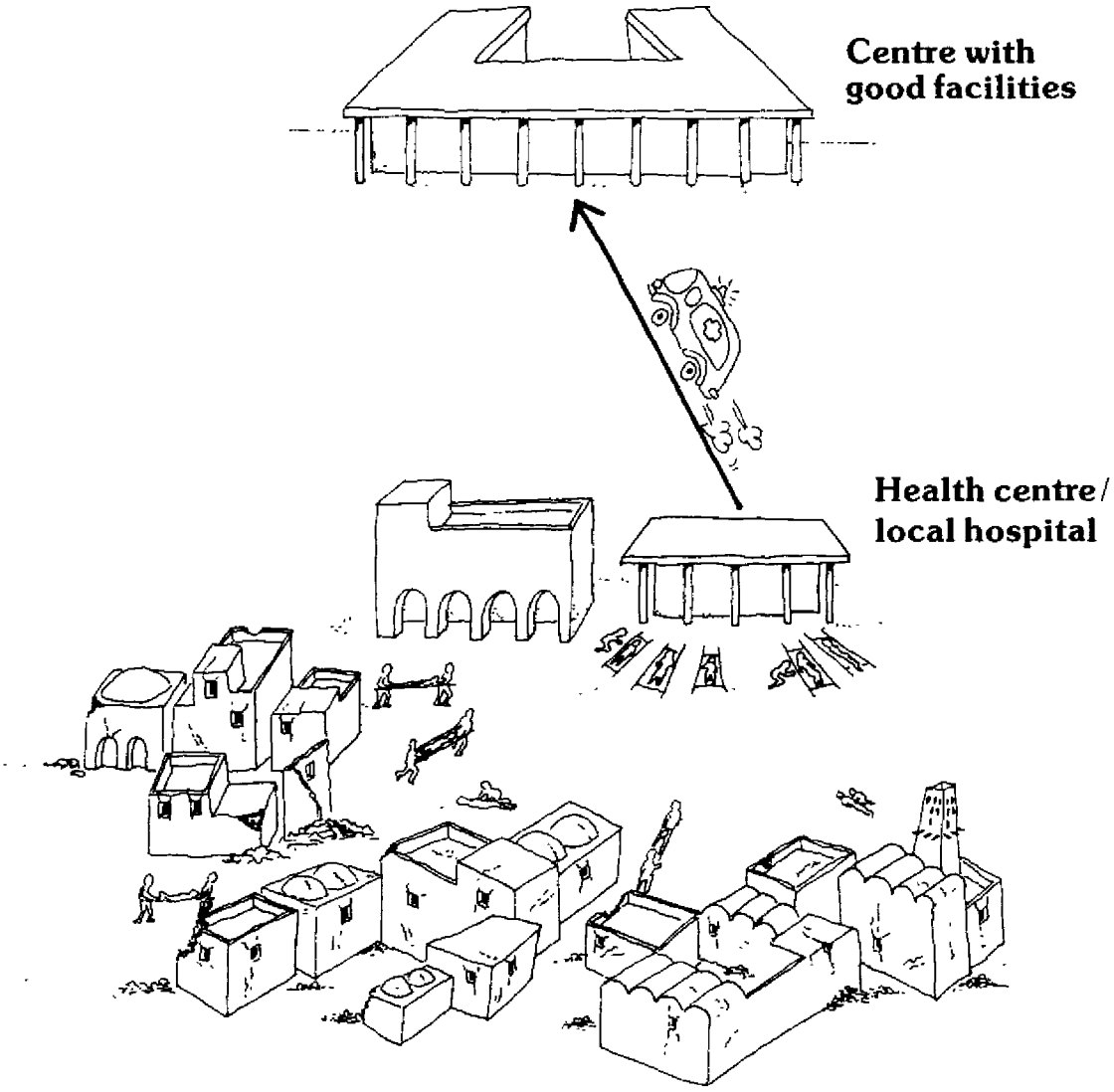
A.1. Emergency cases that must be operated on within the hour:

- acute cardio-respiratory insufficiency,
- severe haemorrhages,
- internal bleeding,

- rupture of the spleen,
- injuries to the liver,
- severe chest lesions,
- severe cervico-maxillary lesions,
- states of shock,
- severe burns (over 20%),
- skull injuries with coma.

A.2. Emergency cases in which it is possible to wait a few hours before operating:

- ligatured vascular injury,
- intestinal lesions, severe haemorrhage or shock,
- open joint and bone injuries,
- multiple injuries with shock,
- injuries to the eyes,
- extensive closed fractures and dislocations,
- less severe burns,
- skull injuries without coma.



B. Those given attention on the spot. Priority is given to the most serious cases among those with a chance of surviving: there are those who are attended to while waiting to be sent to a specialized centre and those who do not need major medical care and can be treated on the spot. The B group also includes very serious cases with no chance of survival that it would be pointless to move.

Victims can be transported from the local health establishment to a better-equipped hospital by local means of transport or, later, by means of transport (ambulances, cars, helicopters, ships, etc.) from elsewhere. The people in the community or from outside who deal with transport must know what hospitals can receive the injured. This information must be given to the community by the authorities at intermediate level or the national authorities. The local health personnel must also be prepared for the possibility of all communications being cut and being forced for a certain time to rely solely on their own resources and professional skills.

Emergency care

In many cases the local health personnel do not have available the specialists and resources needed after a disaster to treat all emergency cases on the spot. Often they are forced to confine their efforts to screening the victims and providing care for those who are able to survive without major medical assistance. In every instance the local personnel must be trained to receive the following medical emergencies:

- haemorrhages,
- cardiovascular failure,
- respiratory distress,
- states of shock,
- skull injuries,
- fractures,
- dislocations,
- burns,
- exposures to toxic substances,
- electrocution,
- drownings,
- cases of accidental hypothermia

The types of emergency vary according to the kind of disaster and how and when it strikes.

In *earthquakes* there is a high level of mortality as a result of people being crushed by falling objects. The risk is greatest inside or near dwellings but is very small in the open. Consequently earthquakes at night are more deadly. There are large numbers of injuries During the night fractures of the pelvis, thorax and spine are common because the earthquake strikes while people are lying in bed. In the daytime injuries to the arms and legs, the collarbone and the skull frequently occur. There may be people in a state of shock and people suffering from burns (particularly in areas where electricity and gas are installed). Afterwards there may be surgical complications of fractures or infections of wounds.

In *volcanic eruptions* mortality is high in the case of mudslides (23 000 deaths in Colombia in 1985) and glowing clouds

(30 000 deaths at Saint-Pierre in Martinique). There may be injuries, burns and suffocations.

In *floods,* mortality is high only in the case of sudden flooding: flash floods, the collapse of dams or tidal waves. Fractures, injuries and bruising may occur. If the weather is cold, cases of accidental hypothermia may arise.

In *cyclones* and *hurricanes* mortality is not high unless tidal waves occur. The combined effect of wind and rain may cause houses to collapse. A large number of objects may be lifted in the air and carried along by the wind. This may give rise to injuries, fractures, cuts and bruises.

In *droughts,* mortality may increase considerably in areas where the drought causes famine, in which case there may be protein-calorie malnutrition (marasmus, kwashiorkor) and vitamin deficiencies (particularly vitamin A deficiency leading to xerophthalmia and child blindness). In famine conditions measles, respiratory infections and diarrhoea accompanied by dehydration may bring about a massive increase in infant mortality. When people migrate and settle on the outskirts of towns and villages, poor hygiene and overcrowding may facilitate the spread of endemic communicable diseases (diarrhoeas, tuberculosis, parasitic diseases and malaria).