SOMALIA

CASE STUDY OF THE CHOLERA EPIDEMIC IN THE NORTHERN REGION, MARCH-APRIL 1985

A.R. Haji, A.H. Mohamed, A.R.M. Husein

1. INTRODUCTION

Somalia is situated in the Horn of Africa between latitudes 12° 0' North and 1° 35' South, and between longitudes 41° 0' West and 51° 25' East. The total area of Somalia is 63 800 square kilometres of which about 13% is suitable for cultivation, 45% for raising livestock and the rest is non-agricultural land. It has a coast-line of nearly 3330 kilometres. There are two rivers, the Juba river which is 800 kilometres long and the Shabelle river which is 1100 km long. Somalia, being situated on the equator, has an arid and warm climate with average daily temperatures ranging from 25°C to 35°C. The average annual rainfall is less than 600 mm in most of the country. Only the inter-riverine areas receive more than 600 mm. There are two rainy seasons, April-June and October-November. The southern coast gets rain also during July-August. The humidity in the country varies from 65% in the dry season to 82% in the wet season.

2. THE CHOLERA EPIDEMIC IN THE NORTH-WEST REGION

2.1. The refugee influx

The number of refugees arriving in north-west Somalia from Ethiopia continued without let-up through the end of 1984 and into the first months of 1985. A temporary camp was opened at Bixing Duule (between Berbera and Sheikh) in September, 1984, and over 35 000 refugees were moved there from the outskirts of Hargeisa, where they had been camping at Gannet.

In mid-February, those refugees who had collected at Gannet since September were registered. Over 20 000 where found to be camped there at that time. Since Gannet was not set up as a refugee receiving area, the refugees there did not have access to an organized water supply and there were no sanitation or health facilities provided for them. The crude shelters they put up were of their own making, fashioned mostly from pieces of cloth, old bags, cartons, and sticks.

2.2. The origins of the cholera

Cholera had not been seen in north-west Somalia since the early 1970s. The first cases of cholera-like illness seen during this epidemic were amongst newly-arrived refugees from Ethiopia. On March 22 a ten-year old girl came to the feeding centre/clinic with fulminant diarrhoea and vomiting and severe dehydration. The girl had arrived three to four days earlier from the Jigjiga area of Ethiopia. Although she recovered rapidly following rehydration, similar cases appeared over the next few days and the first adult deaths were registered. The number of cases increased alarmingly towards the end of March and this began to suggest that it was probably cholera itself, rather than a cholera-like gastro-enteritis. When laboratory analysis became available, culture confirmed the presence of *Vibrio cholerae* on March 30, also in a refugee newly-arrived from Ethiopia. Refugees were prevented from moving to

Gannet when the epidemic was officially declared and another group of new arrivals from Ethiopia began to accumulate at a site close to the border crossing-point, at Tug Wajale. An investigating team was sent to this area from the cholera control office on April 5. Three families which had arrived within the last three days were identified. Among these, six cases of diarrhoea were found. A set of cultures from a family of three from the Jigjiga area were subsequently confirmed as positive for *Vibrio cholerae*.

2.3. Spread of the disease around the north-west

The official announcement of the cholera outbreak in Somalia was made by the Minister of Information on March 31. This was combined with an announcement that Hargeisa was to be sealed off to prevent spread of the illness. However, by then there had already been much dissemination of contacts, and cholera cases were reported within a few days in most of the other refugee camps in the north-west. All the cases at this early stage were shown to have had contact with Gannet.

2.4. Cholera control activities - the three phases

(a) Controlling the Gannet epidemic

This was the real emergency phase, when the very rapid spread of the disease in the Gannet settlement area initially swamped the medical facilities and staff available. Massive mobilization of staff from national and international sectors, as well as emergency shipment of vital supplies, was required to control the very high case and death rates.

(b) Mobilization of existing health service infrastructure to limit the spread of the disease

The potential for spread of the epidemic was enormous, since the Gannet settlement was right inside the boundary of Hargeisa town (population 300 000); many Gannet residents had been begging for food or water daily in Hargeisa. Similarly, several hundred thousand refugees in the other camps were brought into potential contact with the disease as Gannet residents travelled to other camps.

(c) Control of the refugee influx

Fortunately, an experienced and well organized health service infrastructure was already in place in the north-west consisting of the active MOH Primary Health Care programme, supported by UNICEF, and an excellent Refugee Health Unit (RHU) network in the camps. These structures were rapidly mobilized with support from the Regional Medical Office. There is no doubt that it was this factor that was mainly responsible for limiting the extent of the epidemic.

2.5. The Gannet epidemic

2.5.1. *Epidemiology of cholera in Gannet and summary of medical interventions*

The first suspected case of cholera in Gannet occurred on March 22. Clinical care was sought for a ten-year old girl who had arrived three or four days previously from the area around Jigjiga, Ethiopia. She was dehydrated from vomiting and diarrhoea. Intravenous rehydration was required

but suspicion that her illness might be cholera was reduced when she recovered completely within a day, after hydration only. Although many deaths had occurred throughout March in Gannet (up to seven per day), none were characterized by rapid dehydration and death from profuse diarrhoea and vomiting. No reports of cholera across the border in Ethiopia had been received by the medical staff. Some had heard the single BBC reports three to four months previously of cholera in refugees near Walla (North of Addis Ababa) but cholera in Ethiopia had not been announced officially and no one was aware that outbreaks had occurred across the border from the North-west Region.

The cases were characterized by profuse watery diarrhoea and vomiting leading to dehydration. No fever, abdominal tenderness or blood in the stools were observed. The profuse vomiting made oral or nasogastric rehydration impossible in the first hours of the illness. Many patients were admitted with severe dehydration. Intraperitoneal infusions were resorted to in some children when intravenous catheters could not be inserted. Facilities for cutdowns and central catheters were not available and would not have been appropriate given the physical setting and medical staffing. Death occurred in some within four to six hours of the first sign of illness.

Over the next three days, more than a thousand cases of clinical cholera occurred. The existing clinics and medical staff of the RHU and Save the Children Fund were quickly overwhelmed by the number of cases and the need for vigorous intravenous and oral rehydration. Additional RHU, Ministry of Health, and expatriate medical staff volunteers were recruited from Hargeisa (and later from the rest of Somalia and the International Medical Community). Many large tents within Gannet were soon filled with seriously dehydrated patients. On March 29, a system began whereby serious cases were transported by lorry to an isolation tent area about two kilometres from camp. The frequency of lorry loads increased and the isolation tent area grew steadily over the next ten days to a total of 95 tents.

On March 30, the first stool cultures were taken which established the pathogen as *Vibrio cholerae*, Ogawa serotype, susceptible to both tetracycline and cotrimoxazole. Tetracycline therapy was started for patients and accompanying relatives although the profuse vomiting and the difficulty of providing adequate hydration therapy to huge numbers of patients prevented consistent tetracycline therapy in the isolation tents before April 2. Disinfection of the area with lime and cetrimide or chlorhexidine was begun on March 30.

2.5.2. Other important control measures

- Increased water supply (from less than 1 litre per person to 7-8 litres). Many new tanks were brought into the camp. However, it was not possible to prevent dipping into water from the tankers by refugees despite security precautions;
- Chlorination of the water supply;
- Continued augmentation of the medical staff in numbers and training;
- Searching of the sections for cases and active referral to the isolation tents for care.

2.5.3. Causes of initial high mortality

The case fatality rate of patients admitted to the isolation camp tents in Gannet between March 26 and April 30 was approximately 22%. This includes

deaths from late sequelae of severe dehydration such as pneumonia and renal failure. This high rate differs markedly from that seen in other areas during the same outbreak and may be attributed to:

- the explosive nature of the epidemic;
- lack of warning;
- poor facilities;
- low resistance of the population;
- lack of social organization;

2.6. Public health measures

Following the announcement of the cholera epidemic in Gannet, on March 31, the National Committee for the Emergency, working through the Regional Committee, instituted the following public health measures:

(a) Restriction of movement: Hargeisa town was officially declared a quarantine area. All flights were stopped. No travel was allowed out of the town without security clearance (given only to essential services personnel initially) and health clearance;

(b) Banning of large public gatherings such as cinema and theatre and closure of schools;

(c) Banning of the sale of fresh fruit and vegetables;

(d) Banning of the taking of water from the central tank for any purpose.

2.7. Health services strategy

Since the factors listed above made it likely that contacts with the disease were already widespread within the town when the epidemic was made public, the health services strategy was necessarily one of active surveillance, rapid isolation of cases, prophylaxis of contacts, and health education. Fortunately, the primary health care programme (North-west) had been involved in mobilization of the town community through the party structure in the two months leading up to the epidemic, for the purposes of mass vaccination against measles, polio, whooping cough, diphtheria, tetanus and tuberculosis. The knowledge and contacts resulting from this successful campaign enabled the regional team to rapidly plan and implement a cholera control programme at the community level in conjunction with the Regional Medical Office, and the District Party Offices. The following were essential elements of the strategy:

- strengthening of the reporting system;
- orientation training of the staff;
- home visit protocol;
- laboratory support;
- monitoring;
- health education/information;
- dam isolation hospital;
- surveillance data collection.

3. NATIONAL HEALTH DISASTER PREPAREDNESS PLAN

3.1. Background

Over the years, and particularly in the last two decades, Somalia has experienced a series of disasters, both natural and man-made, affecting

mainly people in the rural areas. In addition to the heavy damage to shelter, livestock, agriculture and thus to the overall economy of the country, these disasters have taken huge tolls on human lives. So far, measures by the health sector have always been geared towards responding as best it could when the disaster occurred. This has proved to be ineffective and a heavy burden on an already fragile health system with meagre financial and human resources. The only alternative option is to have a disaster preparedness plan established before disasters occur. This will be based on past experience according to the most frequent types of disaster and the resources available. In effect, it is a question of having a contingency plan within each relevant unit of the health sector "on standby" for the most common disasters.

In the past two decades, the nature of disasters experienced by Somalia has greatly diversified. Although predominantly of natural origin, man-made disasters are now common and, indeed, becoming prevalent. Except for occasional earthquakes in the Awdal Region, winds along the coast and localized fire outbreaks in the urban areas, most national disasters in the past have comprised the following.

(a) Drought

About 40% of Somalis are nomads while a further 20% are subsistence farmers, both of whom depend on rainfall. In the event of a drought the consequences can be devastating. In addition, livestock and crops constitute the main exports of the economy. A severe drought thus produces an immediate negative trade balance and consequent inflation. Severe droughts, sometimes involving massive international intervention efforts, were recorded in 1965, 1974 and 1984.

(b) Epidemic

Poor health infrastructure, scarcity of drug supplies, inadequate health manpower, inadequate supplies of safe water, poor sanitation, low immunization coverage and high rates of malnutrition have all contributed in the past to outbreaks of communicable diseases such as cholera, acute diarrhoeal diseases, hepatitis, measles and malaria. Overcrowding in some areas subsequent to influx of refugees and displaced persons has also been a major contributor to the problem.

(c) Man-made disasters

Since the start of the civil strife in the north in May 1988, the health sector has been greatly overburdened in responding to care of the huge numbers of casualties. This is no longer limited to the north but is now expanding and will thus require "a special plan of disaster preparedness" *per se* in terms of financial resources, planning, manpower, supplies and logistics.

3.2. Organizational structure

(a) National Committee for Emergencies

There is a National Committee, its members being the Ministers of Interior, Health, Education, Water and Mineral resources, Transport and Communication, Agriculture, Public Works and Planning. Meetings are held on an ad hoc basis.

(b) National Technical Committee for Emergencies

This Committee consists of the Director-Generals of the above-mentioned ministries; the committee deals with technical matters concerning emergencies under the chairmanship of the Director-General of the Ministry of Health.

(c) Emergency Preparedness and Response Standing Committee

In the Ministry of Health, this committee consists of the Director of the Curative Department (Chairman), Head of the Emergency Preparedness (EPR) Unit, PHC Coordinator, and the heads of the following units: nutrition, hospitals, public laboratories, environmental sanitation, blood banks and Refugee Health Unit, essential drugs and epidemiological statistics. The committee meets regularly and at short notice in emergencies. The committee is responsible for:

- collection of information;
- formulation of EPR policy;
- approval of a national health EPR plan;
- recommendation of budget and workplan for EPR unit;
- supervision of emergency activities;
- cooperation with other ministries and communities.

The Minister of Health has full responsibility for the health sector activities related to disasters, both in the preparedness phase and in emergencies and is a member of the National Committee for Emergencies. The Director of Curative Medicine is responsible to the Minister of Health for emergency preparedness in the health sector. The Vice-Minister of Health is a member of the National Technical Committee for Emergencies, Chairman of the Emergency Preparedness and Response Standing Committee, responsible of the Emergency Preparedness Unit in the Ministry of Health, will supervise the work of the emergency unit both in the Ministry of Health and in coordination with other ministries and agencies and is the WHO focal point in emergency preparedness and response.

(d) The Emergency Preparedness Unit

The functions of the Emergency Preparedness Unit are to:

- coordinate and lead emergency preparedness and response activities of other units in the Ministry of Health;

- meet regularly with heads of other relevant units to prepare a detailed emergency preparedness plan concerning all the different possible disaster scenarios;

- meet regularly with officials dealing with emergency matters of other sectors to integrate the preparedness plans and enhance the communication between the other sectors in emergency preparedness and response subjects;

- meet regularly with emergency units or relevant officials in other ministries for early warning follow-up and possible forecasting of forthcoming disasters;

- immediately hold special meetings with emergency units of other ministries in threatening situations in health-related fields;

- meet with technical bodies of donor agencies involved in emergency relief and coordinate their relief operations in the health sector, during both preparedness and response operations to a disaster,

- have direct authority over district and regional level personnel in health sector in matters concerning emergencies or emergency preparedness;

- be responsible for identifying areas vulnerable to disaster and populations risk;

- prepare detailed plans of action for different units and levels in the health sector for emergencies and update the plans whenever necessary, as well as schemes for cooperation with sectors other than the health sector;

- identify needs, organize and be responsible for training and public education in health emergency preparedness.

SUDAN

DISASTER VULNERABILITY AND OCCURRENCE

M.H. Mushrif

1. COUNTRY PROFILE

Sudan is the largest country in Africa with an area of 2 505 813 square kilometres and has an estimated population of 25 million. The country borders eight African countries. Geographically, Sudan is a flat, featureless plane, with plateaus or mountains near the borders in the west, south-east, and along the Red Sea. From the desert in the north, vegetation gradually improves through semi-arid shrub to low woodland savannah characterized by acacia and short grass. Progressively higher rainfall towards the south promotes trees, shrubs, swamp vegetation, and grassland.

2. DISASTER VULNERABILITY

Sudan is prone to several types of natural disaster, of which the most serious in recent years have been drought and flood. The central and northern parts of the country are particularly vulnerable to drought while major flooding occurs in the eastern region every three to four years. Desertification and deforestation are also a serious threat; it has been estimated that the desert is moving southwards at a rate of 5-6 km per year. Other potential disasters include influx of refugees and displaced persons and continuous civil strife.

2.1. Drought and desertification

Commencing in 1980, drought reached a peak in 1984/85 and the number of victims reached 8.5 million. The regions affected were Darfur, Kordofan, Eastern and Central Region. A population census in 1983 for each of these regions affected by drought gave the following statistics:

- Kordofan 3 240 070
- Darfur 3 093 699
- Eastern 2 208 198
- Central 4 211 470

The numbers of registered displaced person for 1986/87, by region were as follows:

- Kordofan 283 000
- Darfur 287 000
- Eastern 120 000
- Central 118 500
- Khartoum 113 600
- Northern 13 000

2.2. Floods

In August 1988 severe flooding affected 1.2 million people. The regions affected were Northern, Khartoum, Central and Eastern Regions. The population census in 1988 gave the following statistics for these regions:

- Northern 1 076 412
- Khartoum 1 800 000
- Central 4 211 470
- Eastern 2 208 198

The number of health institutions affected by the flooding in these regions was:

- hospitals 45
- health centres 117
- dispensaries 223
- PHCU 81

The number of pit latrines destroyed was around 2.5 million. In Khartoum about 700 000 pit latrines were destroyed and in other regions around 1 800 000. The cost of constructing one pit latrine at that time was SDP 5000 in Khartoum and SDP 3000 for other regions.

In Khartoum 150 000 houses were destroyed and in Northern Region around 60 000. It should be noted that communities rebuilt their latrines with no assistance from either the Government or from non-governmental organization. Likewise communities affected by flooding protected their environment as best they could and no epidemics occurred.

2.3. Refugees

The first influx of Ethiopian refugees was in 1965. The number of recognized refugees at that time was 5000. By November 1989 the total number of recognized refugees in Sudan from Ethiopia, Chad and Uganda was 1 250 000. The Regions most affected by refugees are Eastern, Central and Darfur. The Government provides 70% of the support to refugees and international aid accounts for 30%.

2.4. Civil war

Civil war has continued periodically in Sudan since 1955. The present outbreak started in 1983 and the present number of victims is around 2 551 845. The number of deaths is unknown. The numbers of persons displaced by region are as follows:

Bahr el Ghazal	145 000
Equatorial	338 645
Upper Nile	92 000
Khartoum	1 621 200
Kordofan	130 000
Darfur	220 000
Central	55 000
Northern	165 000
Total	2 551 845

3. ENVIRONMENTAL HEALTH ACTIVITIES IN DISASTER

The various disasters which affect Sudan differ in character type, duration and impacts. The environmental health approach required also differs. Different health activities, mainly preventive, curative and promotive, have been utilized to combat and the adverse effects which expose hundreds of thousands to misery and threat of disease. The objectives of the environmental health programme are to:

- combat the outcome of adverse environmental conditions through proper solid and liquid waste management;
- reduce morbidity and mortality through control of communicable diseases by reduction of vector-borne diseases;
- provide a safe drinking water supply, with suitable treatment, storage and distribution facilities;
- raise the awareness of the population through health education programmes.

The environmental health strategy employed in emergencies has the following elements:

- gathering of manpower and mechanical power to be utilized in the needy areas;
- solid waste collection for disposal;
- liquid waste management;
- control of vectors of medical importance e.g. flies, mosquitoes;
- Treatment, storage and distribution of safe water supply;
- health education programmes through mass media;
- community participation in conveying health services.

The plan of action is as follows:

1. Cleaning campaigns covering urban and rural areas;
2. Spraying campaigns covering affected areas using residual insecticides;
3. Control of flies at larval stages by burning carcases of dead animals, and application of larvicides in breeding sites;
4. Control of mosquitoes at larval stages by applying larvicides to breeding sites, biological control methods and engineering;
5. Involvement of communities in all environmental health activities;
6. Introduction of health education programmes through mass media;
7. Intensive food control programme through regular inspection of food, premises and personnel;
8. Proper testing, treatment, storage and distribution of drinking water;
9. Application of environmental health legislation;
10. Special attention given to places housing displaced persons, refugees and shanty areas in all activities of environmental health.

The main constraints of the health services are:

- scarcity of resources available for health;
- lack of supervision, monitoring and evaluation at all levels;
- lack of general services in the country;
- high illiteracy rates, poor housing, bad sanitation and poor socioeconomic status.

The numbers of environmental sanitation staff throughout the country are:

- public health inspectors	345
- sanitary overseers	670
- assistant sanitary overseers	950
- sweepers	3000
- mosquito men	500

The provision of appropriate environmental health activities is inadequate due to lack of manpower and technical material, lack of funds, poor accessibility to many parts of the country and insufficient health information. When disaster strikes a community, it is beyond the capacity of the Ministry of Health and environmental health department to provide basic environmental health needs. Even without disaster, many communities have not yet been reached.

SYRIAN ARAB REPUBLIC

DOMESTIC WASTE - PREVENTION AND CONTROL OF POLLUTION

D.N. Abdul Karim

1. SOCIOECONOMIC INDICATORS

The population in the Syrian Arab Republic has grown at a rapid rate in the past two decades, increasing from 4.3 million in 1960 to 6.3 million in 1970. As in many developing countries, nearly 50% of the population is under 15 years of age, placing a heavy burden on the economy to provide education and other public services. The general population statistics according to 1960, 1970 and 1981 censuses are as follows:

Total population:	1960	4 300 million
	1970	6 300 million
	1981	8 996 million
	1987 projection	10 969 million
	2000 projection	18-20 million

Urban population %: 36.9 (1960) 42.0 (1981)

Average annual population growth per 1000 (1970-1981): urban 40.9
rural 27.5

Total 33.6

The infant mortality rate is 59.8 per 1000 and average life expectancy rate 65.1 years. The number of cities with 1-1.9 million population is two and there are 6516 villages.

2. NATURAL HAZARDS

Parts of the country are subject to natural hazards, mainly fresh water floods and earthquakes. Although there are no data on the areas most affected nor on the populations at risk, it is believed that natural hazards do not constitute a major environmental problem.

3. SOURCES OF POLLUTION

The main sources of pollution are:

- industry: refineries, oil products and fertilizers;
- wastes: domestic, hospital and solid.

On a per capita basis the amount of domestic waste generated from the main cities ranges between 0.11 kg/cap/day for Tartous to 0.43 kg/cap/day for Homs which is very low compared with international standards. The organic composition (see Table 1) of the waste is high (60%) which is indicative of the high amount of food matter (kitchen waste) in the domestic garbage. The improper disposal of domestic waste has caused land, water, marine, and air

TABLE 1 COMPOSITION OF DOMESTIC WASTES

Composition	
Organic matter	60
Paper, wool, textiles	15
Glass	3
Plastics	7
Metals	3
Others (dust, sand)	11

pollution around major cities in the country, in particular in Damascus and Homs. Fire is also reported to be a major problem in these places. Hospital-generated solid wastes are also a matter of concern. According to the 1984 State of the Environment report, some 5000 tonnes of hospital waste was generated annually from the various hospitals around the country, most of which was disposed of with the common waste, adding further potential public health problems.

4. POLLUTION CONTROL

In 1985, the Central Environmental Protection Committee was established; the members include, in addition to the State Minister of Environment, the concerned ministers. The main responsibilities of the committee are prevention, reduction and control of pollution. These responsibilities cover all sources of pollution according to recognized international standards and deal with the implementation of the national environmental programme, including scientific research, training, public awareness and selection of pollution control equipment.

5. PUBLIC AWARENESS PROGRAMMES

There are four major on-going environmental public awareness programmes dealing with the following:

- the safety of the agricultural environment;
- public health awareness;
- water usage of protection;
- air quality protection.

TUNISIA

EARTHQUAKE

L. Farza

1. INTRODUCTION

An emergency may be defined as an acute and unusual situation which may affect directly or indirectly human vital processes.

There are two kinds of emergency:

(a) The individual emergency which is generated by inner factors and which concerns generally one individual requiring medical care;

(b) The public emergency which is generated by external or environmental factors which may concern generally more than one individual and which requires multiple disciplinary care and not only medical care.

Public emergencies may also be grouped into two categories:

- natural emergencies, like earthquakes and floods;
- anthropogenic emergencies i.e. those linked with human activities or human behaviour.

However, this classification is, to a certain extent, artificial and interaction may exist between the two categories.

One of the most common public emergencies occurring in Tunisia concerns earthquakes. Tunisia belongs to the seismic band of the western Mediterranean Sea which covers Italy, Spain and North Africa.

Tunisia can be divided into two seismic areas:

- An area with high seismicity which comprises the north, the centre and the south-west where the unusual intensity of earthquakes varies from 5 to 9 on the Richter scale.

- An area with moderate seismicity which concerns the remaining area of the country and where the maximum intensity of the Richter scale varies from 2 to 4.

Hundreds of earth tremors have occurred in Tunisia, the biggest being those which destroyed Utique, a town near Tunis, in 410 AD, and Tunis itself in 1856 (45 000 deaths). Metharic, a mining city of 30 000 inhabitants, situated in the south-west of the country has suffered at least 50 earthquakes in recent times, the maximum intensity of these earth tremors fortunately has not exceeded 4 on the Richter scale. The tremors occur generally at night with up to three in one night.

This situation has generated distress among the population and led to many economic, sanitary and environmental problems. For instance, the mining of phosphates, which is the main economic activity in the area, has ceased. Parents have refused to send their children to school and keep them at home.

At the beginning of this phenomenon, many people were panic-stricken and cases of hysteria were observed.

When an earth tremor occurs, people leave their houses. Shelter-tents have been set up in the streets and many people pass the night there and return to their homes in the morning. After several days, the anguish is still present and the incidence of headaches, insomnia, and bronchitis, especially among children, is very high and the consumption of psychotopic drugs reaches a level not previously experienced in the area.

The government has taken the situation seriously and has sent civil protection units to the area to hearten the population and eventually to help. The Ministry of Public Health sent 20 ambulances and a sanitary unit comprising medical doctors and nurses.

Control of environmental health has been strengthened, especially the control of water reservoirs, of water quality and of the hygienic situation in shelter-tents. A pre-disaster plan has been established and is reviewed every day. It involves all the concerned departments and is coordinated by the governor of the area.

This activity has had some positive effects; the government has decided to help people who have very old houses to build new ones. Legislation dealing with environmental emergencies is being discussed by the government.

The economic cost of preparedness for disaster is so high that for developing countries it seems necessary to focus efforts upon preventive measures.

ANNEXES

Annex 1

INTERNATIONAL DECADE FOR NATURAL DISASTER REDUCTION

1. UN GENERAL ASSEMBLY RESOLUTION

In resolution 42/169 of 11 December 1987, the General Assembly decided to designate the 1990s as a decade in which the international community, under the auspices of the United Nations, would pay special attention to fostering international cooperation in the field of natural disaster reduction. The objective of this Decade would be to reduce, through concerted international actions, loss of life, property damage and social and economic disruption caused by natural disaster, particularly in developing countries.

2. UN STEERING COMMITTEE

In February 1988, the Secretary-General established a steering committee on the Decade to assist him in developing an appropriate framework to attain its objectives and goals. The Director-General for Development and International Economic Cooperation of the Secretariat was designated Chairman and the United Nations Disaster Relief Coordinator, Vice-Chairman. Members of the Committee are designated senior officials of the Department of Technical Cooperation for Development and the Centre for Science and Technology for Development of the Secretariat, UNDP, UNEP, UNCHS, WFP, FAO, UNESCO, WHO, World Bank, ITU, WMO and IAEA. Other entities of the United Nations system are associated with the work of the Committee when questions of direct interest to them are being considered. A working group of the steering committee has prepared several documents for approval by the Committee as input to the work of the experts group.

3. INTERNATIONAL AD HOC GROUP OF EXPERTS ON THE DECADE

To assist him in developing an appropriate framework for the Decade, the Secretary-General appointed a panel of 25 eminent scientists and experts. The experts group, under the chairmanship of Dr Frank Press (President of the United States National Academy of Sciences) has held four meetings, in July 1988 in Geneva, in October 1988 in New York, in January 1989 in Rabat and in April 1989 in Tokyo. In Tokyo, the expert group finalized its report to the Secretary-General, and adopted a "Tokyo Declaration" on the International Decade for Natural Disaster Reduction.

4. NATIONAL COMMITTEES

On 29 July 1988, the Director-General for Development and Internatioanl Economic Cooperation of the Secretariat addressed a letter to Member States, in which, among other things, he drew to their attention the provisions of General Assembly Resolution 42/169 relating to the establishment of national committees and included an annex on possible modes of organization at the national level. It was suggested that areas of activity for national committees might include:

a) Identification of hazard zones and hazard assessment;
b) Monitoring, prediction and warning;
c) Short-term protective measures and preparedness;
d) Long-term preventive measures;

e) Land use and risk management;
f) Public education and information

Governments were asked to provide information on any action taken towards establishing a national committee or other official body for the Decade. Several governments have already reported the establishment of such committees.

5. COOPERATION WITH NON-GOVERNMENTAL AND INTERGOVERNMENTAL ORGANIZATIONS

General Assembly Resolution 42/169 requests the Secretary-General to cooperate with the relevant scientific, technical, academic and other non-governmental organizations in developing an appropriate framework for the Decade. Contact has been established with a number of scientific and engineering organizations that have been active in one or more fields covered by the Decade. Contacts have also been established with several inter-governmental organizations outside the United Nations system.

6. WHO'S ACTION

Global

WHO has participated in the meetings of the UN Steering Committee Working Group in Geneva, New York, Rabat and Tokyo, represented by Head EPR. Documentation regarding the International Decade for Natural Disaster Reduction (IDNDR) has been sent to the Regional Offices and comments received from the Regional Offices have been transmitted to the Steering Committee and Expert Group.

In his memorandum of 2 February 1989 to the Regional Directors Dr M. Abdelmoumène, Deputy Director-General, suggested that the Regional Directors might like to consider "encouraging the health authorities in active participation and, as appropriate, leadership in the organization and constitution of a national committee for the Decade".

A meeting of the WHO Emergency Preparedness and Response Collaborating Centres in Atlanta, January 1989, discussed the organizations's activities for IDNDR. An interregional meeting on emergency preparedness and response, to be held in Alexandria (EMRO) 11-13 June, will consider WHO's global and regional activities in relation to IDNDR, and will make proposals for programmes and projects.

Regional

The Regional Committee for the Americas, in its meeting on 27 September 1988, adopted Resolution IV on "Assistance to countries affected by Hurricane Gilbert, urging the Member States to: "consider emergency preparedness of the health sector as a development priority for allocation of national and international resources in the context of the forthcoming Decade on Disaster Reduction".

The Regional Director, AMRO has also sent a letter to all Ministers of Health recommending that they play an active role in the establishment of a National Committee for International Disaster Reduction. AMRO, together with HQ, organized a meeting for North American NGOs in New York in January 1989. AMRO contributed to a meeting of civil defence officials from Latin America

in Costa Rica in January 1989 and is organizing a meeting in May 1989 for the representatives of its Member States, on IDNDR.

7. WHO'S ROLE DURING THE IDNDR

Global

WHO's overall role in the Decade arises out of its constitutional function to act as the directing and coordinating authority on international health work. Thus the Organization will stimulate the inclusion of health inputs into national plans and programmes aimed at natural disaster reduction. National, regional and interregional seminars, workshops and other training programmes will provide opportunities for the introduction of the aims and activities of the Decade to health workers. More specifically, WHO's role would include:

(a) Promotion and coordination, within the health sector, of all activities aimed at the reduction of the occurrence and health impact of natural disasters;
(b) Promotion and support to Member States for the establishment and/or strengthening of political and technical focal points responsible, within the health sector, for the activities of the Decade and strengthening of the institutions dealing with the IDNDR;
(c) Technical support and promotion of a continuous education effort of the general public on the health impact of natural disasters and the importance of preventive measures;
(d) Cooperation with other agencies such as UNDRO, UNESCO, UNICEF, and with nongovernmental organizations.

It will be necessary to introduce the Decade at various levels of the Organization, from reporting to the governing bodies of WHO, to briefing and introducing WHO staff to their roles and responsibilities regarding the Decade. The six WHO Regional Committees in 1989 will provide an entry point for the Decade during discussion of the reports on "Emergency Preparedness and Response" prepared by the Regional Directors.

WHO's activities that relate most closely to the Decade are contained in the Medium Term Programmes for several areas of which the Programme for Planning, Coordination and Cooperation - which includes Emergency Preparedness and Response - and the Environmental Health Programme - which includes chemical safety, environmental pollution, water and sanitation - are the most relevant. However, other programmes such as those concerned with disease control, health manpower development, information and education for health also contain elements which may further the goals of the Decade.

Practical arrangements within WHO may include the assignment of technical responsibilities to those programmes with the most relevant experience and capacity.

Regional

The regional activities, in support of country level action, may include:

(a) Promotion and technical support to vulnerability analysis of the existing essential health-related services (hospitals, health centres, water supply systems) as well as hazardous industries or deposits in disaster-prone areas.

(b) Adoption of disaster-resistant design in the planning of essential health services in areas prone to natural disaster covered by the Decade (earthquakes, hurricanes, floods).

(c) Inclusion of basic concepts of disaster prevention and preparedness into the academic curriculum of the medical, nursing, sanitary engineering and other health-related schools or faculties.

(d) Education/information to the general public on issues related to disaster prevention and preparedness. This activity will be undertaken and expanded through the development of videos and other materials directed to the general public, and periodic national and international workshops with the mass media which actively promote the objectives of the Decade. The experience gained in the Region of the Americas and the audio-visual resources available could be used by WHO as a whole. Cooperation with UNDRO, and EPR collaborating centres is being actively sought for this activity to avoid duplication and dispersion of efforts.

e) Prevention and preparedness at the community level. There is a risk that the benefits of the Decade will accrue largely to urban and large metropolitan areas. WHO is therefore actively increasing its cooperation at the community level.

As the type of disaster varies between the Regions, the activities may differ accordingly. Whatever activities there may be, sustainability has to be kept in mind.

Annex 2

TOKYO DECLARATION
ON THE INTERNATIONAL DECADE FOR NATURAL DISASTER REDUCTION

We, the Ad Hoc International Group of Experts for the International Decade for Natural Disaster Reduction, hereby declare the following:

Throughout history, mankind has lived under the threat of natural disasters. Millions of lives have been lost in recent decades, with untold human suffering and property damage as well as setbacks to development efforts. Indeed, the situation is growing worse. Vulnerability to natural disasters is rising due to population growth, urbanization, and the concentration of industry and infrastructure in disaster-prone areas. But we now have improved capacity to confront the problem. Fatalism is no longer acceptable; it is time to bring the full force of scientific and technological advancement to reduce the human tragedy and economic loss of natural disasters.

This concept is the premise of the United Nations General Assembly decision, in its Resolution 42/169 of 11 December 1987, to designate the 1990s as an International Decade in which the world community joins to cooperate on natural disaster reduction.

The Secretary-General of the United Nations, who was asked to develop a framework to attain the objective and goals of the Decade, appointed our committee, the Ad Hoc International Group of Experts. We are 25 scientists and technical experts drawn from throughout the world and representing the spectrum of disciplines engaged in disaster reduction. We will soon submit our report to the Secretary-General, but today we wish to call to the world's attention our common conviction that million of lives can be saved, hundreds of millions protected from tragedy, and hundreds of billions of dollars saved as a result of the International Decade.

Since our first meeting in Geneva in July 1988, there have been floods in the Sudan and Bangladesh, hurricanes Gilbert and Juana in the Caribbean and Central America, destructive earthquakes in China, India, Nepal. and the USSR, and severe drought and locust infestations in Africa. The post-disaster response of the international community has been generous. But observing these and other tragic events has convinced us of the need for increased efforts in disaster planning, preparedness, and prevention.

We believe that the Decade is a moral imperative. It is the first coordinated effort to prevent the unnecessary loss of life from natural hazards. It also makes practical sense. The Decade is an opportunity for the world community, in a spirit of global cooperation, to use the considerable existing scientific and technical knowledge to alleviate human suffering and enhance economic security. In implementing the Decade, the vulnerability of developing countries must be of special concern.

Thus we, the Ad Hoc International Group of Experts, call on:

The people of the world, as well as their governments, to work toward greater security against natural disasters;

The governments of all countries to participate actively in the Decade by educating and training their citizens to increase awareness, by enhancing social preparedness, by integrating disaster-consciousness into their development programmes, and by making available the power of science and technology to reduce disaster loss;

The United Nations, scientific and technological institutions, nongovernmental organizations, and the private sector to support international and regional cooperation on disaster-related activities and to contribute to the transfer of disaster-reduction technology, particularly in disaster-prone developing countries.

The Decade is an opportunity for action, both immediate and long term. Specific projects can be implemented immediately to help achieve a safer world. Implementation of the Decade requires commitment of the international community to enhance the level of technical cooperation, particularly with regard to developing countries. The Group calls for all countries to form national committees to plan for and coordinate national efforts. It suggests that the United Nations General Assembly consider the establishment of a unique cooperative mechanism, supported by extrabudgetary resources, that brings together the diverse groups that can contribute to the Decade. It seeks the commitment of the international community to assure the availability of resources to implement this important activity.

The Group is confident that through these actions mankind will capture the promise of enhanced security and prosperity.

Annex 3

WORLD HEALTH ORGANIZATION

Emergency Preparedness and Response
Report of Activities
1988

1. INTRODUCTION

Disasters affect an increasing number of people in both developed and developing countries.

Large-scale epidemics of communicable diseases and natural disasters such as earthquakes, volcanic eruptions, floods and cyclones represent an increasingly serious threat in many parts of the world. Drought, and consequent famine, war and civil strife cause large-scale population movements of a long-term nature with devastating effects on local and national economies, mostly affecting developing countries whose fragile structures can least afford them.

At the same time, both developed and developing countries are facing the threat of man-made or technological disasters, caused by traffic, fires, explosions, collapses of dams and buildings, while advanced technology brings about risks of accidental release of toxic substances and wastes and of nuclear contamination into the environment.

2. POLICY BASIS

WHO's mandate for disasters and emergencies stems from its constitution, which states that one of the functions of the Organization is to furnish necessary aid in emergencies. The guiding principles for WHO's emergency preparedness and response programme strategies are set out in World Health Assembly resolution WHA34.26, adopted in 1981, which stresses the fundamental importance of preventive measures and preparedness and reaffirms the need for the Organization to assume a leading role in the health aspects of disaster preparedness. More recently, World Health Assembly resolution WHA38.29, adopted in 1985, emphasized the necessity of an integrated response, linking emergency measures with long-term development, and the need to intensify WHO's technical cooperation at country level, to enable Member States to enhance their disaster preparedness and their capability to respond to the health consequences of a disaster as an integral part of the regional and global strategies for health for all.

3. SITUATION ANALYSIS

In the 1970's and the beginning of the 1980's, WHO's main disaster activity was relief. Gradually, the emphasis has changed to disaster preparedness and response, to include involvement in training, in assessment of health situations and needs, and in coordination of large-scale disaster operations. The WHO Regional Office for the Americas (AMRO) has spearheaded the development of a natural disaster preparedness and response programme. The WHO Regional Office for Europe (EURO) tackles disaster within the framework of its accident prevention programme, with an emphasis on technological disasters. Recently, the other WHO regional offices have