Health Services Organization in the Event of a Disaster

Study Guide and Course Text
Health Services Organization in the Event of a Disaster

Study Guide for C280-BC04

Prepared for the Disaster Management Center by Jose Luis Zeballos, Richard Hansen and Don Schramm

To be used in conjunction with
Pan American Health Organization Scientific Publication No. 443

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This Study Guide is one in a series of five prepared by the University of Wisconsin-Extension, Department of Engineering and Applied Science, Disaster Management Center with financial support from the Pan American Health Organization (PAHO). This self-study series is designed to use scientific publications of the Pan American Health Organization as texts for the study of health-related issues in disaster management. Each module of the series includes a PAHO text, a study guide, pretest, self-assessment tests and a final examination.

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Foreward

In the event of a natural disaster, a nation, region, community or individual will return to normal more quickly if there has been advance planning on the use of available resources.

A plan to mobilize a country’s resources for disaster management is a complex undertaking, as illustrated below.

The health sector must cooperate with other groups involved in the overall plan. In addition, they must work within the framework and priorities established by those in higher authority. Within the overall plan is a section dealing specifically with health and subplans for various units of the health sector. (See illustration.)

**Organization of a National Emergency Committee**

* NGO = Nongovernmental organizations (also called voluntary agencies)
Introduction

How to Get Started

This self-study course will help health personnel meet the needs of people experiencing a sudden natural disaster or other disaster resulting in mass casualties. Designed primarily for health care professionals, paraprofessionals, and those in training, this course may also be of value to governmental personnel and representatives of private voluntary agencies.

The course deals with those areas requiring attention by the health care delivery system. It points out problem areas identified historically in disaster, makes recommendations for preparedness, and offers suggestions for mitigating the impact of disaster on the health and welfare of the population.

The course is based primarily on the Scientific Publication, *Health Services Organization in the Event of a Disaster*, published by the Pan American Health Organization.

The procedure of self-study is:

- Complete and score the Pretest. Do not be disappointed if you have a low score. If you have a high score, you probably do not need this course.
- Read the Outline of Course Content to get a general idea of what is covered in the course.
- Read the Learning Objectives to get a general idea of what you are expected to learn from the course.

Turn to Lesson 1: Introduction

- Review the Study Guide section for a brief description of the lesson and any special suggestions on how to study.
- Again read the Learning Objectives.
- Carry out the Learning Activities listed.
- Complete the Self-Assessment Test at the end of the lesson and score it using the answer key provided. If you have not answered most of the questions correctly, restudy the lesson.

If you score well on the Self-Assessment Test, proceed to Lesson 2.

Continue to study each lesson and complete the Self-Assessment Test until you have finished the course of study. When you have completed all the Self-Assessment Tests to your satisfaction, you should request the Final Examination Package. This will include the Final Exam and a Disaster Development Problem.
Pretest

Multiple Choice
Circle the correct answer(s):

1. Most rural health centers are set up to perform:
   a. health promotion
   b. disease prevention
   c. first aid
   d. all of the above

2. One function of a hospital's disaster plan committee is to:
   a. give final approval to the proposal submitted by the chairperson
   b. be sure the plan can function autonomously without outside help
   c. arrange for drills and simulation exercises
   d. accommodate the plan to the hospital's budgetary program
   e. assign responsibility for the plan's execution to personnel outside the committee

3. There are several ways to increase the number of beds available in a disaster situation. Which of the following methods are accepted practice:
   a. limit hospitalization to patients in critical or serious conditions
   b. hallways can be used for extra beds
   c. single-bed rooms can be converted into double rooms
   d. all of the above
   e. a and c

4. During disaster conditions, the head nurse has among his/her responsibilities:
   a. placing an orange armband on each member of the emergency department staff
   b. receiving the instruction sheet from a member of the nursing staff
   c. notifying all people in the emergency room that they will be examined in turn
   d. assigning a physician to each of the triage areas
   e. conducting members of the patients' families to a waiting room

5. A disaster notification list comprises:
   a. names of family and close relatives of disaster victims
   b. units, departments, or services of the hospital that will be required to spring into action
   c. a high-level staff at the national medical center, the lead hospital, satellite medical care units and special medical care centers
   d. key administrators in the armed forces, civil defense, police, fire departments, and other emergency units of government
   e. areas likely to be struck by an approaching disaster and medical care units in and around the area

6. A simulation exercise runs participants through a true-to-life disaster occurrence-response situation except that it does so:
   a. within the confines of the hospital
   b. without supplying clear and precise information
   c. only with respect to the disaster occurrence period
   d. by slowing down and highlighting one particular sequence of events
   e. at an accelerated pace

7. The three stages of disaster management are:
   a. early warning, initial response, treatment and maintenance
   b. predisaster preparedness, action during the emergency, postdisaster rehabilitation
   c. drills and simulations, action during the emergency, evaluation of the disaster management plan
   d. search and rescue, care for victims, rehabilitation and reconstruction
   e. initial disaster response, action during the disaster, evaluation of response

8. Which of the following is not one of the five general planning objectives for a health preparedness plan:
   a. coordinate the use of resources to avoid duplication of effort
   b. carry out training for professional and volunteer staff of the emergency care system
   c. increase stocks of medical supplies and equipment
   d. orient community action in disaster situations
   e. keep a current inventory of all resources in the medical care area

9. Health resources workers who should be involved in disaster planning include:
a. physicians
b. social workers
c. healers
d. all of the above
e. only a and b

10. Triage begins when victims are encountered by:
a. search and rescue personnel
b. local survivors
c. rural hospital personnel
d. base hospital personnel
e. emergency room personnel

11. Which of the following is not among the subjects that should be taught to the general public as part of a predisaster preparedness plan:
a. search and rescue
b. first aid
c. triage and tagging
d. transportation of the injured
e. rehabilitation measures

12. The priority aspect of a rural health care preparedness plan should be:
   a. training of medical and paramedical personnel
   b. organization and outfitting of facilities
   c. training and motivation of communities
d. all of the above
e. a and c

13. Which of the following is not one of the minimal standards of organization and coordination to be observed at a disaster scene:
   a. establish a command post
   b. assess the disaster's magnitude
   c. select an area for triage and tagging
d. deliver medical care for serious casualties
e. establish communications with health facilities

14. Which of the following is not a principal objective of a disaster plan for a health facility:
   a. prepare the staff and institutional resources for optimal performance in an emergency situation of a certain magnitude
   b. make the community aware of the importance of the disaster plan, how it is executed and the benefits it provides
   c. plan the construction of facilities and train new staff to meet the requirements of a disaster
d. establish security arrangements to be implemented in the event of an accident within the institution

True/False
(Indicate T or F)

___ 15. Private health facilities should be excluded from a national system of disaster response.

___ 16. Regionalization should set forth a clear definition of the category, location and degree of sophistication for health institutions.

___ 17. When the switchboard operator is informed of a disaster, but before the disaster plan is put into operation, the first person he/she should call is the director of the hospital.

___ 18. It is important that search and rescue personnel be trained in first aid.

___ 19. The order of evacuation for red, yellow, and green-tagged casualties is the same whether casualties are trapped or buried.

___ 20. The immediate care of disaster victims is usually the only problem facing health personnel.

___ 21. A health care preparedness plan is developed separately from a national disaster preparedness plan.

___ 22. In determining its peak operational capacity, a hospital need not be concerned about facilities for minimally injured and ambulatory patients since they will be treated elsewhere if a disaster occurs.

___ 23. Voluntary agencies are expected to provide assistance in areas not covered by a disaster emergency plan.

___ 24. A hospital planning a drill to evaluate its disaster plan should invite the Red Cross as a participant.

___ 25. Hospital disaster plans should be updated frequently.

___ 26. A hospital should be prepared to handle every aspect of a disaster situation.
27. Unannounced drills are carried out without prior scheduled drills having taken place.

28. Disaster planning includes measures to lift bureaucratic barriers.

29. The recommended procedure is to update a hospital disaster management plan by accounting for changes in staff and resources, and then to evaluate its effectiveness.

30. Following an earthquake, widespread looting and criminal behavior are generally not the norm.

31. During a disaster, the hospital switchboard operator will attempt to continue processing normal calls that do not interfere with emergency procedures.

32. Demarcation of health center service areas is an important factor in the structuring of emergency plans.

33. If there are no red-tagged patients, green-tagged patients with apparently fatal injuries become red-tagged candidates.

34. A mobile hospital is an inexpensive way of adding facilities at times of disasters.

35. A hospital disaster plan should show the location of drains and of sewage and solid waste outlets.

36. Persons entering a hospital under their own power need not pass through the triage area.

37. A performance audit of a hospital's disaster plan could lead to punitive action if substantial defects are found.

38. A hospital emergency plan should be coordinated with similar plans in other institutions.

39. One objective of holding a drill to evaluate a hospital disaster plan is to minimize the time required to put the hospital on an emergency footing.

40. A hospital disaster plan need not deal with firefighting techniques since that is done by firefighters and not health personnel.

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Outline of Content

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• Classification of medical care centers

Lesson 3 - Organization of First Level Care at the Disaster Site
• Minimal standards of organization
• Role of mobile hospitals
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• Purpose of evaluating and updating
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Course Objectives

Lesson 1 Introduction
• List four results of sudden natural disasters that may cause health problems for people.
• Understand the importance of having a health care disaster plan as an integral part of an overall national disaster preparedness plan.
• List the three chronological stages of disaster management activities.
• Identify the five general objectives of an emergency plan.

Lesson 2 Organization of the Health System
• Recognize that a unified health care disaster plan should include the country's official health care system; autonomous, semiautonomous, and private health facilities; and voluntary agencies.
• Explain why establishment of a network and regionalization of health services is important in times of disaster.
• Know the important role of the national emergency committee or the civil defense system in uniting the health system with other ministries or systems, to function effectively in a disaster situation.
• Define the five medical care center classifications used in disaster management planning.

Lesson 3 Organization of First Level Care at the Disaster Site
• List the two types of care normally provided at the site of a disaster.
• Describe five minimal standards of organization required at the disaster site.
• Explain the advantages and disadvantages of mobile hospitals.
• Define the mission of search and rescue units.
• Explain the primary basis for classifying casualties at the disaster site.
• Describe the degrees of injury and priorities normally associated with red, yellow, and green triage tags.

Lesson 4 Organization of Rural Health Services for Disaster Situations
• List the two major limitations in planning for disaster management of health services in remote communities and rural areas.
• Identify the most important predisaster activity that can be carried out in these areas.
• List five subjects that should be taught in remote communities and rural areas to prepare people to cope with sudden natural disasters.
• Be familiar with small community human resources available for providing health services in disaster situations.
• Realize that human behavior following a natural disaster is normally positive and of great value in coping with problems caused by the disaster.

Lesson 5 Organization of Health Care Facilities for Disaster Situations
• Understand the general principles involved in planning for disaster situations in health care facilities.
• List the three principal objectives of a disaster plan developed for a health care facility.
• List the five characteristics for such a plan.
• Realize that a plan must provide specific actions to be taken during the periods of alert, impact, emergency, rehabilitation, and reconstruction.
• Know the six basic services that must be assured if a health facility is to function in carrying out its disaster plan.
• Describe the five functions of a disaster plan committee.
• List four ways in which the number of available beds can be increased.
• Understand the factors a hospital must analyze in defining its operational capacity in times of internal or external disaster.

**Lesson 6 Implementing the Disaster Plan in a Health Care Facility**
• Understand the importance of having a clearly defined, detailed procedure when announcing that a disaster plan is in operation.
• Appreciate the complexity of alerting units and departments when the disaster plan is being put into immediate operation.
• Know how the triage procedure at the health care facility functions.
• Describe the roles of the triage, major treatment, and minor treatment areas.
• Describe the roles of the switchboard operator, family information center, and director of public information in keeping the community informed.

**Lesson 7 Updating and Evaluating the Hospital Disaster Management Plan**
• Give two reasons for updating a hospital plan at least once a year.
• Understand the need to evaluate every element of the institution and the activities each is expected to carry out in implementing the plan.
• List the two main purposes of an evaluation.
• List the types of drills that may be used in evaluating a plan.
• List the three principal objectives of drills.
• Know the importance of involving external agencies and institutions in a drill evaluating a hospital plan.
• Understand the advantages that simulated disasters provide to a plan's evaluation.
• Understand the benefits and limitations that performance audits provide to a plan's evaluation.
Lesson 1 - Introduction

Study Guide
This lesson provides an overview of the health problems associated with sudden natural disasters and other disasters resulting in mass casualties, the critical importance of advance planning and organization, and the general objectives of a health services disaster management plan.

Learning Objectives
• List four results of sudden natural disasters that may cause health problems for people.
• Understand the importance of having a health disaster plan as an integral part of an overall national disaster preparedness plan.
• List the three chronological stages of disaster management activities.
• Identify the five general objectives of an emergency plan.

Learning Activities
• Read pages 7-10 in the manual.
• Read pages 3-5 in the manual.

Evaluation
Complete the Self-Assessment Test.

Lesson 1 Self-Assessment Test

Multiple Choice
Circle the correct answer(s):

1. The three stages of disaster management are:
   a. early warning, initial response, treatment, and maintenance
   b. predisaster preparedness, action during the disaster, postdisaster rehabilitation
   c. drills and simulations, action during the disaster, evaluation of the disaster management plan
   d. search and rescue, care for victims, rehabilitation and reconstruction
   e. initial disaster response, action during the disaster, evaluation of response

2. Whether the health sector launches a well-coordinated response during the emergency phase of a natural disaster will mainly depend on:
   a. functional communication systems
   b. availability of personnel
   c. local cooperation and assistance
   d. the organization of medical care
   e. availability of water and sanitation services

3. General health services disaster planning objectives include all of the following except:
   a. increasing stocks of supplies and equipment
   b. maintaining an inventory of resources
   c. carrying out training activities
   d. orienting community action
   e. coordinating the use of resources

   True/False
   Indicate T or F:

   4. The immediate care of disaster victims is usually the only problem facing health personnel.

Answer Key
1. b
2. d
3. a
4. F
Lesson 2 Organization of the Health System

Study Guide

This lesson presents general rules in organizing the health system to cope with sudden natural disasters and other disasters resulting in mass casualties. It stresses involvement of the total health care system, public and private, into a unified national system. This system then becomes a network ranging from the national medical center to medical care posts, with each having its function and responsibilities. Other emphases are the importance of regional flexibility; the need for strong, visible, trained leadership; and the classification of health service institutions within the network.

Learning Objectives

• Recognize that a unified health care disaster plan should include the country's official health care system; autonomous, semi-autonomous, and private health facilities, and voluntary agencies.
• Explain why establishment of a network and regionalization of health services is important in times of disaster.
• Know the important role of the national emergency committee or the civil defense system in uniting the health system with other ministries or systems, to function effectively in a disaster situation.
• Define the five medical care center classifications used in disaster management planning.

Learning Activities

• Read pages 7-10 in the manual.
• Skim pages 81-91 in the manual (Annex 2). In order to develop a regionally organized file that identifies resources, capabilities and level of autonomy for health care centers nationwide, surveys such as this should be conducted.

Evaluation

Complete the Self-Assessment Test.
Lesson 2 Self-Assessment Test

Matching
Match the regional medical facility with the category of care that is most closely associated with it.

Regional Medical Facility
____ 1. satellite medical care unit
____ 2. national medical center
____ 3. special medical care center
____ 4. lead hospital
____ 5. medical care post

Category of Care
a. no hospital capacity, rural or suburban
b. treatment limited to specialized areas of medicine
c. highest level hospital
d. hospital capacity with limited resources
e. state or regional care

True/False
Indicate T or F:

__ 6. The organization of health centers for disaster situations should be planned in advance and based primarily on the country's existing normal health and medical care structure and system.

__ 7. The autonomous, semi-autonomous and private health facilities should become part of a national system for dealing with disasters.

__ 8. In case of disaster, the voluntary agencies need not necessarily adapt their activities to plans and assignments developed by the national authorities.

__ 9. The national emergency committee or civil defense system is responsible for uniting various health facilities in disaster planning.

__ 10. Organization for disaster situations largely involves facilities and practices outside of the normal medical care system.

__ 11. Regionalization should set forth a clear definition of the category, location and degree of sophistication for health institutions.

__ 12. Private health facilities should be excluded from a national system of disaster response.

Answer Key

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Lesson 3 Organization of First Level Care at the Disaster Site

Study Guide
This unit begins to present specific details on how the health system should be organized to deal with the results of a disaster. It presents information on providing relief and first aid to victims at the disaster site and making decisions on triage and evacuation.

Learning Objectives
• List the two types of care normally provided at the site of a disaster.
• Describe five minimal standards of organization required at the disaster site.
• Explain the advantages and disadvantages of mobile hospitals.
• Define the mission of search and rescue units.
• Explain the primary basis for classifying casualties at the disaster site.
• Understand the concept of triage and the procedures of classification and tagging of victims.

Learning Activities
• Read pages 11-17 in the manual.
• Refer to the First Aid Training Checklist, page 101 of manual (Annex 6).
• Examine the model triage tag on page 102 of the manual (Annex 7).

Note: The color coding given in Annex 7 is correct. If you a hard copy of the publication, Page 15 and 16 in the manual should be corrected.

Red = first priority
Yellow = second priority
Green = third priority

• Read pages 77-80 in the manual (Annex 1). This presents facts and myths about individual and group human behavior likely to be encountered at disaster sites.

Evaluation
Complete the Self-Assessment Test.
Lesson 3 Self-Assessment Test

Multiple Choice
Circle the correct answer(s):

1. The first task at the scene of the accident is:
   a. perform triage and tagging of casualties
   b. identify patients who require immediate attention
   c. give first aid to victims requiring basic resuscitation
   d. establish a liaison with hospitals that will receive victims
   e. determine the magnitude of the disaster

2. Triage begins when victims are encountered by:
   a. search and rescue personnel
   b. local survivors
   c. rural hospital personnel
   d. base hospital personnel
   e. emergency room personnel

3. An injured person, who was tagged green at the site of disaster because of minor injuries detected, arrives unconscious at the emergency room. He should be tagged with one only:
   a. black tag
   b. green tag
   c. red tag
   d. yellow tag

4. The practice of first aid includes:
   a. wounds and hemorrhages
   b. burns
   c. accident prevention
   d. normal births
   e. all of the above
   f. a, b, d

True/False
Indicate T or F:

__ 5. If there are no red-tagged patients, green-tagged patients with apparently fatal injuries become red-tagged candidates.

__ 6. Yellow-tagged patients include both fatally injured victims and people with minor injuries.

__ 7. The staff of health posts and centers provides first level care when a disaster occurs in a rural area.

__ 8. Resources for on-site medical care are mobilized prior to formal implementation of a hospital's emergency plan.

__ 9. Triage is based on the seriousness of injuries.

__ 10. An example of a red-tag problem would be a deep abdominal injury.

__ 11. Serious fractures of the pelvis and thorax would be tagged yellow.

__ 12. First level care refers to relief and first aid offered to victims at the disaster site.

Answer Key

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Lesson 4 - Organization of Rural Health Services for Disaster Situations

Study Guide
This lesson describes problems and limitations involved in organizing and planning for sudden natural disasters in remote communities. It stresses the importance of preparing local people to deal with their own problems and of organizing the available resources within the community. It also lists some actions that can be taken in disaster-prone areas.

Learning Objectives
• List two major limitations in planning for disaster management of health services in remote communities and rural areas.
• Identify the most important predisaster activity that can be carried out in these areas.
• List five subjects that should be taught in remote communities and rural areas to prepare people to cope with sudden natural disasters.
• Be familiar with small community human resources available for providing health services in disaster situations.
• Realize that human behavior following a natural disaster is normally positive and of great value in coping with problems caused by the disaster.

Learning Activities
• Review the list of potential human resources in a small community that appears in the chart below.

Evaluation
Complete the Self-Assessment Test.

Human Health Resources

Some or all of the following human health resources may be present in a small community. They should be included in the planning and organization required to prepare for disasters.

Physicians
Nurses
Health workers
Nursing auxiliaries
Dentists
Sanitary inspectors
Health educators
Social workers
Health promoters
Practical midwives
Healers
Practitioners of traditional medicine
Pharmacists
Lesson 4 Self-Assessment Test

Multiple Choice
Circle the correct answer(s):

1. Which of the following subjects should be included in any rural health training program for disaster preparedness:
   a. first aid  
   b. search and rescue  
   c. camp organization  
   d. all of the above

2. All of the following are reasons for treatment of disaster casualties in or near the home except:
   a. cost reduction  
   b. travel reduction  
   c. anxiety (trauma) reduction  
   d. reduction in need for training

True/False
Indicate T or F:

__ 3. In the absence of physicians, other health professionals such as nurses, dentists, dental assistants and paramedics should never perform a physician's task in a disaster situation.

__ 4. For at least six hours following an earthquake, most victims will be dazed, in shock, and unable to cope with even the most elementary tasks.

__ 5. Many problems in responding to disasters are brought about because of misconceptions held by the helping organizations themselves.

__ 6. Disaster management planning in rural areas may be hampered by limited staffing and communication equipment inadequacies.

__ 7. Predisaster training is more important in cities than in isolated communities and rural areas.

__ 8. Buildings in rural areas are subject to earthquake damage because regulations calling for sound construction are lacking.

__ 9. During an emergency, health personnel may rely on support from members of the community.

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| 9. T |
Lesson 5 Organization of Health Care Facilities for Disaster Situations

Study Guide
Health care facilities and their staffs must function at peak operating efficiency and capacity to cope with mass casualties at times of sudden disasters. This lesson describes the principles and procedures involved in developing a disaster plan to accomplish this.

Learning Objectives
• Understand the general principles involved in planning for disaster situations in health care facilities.
• List the three principal objectives of a disaster plan developed for a health care facility.
• List the five characteristics of such a plan.
• Realize that a plan must provide specific actions to be taken during the periods of alert, impact, emergency, rehabilitation, and reconstruction.
• Know the six basic services that must be assured if a health facility is to function in carrying out its disaster plan.
• Describe the five functions of a disaster plan committee.
• List four ways in which the number of available beds can be increased.
• Understand the factors a hospital must analyze in defining its operational capacity in times of internal or external disaster.

Learning Activities
• Read pages 25-34 in the manual.
• Review pages 92-100 in the manual (Annex 3, 4, 5).

Evaluation
Complete the Self-Assessment Test.
**Lesson 5 Self-Assessment Test**

**Multiple Choice**  
*Circle the correct answer(s):*

1. A hospital emergency plan for disaster situations should be:  
a. familiar only to management  
b. well organized and rigidly structured  
c. based on probable demand and resources available  
d. kept simple by paying minimal attention to community opinion  
e. aimed at every aspect of a disaster  

2. The *ultimate* purpose of a disaster plan is:  
a. to prepare institutional resources for optimal performance  
b. to be functional, flexible and easy to implement  
c. to make the community aware of the importance of the plan  
d. to be a part of a regional disaster plan  
e. all of the above  

3. What are the most important issues to be addressed in a hospital's disaster emergency plan:  
a. probable demand for services  
b. available resources  
c. hospital location  
d. a and b  
e. b and c  

4. Among the basic health facility services that must be assured for any disaster response are:  
a. water and sewage  
b. electricity and gas  
c. transportation and communications  
d. a and b only  
e. a, b, and c  

5. One function of a hospital disaster plan committee is to:  
a. give final approval to the proposal submitted by the chairperson  
b. be sure the plan can function autonomously without outside help  
c. arrange for drills and simulation exercises  
d. accommodate the plan to the hospital's budgetary program  
e. assign responsibility for the plan's execution to personnel outside the committee  

**True/False**  
*Indicate T or F:*

6. Disaster planning includes measures to lift bureaucratic barriers.  

7. In a disaster, all current patients in hospitals in the affected area should be discharged or transferred to other facilities.  

8. Disaster vulnerability of the hospital's physical structure need not be part of a hospital disaster plan.  

9. A hospital disaster plan should show the location of drains and of sewage and solid waste outlets.  

10. Heliports should be considered in disaster planning.  

11. A hospital emergency plan should be coordinated with similar plans in other institutions.  

12. During a disaster situation, standard procedures for management of supplies can be suspended to insure prompt utilization.  

**Answer Key**

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Lesson 6 Implementing the Disaster Plan in a Health Care Facility

Study Guide
This lesson presents a detailed, complex description of the procedures, sequence, and roles of personnel involved in implementing a disaster plan. It clearly demonstrates the chaos and confusion that would result without such a plan. The student will not be accountable for all of the details, but rather for the concepts they represent. If the student becomes involved in developing a disaster plan, this lesson will serve as a valuable reference.

Learning Objectives
- Understand the importance of a clearly defined, detailed procedure for declaration that a disaster plan is in operation.
- Appreciate the complexity of alerting units and departments that the disaster plan is being put into immediate operation.
- Know how the triage procedure at the health care facility functions.
- Describe the roles of the triage, major treatment, and minor treatment areas.
- Describe the roles of the switchboard operator, family information center, and director of public information in keeping the community informed.

Learning Activities
- Read pages 37-60 in the manual.
- Note pages 103 and 104 in the manual (Annex 8,9).

Evaluation
Complete the Self-Assessment Test.
Lesson 6 Self-Assessment Test

Matching
Match the individual with his or her responsibility under disaster conditions.

Individual

___ 1. supervisor in charge of hospital security
___ 2. switchboard operator
___ 3. chairperson of the hospital disaster committee
___ 4. hospital administrator

Responsibility

a. checks that a person has been assigned to handle the telephone during the disaster
b. sends a supply of patient identification tags to the triage area
c. determines the number of beds available and sees that needed off-duty personnel are mobilized
d. contacts all persons included in the disaster notification list

Hospital disaster plans should have clear notification procedures to follow. Match the individuals, who should be notified, with those who have the responsibility forgiving notification. A letter may be used more than once, or not at all.

To be notified/receive instructions

___ 5. senior resident in the emergency ward
___ 6. emergency ward
___ 7. chairperson of the disaster committee
___ 8. people in the emergency room
___ 9. assistant to the director of the hospital
___ 10. chief of operating rooms
___ 11. the highest local authority
___ 12. parking lot coordinator

Notifiers

a. switchboard operator
b. information center
c. emergency ward informant
d. head nurse
e. security supervisor
f. chairperson of the disaster committee
g. hospital administrator
h. operating room command post

True/False
Indicate T or F:

___ 13. The procedure for establishing a communications system in a hospital is different if a disaster situation occurs on a weekend instead of regular working hours.
___ 14. Duties of the women’s volunteer corps include transportation of patients.
___ 15. A doctor, a nurse, a stretcher bearer and a driver should accompany every hospital ambulance during a disaster.
___ 16. Under disaster conditions, a press area is set up in the hospital's administration offices.
___ 17. Hospital administrative staff wear green armbands in a disaster situation.
___ 18. The make-up of the personnel in a hospital triage area varies depending on the type of disaster.
___ 19. After obtaining sufficient information, the switchboard operator may declare the disaster plan in operation.
___ 20. During a disaster, the hospital switchboard operator will attempt to continue processing normal calls that do not interfere with emergency procedures.
___ 21. Each physician assigned to a triage area must have a copy of the disaster instruction sheet for emergency department staff.

Answer Key

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Lesson 7
Updating and Evaluating the Hospital Disaster Management Plan

Study Guide
This final lesson stresses the importance of frequent updating and evaluation of a hospital disaster management plan to reflect changes in personnel and resources and correct any failings in performance. The student will not be accountable for all of the detailed information presented but will be expected to understand the principles involved and the various methods available for evaluation and updating of a plan.

Learning Objectives
• Give two reasons for updating a hospital plan at least once a year.
• Understand the need to evaluate every element of the institution and the activities each is expected to carry out in implementing the plan.
• List the two main purposes of an evaluation.
• List the types of drills that may be used in evaluating a plan.
• List the three principal objectives of drills.
• Know the importance of involving external agencies and institutions in a drill evaluating a hospital plan.
• Understand the advantages that simulated disasters provide to a plan's evaluation.
• Understand the benefits and limitations that performance audits provide to a plan's evaluation.

Learning Activities
Read pages 63-73 in the manual.

Evaluation
Complete the Self-Assessment Test.
Lesson 7 Self-Assessment Test

Multiple Choice
Circle the correct answer(s):

1. The three principal objectives of a drill are to:
   a. train staff, develop flexibility in thought and response, and minimize response time
   b. define roles, develop flexibility in thought and response, and test participants' abilities to respond promptly and correctly under stress
   c. lay the groundwork for preparing a disaster management plan, involve participants in the decision-making process, and test knowledge and efficiency
   d. define roles, test knowledge and efficiency, and minimize response time
   e. train staff, detect any flaws in the plan, and minimize response time

True/False
Indicate T or F:

__ 2. Hospital disaster plans should be updated frequently.

__ 3. A disaster plan that stood the test of a real disaster need not be evaluated and updated.

__ 4. An in-service drill tests how well the entire hospital performs as a treatment center for emergency care of mass-casualty victims following a disaster.

__ 5. If staffing changes have been made, the hospital disaster plan should automatically be updated to reflect these changes.

__ 6. Evaluation of the disaster plan should not take place while the disaster situation is occurring.

__ 7. Including institutions (armed forces, the Red Cross, fire departments) in hospital disaster drills will insure coordination.

Answer Key

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Health Services Organization in the Event of Disaster

1983 Scientific Publication No. 443
Pan American Health Organization (PAHO)
Pan American Sanitary Bureau, Regional Office of the World Health Organization
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HEALTH FOR ALL THE YEAR 2000

In 1977, the World Health Assembly decided that the main social target of the governments and of WHO should be the attainment by all people of the world by the year 2000 of a level of health that would permit them to lead a socially and economically productive life, that is, the goal popularly known as “health for all by the year 2000.”

In 1978 the International Conference on Primary Health Care (Alma-Ata, USSR) declared that, as a central function of the national health system and an integral part of economic and social development, primary health care was the key to achieving that goal. Subsequently, the governments committed themselves - at the global level at the World Health Assembly, and at the regional level at meetings of the PAHO Governing Bodies - to implement the resolutions adopted for attaining health for all. In the Americas the high point of these mandates was reached on 28 September 1981 when the Directing Council of PAHO approved the Plan of Action for implementing the regional strategies for health for all by the year 2000. These strategies had been approved by the Directing Council in 1980 (Resolution XX) and today constitute the basis of PAHO’s policy and programming, and represent in addition the contribution of the Region of the Americas to the global strategies of WHO.

The Plan of Action approved by the Directing Council contains the minimum goals and regional objectives, as well as the actions governments of the Americas and the Organization must take in order to attain health for all. The Plan, continental in nature, is essentially dynamic and is addressed not only to current problems but also to those likely to arise from the application of the strategies and the fulfillment of regional goals and objectives. It also defines priority areas that will serve as a basis, in developing the program and the necessary infrastructure, for national and international action.

The exchange and dissemination of information constitutes one of the priority areas of the Plan of Action. PAHO's publication program - including periodicals, scientific publications, and official documents - is designed as a means of promoting the ideas contained in the Plan by disseminating data on policies, strategies, international cooperation programs, and progress achieved in collaboration with countries of the Americas in the process of attaining health for all by the year 2000.

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Chapter 3: Organization of medical care units in the disaster area
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Chapter 6: Implementing the plan in hospitals
Chapter 7: Updating and evaluating the hospital disaster management plan
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Preface
Natural disasters frequently cause major problems which affect a population's health and hinder a nation's socioeconomic development by draining its scarce financial resources in an effort to repair damages. Often, those damages are so great that neither the efforts of the stricken country nor international cooperation suffice for complete reconstruction and rehabilitation. The Region of the Americas is constantly being struck by natural disasters such as earthquakes, hurricanes, volcanic eruptions, floods, tornados, and landslides among others, which inflict not
only a large loss of life, but also damage the service infrastructure, crops, and livestock, and cause ecological disturbances that generate incalculable economic losses.

Practically no country is immune to the risks of nature and, while scientific progress has contributed much to the study of these phenomena, the technology is as yet not available to accurately predict their occurrence; an exception to this is atmospheric phenomena, which can be detected early enough to take some protective measures.

The effects disasters have on the health field cover a broad range of implications stemming not only from the demand for the immediate care of victims, but also from the medium- and long-term effects of the intermittent suspension of basic sanitation services, food shortages, and the interruption of disease surveillance and control programs; these aspects require coordinated efforts and the efficient use of knowledge and resources.

There are probably few areas in which a concerted effort in the health sector is more critically important than in the postdisaster management of emergency measures. Moreover, sudden disasters require that health professionals muster all their technical abilities and energies to solve problems under critical conditions in which facilities and materials are not always available, as they are in normal situations.

The organization of medical care is unquestionably the focal point for coordinating the health sector’s response to this host of complex needs, since in relief operations prompt care is critically important for saving lives.

It is worth noting that, however timely the health care response may be, its effect can be nullified if it is disorganized and fragmented, hence inefficient and ineffective. A prompt response must provide first aid and organize a tiered system of care to victims using appropriate techniques as part of a group of coordinated and rationalized efforts.

Institutional organization is of equal importance, for it is not enough to have highly complex and sophisticated physical structures and adequately trained human resources if they are not properly structured to meet the needs that arise for disaster care in or outside a hospital. Hospital establishments must have contingency plans for different kinds of disasters and keep their personnel in continual training. On the other hand, it should be taken into account that a major disaster will require the cooperation of every institution in the health sector. Coordination of public and private institutions in this sector is yet another aspect that deserves special consideration, particularly in countries of the Region where government resources are not always sufficient.

Pursuant to the Resolutions of its Governing Bodies, the Pan American Health Organization is giving special attention within its technical cooperation activities to developing national disaster preparedness programs in the health area. In this context, PAHO has produced guides and technical manuals for the various disciplines involved in planning and coordinating health aid in the wake of natural disasters.

This manual, which complements a series of scientific publications on disaster preparedness issued by PAHO, is aimed at the physician, the paramedic, and the health administrator, and provides general guideline for the organization of health services and technical standards for mass care of disaster victims.
While the manual is based on the traditional organization of health services in Latin America and the Caribbean, its technical concepts are applicable to other countries in and outside the Region of the Americas.

It is hoped that this manual will support the countries’ efforts to develop preparedness plans which will mitigate the effects of natural disasters, and that through this effort, a significant contribution will be made to the Governments' unanimously stated aim of attaining "Health for All by the Year 2000."

Carlyle Guerra de Macedo
Director

Acknowledgments
This publication is the result of valuable contributions by a team of professionals who have made available their knowledge and field experience. An extensive specialized bibliography and familiarity with the health systems in most of the countries of the Region have served as a basis for preparing this manual, which is intended to serve as a guide in the organization of health services in the event of disaster.

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Chapter 1: Introduction

The vast majority of natural and man-made disasters occur suddenly and unexpectedly, disrupting normal health care systems. The importance of preventive planning for disaster management is undeniable. Good intentions and interest in the welfare of others are not enough for dealing with the serious consequences often inflicted upon the population by a disaster.

Experience has shown that mistakes are made in the absence of proper organization or of a staff prepared to act in accordance with a prearranged plan, or when rescue operations are not efficiently directed, coordinated, and controlled. Such mistakes lead to confusion, delays, omissions, and duplication of effort, complicating the already difficult task of those responsible for the speedy mobilization of all available resources.

A country's health systems and public health infrastructure must be organized and ready to act in disaster situations as well as under normal conditions and must be cognizant of the type of measures to be taken in the event of a disaster. These will differ according to the severity of the disaster's impact on the national health system.

The health care preparedness plan for disaster management should be an integral part of the overall national disaster preparedness plan. In addition, there should be all the necessary elements to ensure the greatest possible coordination and timing, thereby avoiding misuse of resources and duplication of effort and promoting optimal benefits.

It should be kept in mind that many sectors will be involved in the national plan. These will include, among others, meteorology services (including hydrology and seismology), national planning, public works, utilities (electricity, water, gas, sanitation), construction, food, industry, finance, communications, transportation, education, public information, relief and rehabilitation, social work, public health, Armed Forces, civil defense, police, fire departments, Red Cross Societies, private voluntary groups, etc.

Each agency in these sectors will have to develop its own specific action plan for executing the tasks assigned to it within the national plan. Its activities should be arranged under three distinct chronological stages: a) predisaster preparedness, b) action during the disaster, and c) postdisaster rehabilitation.

The national plan and its sectoral counterparts must be so designed as to be truly national in scope, embracing every level from the country's most sophisticated centers to its least complex and most elementary rural outposts.

The national health care preparedness plan for disaster management should also involve every organization and sector directly or indirectly performing health activities in the country. Specific responsibilities should be assigned in the plan to each of these subsectors, which in turn will have to develop their own equally specific programs, setting forth clear and precise objectives and targets, the sum total of which should precisely match the objectives stated in the national plan.

At the rural level, the health care preparedness plan for disaster management should be simple and consist of practical, easy-to-implement measures. The priority aspect should be training of medical and paramedical personnel in rural areas and training and motivation of communities.
Purpose and scope

The purpose of this manual is to furnish technical information necessary for the preparation of plans to enable health services to provide an effective response in the management of massive casualties following a disaster.

Based on the existing structure of each country's health system, this manual attempts to cover the fundamental features involved in the preparation and coordination of emergency plans which are consistent with the characteristics of the health infrastructure and effectively provide a prompt and adequate response to disaster-created needs in facilities ranging from humble health posts to sophisticated district, regional, or metropolitan hospitals.

The general planning objectives are to:

1. Coordinate the use of resources and make it more rational so as to avoid duplication of activities and functions.
2. Keep a current inventory of human, material, and institutional resources in the medical care area.
3. Carry out training activities for health-area personnel, volunteers, and staff of the emergency care system or the civil defense system.
4. Ensure the establishment of effective coordination and cooperation between national and regional organizations (public as well as private) in the implementation of the national disaster management plan.
5. Orient community action in disaster situations.
Chapter 2: Organization of the Health System

Most health systems in Latin America are based on a medical care infrastructure consisting of health posts, regional, provincial, or statehospitals, and national or metropolitan referral hospitals, along with specialized care units. In such an organization, the system of referral, control, and supervision is properly delineated, categorized, and supervised. In the event of a disaster affecting that system, its basic structure should be maintained as far as possible but it should be adjusted and strengthened according to the area affected and the magnitude and extent of the disaster.

The organization of health care centers for disaster situations should be planned in advance and should be based primarily on the country's existing normal health and medical care structure and systems at the regional and local levels. The arrangements should take into account the roles to be played and responsibilities to be assumed by health centers unaffected by the disaster.

It should be emphasized that the health care organization for disaster situations should include not only the country's official health system (generally consisting of a network of centralized and decentralized institutions), but also the autonomous, semiautonomous, and private health facilities, so that all of them together may immediately become part of a unified national system for dealing with disaster situations.

This recommendation must not be relegated to the plane of the "ideal"; instead, all the necessary mechanisms should be structured through the national emergency committee or civil defense system so that the moment an area or the entire country is hit by a disaster all those institutions will automatically begin to operate as part of the national health care system for disaster situations.

Regionalization of health services should be a feature of the health infrastructure in its national strategy. In times of disaster, regionalization allows for a better use of resources, including transportation, communications, and supplies, and thereby enhances the effectiveness of patient care.

As part of the regionalization, arrangements should be made for coordination among the medical care units of the Ministry of Health, the Social Security System, and the decentralized and private health service facilities. A unified command must be established in each region to execute orders, set existing plans in motion, and see that there is proper liaison of the health services with the national emergency committee or civil defense system.

The establishment and satisfactory operation of levels of authority and coordination are matters of vital importance, as any failure or disruption of discipline and coordination in the development and application of the plans for the services can only lead to poor performance and higher costs.

Coordination, communication, and supervision are fundamental tasks in implementing the national health care plan for disaster management. The plan should be coordinated in advance with the national emergency or civil defense committee with a view to its use as the committee's implementation tool.
It is important that authentic leaders be identified and trained before disasters occur. Such leaders should be authority figures respected by the medical profession, the population at large, and the established authorities. They should possess the requisite knowledge, communication skills, and authority to make regionalization work and contribute to the effectiveness of services by the health care units in accordance with predeveloped plans. In addition, they should be able to improvise, work out, and develop emergency procedures consistent with the needs.

Special mention should be made of the role of voluntary agencies in disaster situations, and it should be emphasized that such agencies, whether national or international, are to adapt themselves and their activities to the plans and assignments conveyed to them by the national emergency or civil defense committee, in general, and the health care committee for disaster situations, in particular.

Hospitals will have a better chance to deal successfully with a disaster situation if there are arrangements for coordination among medical care facilities.

Sectorization of cities and demarkation of the service area of each hospital and health center are important factors in the structuring of emergency plans.

A clear definition of levels of care in terms of the category, location, and degree of sophistication of health institutions should also facilitate the planning of concerted actions as successive phases of an overall plan of medical care to cope with an emergency. It is here that each institution will have to shoulder a responsibility depending on the circumstances and the magnitude of the disaster.

The regionalization system calls for the establishment of hospital zones and areas, in each of which a "lead hospital" or "regional base hospital" will bear the responsibility for organizing satellite health care units in the region.

**Classification of medical care centers for disaster situations**

The need to organize a nationwide medical care network for disaster situations requires a definition of the various categories of health service institutions.

Starting from the premise that the hospital should be the coordinator of medical care services in the event of major disasters, the key considerations in this classification should be capacity and funding, interconnection of the institutions forming the medical care network, and regional characteristics. The classification need not be related in any way to the country's breakdown by political subdivisions.

The following terms will be used in the classification of medical care centers:

*National Medical Center* - This would be the highest level hospital center, with human and physical resources for such subspecialties as traumatology, burns, ophthalmology, etc.
**Lead Hospital or Regional Base Hospital** - The medical care facility that would assume responsibility for hospital care in a region, state, province, or department; would coordinate emergency care with other centers having smaller resources or capacities.

**Satellite Medical Care Units** - Smaller medical care establishments, with hospital capacity but with only limited human and material resources; such units would provide services in obstetrics, pediatrics, surgery, and medicine, coordinating their work with the appropriate lead hospital or regional base hospital.

**Special Medical Care Centers** - Facilities with hospital capacity but with action limited to a particular specialty or specialties; in an emergency situation, such facilities could be used as satellite medical care units or as evacuation centers for patients under observation, or for postoperative patients who have no complications or where conditions can be treated in the facility in question, relieving pressure on the regional hospitals.

**Medical Care Posts** - This category includes primary care centers with no hospital capacity, situated in rural or suburban areas, and possessing only limited human resources; depending upon the circumstances, they would operate either as first aid stations or casualty sorting centers.
Chapter 3: Organization of Medical Care Units in the Disaster Area

Depending upon the location and magnitude of the catastrophe, first-level care is generally organized at the disaster site to provide relief and first aid to the victims. When the disaster occurs in a metropolitan area, the first-level care will be provided by ambulance personnel, firefighters, police, Red Cross, and other medical or paramedical staff. If the disaster occurs in a rural area far removed from a city or town, staff from the nearest health posts and centers will assume responsibility for aiding the victims in the early stages of the emergency.

Regardless of the type of disaster involved, it is imperative that minimal standards of organization and coordination be observed at the scene, in order to avoid confusion and impairment of the relief effort.

The standards to be observed should be directed to:

1. Establishing a command post to coordinate emergency activities, monitor the utilization of available resources, and prevent role conflicts.
2. Promptly assessing the disaster's magnitude and the number, location, and urgent requirements of casualties.
3. Selecting an area or zone to be used for first-level classification (triage) and identification (tagging) of casualties prior to their removal to medical care centers. If the magnitude of the disaster so warrants, one or several additional spaces at the site of the catastrophe should be designated for second-level classification of the wounded.
4. Administering first aid to the wounded, including stabilization, hemorrhage control, clearing air passages, and, in some cases, blood-volume replacements. In administering first aid, the priorities assigned in the triage area must be observed.
5. Establishing lines of communication with regional hospitals or satellite units to alert them of the need to activate and implement their respective emergency plans for mass care of the wounded.

Once the hospitals and health care centers are aware of the disaster and have activated their emergency plans, they will mobilize their resources for on site medical care. Depending upon the magnitude of the disaster, they will send out either medical teams or rescue teams trained in first aid.

Mobile Hospitals

In the event of a very serious disaster that has damaged the physical plant of hospitals or has inflicted injuries exceeding the medical care capability of available hospitals, the use of mobile hospitals may be justified as referral or treatment facilities, or simply as first aid centers.

A precautionary note is in order here: experience has shown that mobile hospitals are not particularly effective because of the high cost of moving and installing them, their inadequate degree of autonomy in terms of material and human resources, and their complexity.
It is therefore recommended that, prior to setting up a mobile hospital, consideration be given to making it self-sufficient. The unit must be staffed with medical, nursing, and support personnel and stocked with the necessary supplies, drugs, emergency materials, and medical and surgical supplies to treat the wounded. It should also come with the food and other supplies that its own staff will need, so that the limited supplies available for meeting the community's requirements are not diverted for that purpose.

Coordination of the functions of mobile hospitals should be under a unified local command that can deploy and support these units and their operations in accordance with the national health plan for disaster situations.

When developing their disaster emergency plans, hospitals should consider the alternative of remaining in operation even if they have suffered structural damage as a result of a disaster.

**Mobile Hospitals for First Aid**
A first aid hospital should be a daytime care center providing ambulatory patients with first aid and treatment for contusions, lacerations, sprains, and minor injuries and maintaining such primary medical care services as necessary for residents of the disaster area who become ill.

**Mobile Hospitals for Referrals**
This should be a unit with a limited medical and paramedical staff that can be reinforced by volunteers. It will receive patients who have been treated and only require minimal medical supervision or simple nursing care before returning to the community. As with mobile hospitals for first aid, they should be self-sufficient.

A unit of this kind is indispensable for expediting hospital treatment; a mobile first aid hospital set up in the disaster area, as well as other mobile hospitals and teams, will serve to replace and/or reinforce the disaster area's permanent medical care units, depending on the completeness of the latter's physical plant, staff, and equipment.

**Search and Rescue Units**
The basic prerequisite for using rescue units is that their personnel be properly trained in first aid and that the unit have the necessary organizational ability to move immediately to the scene of the disaster.

The mission of these units is to rescue the injured and administer first aid so that victims may be transported to the medical care center closest to the disaster area.

At the same time, these teams perform an initial triage or classification of the injured. For that purpose, they should carry a supply of tags (see illustration in Annex 7).

If warranted by the extent of the damage and the number of casualties and by the scarcity of trained people for search and rescue operations, posts for care of the injured should be established at points around the periphery of the disaster area so that casualties can be transported to them.
Triage and Tagging of Casualties

The classification or grouping of mass casualties based on the medical criterion of chance of survival (triage) is a necessary procedure when a large number of casualties must be cared for with limited medical resources, since most hospitals cannot accommodate stocks of supplies sufficient for dealing with public emergency conditions.

Decisions as to which cases can wait for treatment, which should be taken to more appropriate medical units, and which have no chance of surviving must be made at the scene of the disaster. The grouping is based on the benefit that the casualties can expect to derive from medical care, not on the seriousness of the injuries. In other words, the screening procedure differs radically from that followed under normal conditions, in which the most seriously injured are given priority regardless of prognosis.

Triage is a continuing process that begins at the disaster site - the first level - where the priority of care to be given the casualty is determined. The second level of triage may take place at another site or at the entrance to the hospital, and yet a third level may be performed inside the hospital before the injured are transferred to the treatment areas.

Triage at the Scene of an Accident

Ideally, a physician should be taken in the ambulance to the scene of the accident to take charge of the triage area where all casualties, regardless of the extent of injury, will be processed. The doctor at the triage area will also assist in matters having to do with documentation and communication - important aspects of disaster management which are very difficult to set up in the first hours after the accident.

The first task is to determine the magnitude of the disaster. This may be done with the help of a police officer who happens to be available. In addition, liaison should be established with the hospitals that will receive the victims and with the ambulances, civil defense authorities, police, firefighters, Red Cross, Army, Navy, Air Force, and other agencies providing emergency aid.

The next step is to identify those patients who require immediate attention and dispatch them promptly to the hospital.

Treatment at the scene of the accident should be limited to basic resuscitation procedures needed to save lives. If a number of patients require these measures or are trapped and seriously injured, the medical triage officer at the scene of the accident will request the assistance of a mobile medical unit.

When the number of wounded is critical and resources are inadequate, an unusual procedure assumes vital importance: a distinction must be made between those who may respond to treatment and those who are bound to die. An adequate ambulance team should be reserved for the latter.

All deaths should be certified, so as to avoid losing time by using medical personnel to confirm them.
Tagging
Whenever possible, the identification of patients should be accomplished concurrently with triage. This is done by attaching a tag to each patient, usually color-coded (see Annex 7) to indicate a given degree of injury and the priority for evacuation.

Red Tag
This tag signifies that the patient is a first priority for evacuation. Red-tagged patients need immediate care and fall into one of the following categories:

1) Breathing problems that cannot be treated at the site.
2) Cardiac arrest (witnessed).
3) Appreciable loss of blood (more than a liter).
4) Loss of consciousness.
5) Thoracic perforations or deep abdominal injuries.
6) Certain serious fractures:
   a) pelvis;
   b) thorax;
   c) fractures of cervical vertebrae;
   d) fractures or dislocations in which no pulse can be detected below the site of the fracture or dislocation;
   e) severe concussion;
   f) burns (complicated by injury to the air passages).

Yellow Tag
Identifies patients that receive second priority for evacuation. Such patients need care, but their injuries are not life-threatening. They fall into the following categories:

1) Second-degree burns covering more than 30 per cent of the body.
2) Third-degree burns covering 10 per cent of the body.
3) Burns complicated by major lesions to soft tissue or minor fractures.
4) Third-degree burns involving such critical areas as hands, feet, or face but with no breathing problems present.
5) Moderate loss of blood (500-1,000 cc).
6) Dorsal lesions, with or without injury to the spinal column.
7) Conscious patients with significant cranioencephalocerebral damage (serious enough to cause a subdural hematoma or mental confusion). Such patients will show one of the following signs:
   a) secretion of spinal fluid through ear or nose;
   b) rapid increase in systolic pressure;
   c) projectile vomiting;
   d) changes in respiratory frequency;
   e) pulse below 60 ppm;
   f) swelling or bruising beneath the eyes;
   g) anisocoric pupils;
   h) collapse;
   i) weak or no motor response;
   j) weak reaction to sensory stimulation (profound stupor).
**Green Tag**

Used on patients who are given third priority for evacuation and who fall into the following categories:

**Minor Lesions**
1) Minor fractures (fingers, teeth, etc.).
2) Other minor lesions, abrasions, contusions.
3) Minor burns:
   a) second-degree burns covering less than 15 per cent of the body;
   b) third-degree burns covering less than 2 per cent of the body surface;
   c) first-degree burns covering less than 20 per cent of the body, excluding hands, feet, and face.

**Fatal Injuries**
1) Second- and third-degree burns over more than 40 per cent of the body, with death seeming reasonably certain.
2) Second- and third-degree burns over more than 40 per cent of the body, with other major lesions, as well as major fractures, major craniocerebral lesions, thoracic lesions, etc.
3) Cranial lesions with brain tissue exposed and the patient unconscious;
4) Craniocerebral lesions where the patient is unconscious and has major fractures.
5) Lesions of the spinal column with absence of sensitivity and movement.
6) Patient over 60 years old with major lesions.

It should be noted that the line separating these patients from red-tag casualties is very tenuous. If there are any red-tag patients, this system will have to be followed. If there are none, the yellow-tag patients with apparently fatal injuries become red-tag candidates. The reason is simple: if there are many red-tag patients with a chance to survive and there are yellow-tag patients that cannot be saved because of their injuries, the time spent on the dying wounded could be better spent on the patients with a chance to survive.

**Black Tag**

Black tags are placed on the dead, i.e., casualties without a pulse or respiration who have remained in that condition over 20 minutes or whose injuries render resuscitation procedures impossible.

**Evacuation Procedures under the Following Conditions:**

1) Casualties not trapped or buried. Evacuate in the following order:
   a) red-tag casualties;
   b) green-tag casualties;
   c) yellow-tag casualties;

2) Casualties trapped or buried. Evacuate in the following order:
   a) red-tag casualties;
   b) green-tag casualties;
   c) yellow-tag casualties;
   d) black-tag casualties not trapped or buried;
   e) trapped black-tag casualties
Chapter 4: Organization of Rural Health Services in Disaster Situations

Primary health centers located some distance away from the major referral centers will be the main focus of this chapter. These small health centers stress primary health care, and their infrastructure is such that their activities are basically limited to disease prevention and health promotion. Cases requiring specialized treatment are evaluated and referred to other, more specialized, centers.

When a natural disaster hits small, widely scattered communities, the demand for health services increases considerably. This means that the health centers in the particular service area have to assume the immediate responsibility for dealing with the situation. Against this background, an overview of the principal characteristics of the normal organization of health services in rural areas is in order.

Resources and infrastructure

It is obvious that there are many different patterns of organization and utilization of human resources; in general, however, health centers have general physicians on their staff or are visited periodically by them. In most cases, rural medical stations are used as bases to which newly-graduated physicians are assigned to fulfill the requirement of serving in a rural area.

Nursing staff is nearly always scarce and is concentrated in the large urban areas. This explains the use of nursing auxiliaries to fill positions in rural areas.

The team is at times supplemented by a dentist, dental assistant, sanitation inspector, health educator, social worker, and perhaps a health promoter recruited in the community itself.

In the more remote places where the population is smaller, there may be a health post, generally staffed by a nursing auxiliary or by a health promoter; here, activities are strictly limited to health promotion, disease prevention, and first aid. Such units are primarily channels of referral to the closest health center.

But the chain of health services does not end at that level; it frequently extends into the heart of the community itself, where there are practical midwives, healers, and all the other elements of traditional medicine.

The physical area available in a rural health center has been designed in keeping with the services provided. The construction industry is now subject to various rules and regulations aimed at ensuring that the structure of buildings will withstand the onslaught of natural disasters, especially earthquakes, but these regulations are not always fulfilled in practice, much less in rural areas. Furthermore, many small health centers operate in local buildings or houses that generally do not meet safety requirements. This means that in a serious natural disaster it is possible that the building housing the health center will be damaged, leading to all the consequences and complications resulting from improvisation.
The available equipment and furnishings are rather simple. The arsenal of drugs is not complicated and normally does not exceed 100 drugs.

**Referral and communications system**

It should be kept in mind that the means of communication and access to remote rural areas are inadequate and slow. This hinders the movement of patients even under normal conditions; obviously, the problem is accentuated by obstacles created by earthquakes, hurricanes, floods, or landslides. The normal pattern of referral is nearly always from the minimal post to the health center and from the health center to the more specialized establishments.

In some countries special vehicles for the deployment of health personnel and movement of patients in the field have been provided to rural health programs. But in many other countries this facility has not been provided and accordingly staff will have to be moved by whatever modes of transportation exist in the area. Very often the means of transportation is a pack animal or makeshift canoe. A common sight is a campesino transporting a patient on an improvised stretcher, trudging his long and weary way toward the nearest health center.

A highly critical situation exists where communities remain completely isolated, with radio as their only means of communication. Access to these communities is difficult even in normal times, and they can only be reached by small airplane or helicopter.

**The community**

When a major natural disaster hits communities in rural areas, seriously injuring the residents, usually only small health centers with limited equipment, basic staff, and serious communication problems are available. It is possible that the area will remain isolated for several days. This hampers transfer and external support systems and leads to a breakdown in the service supply/demand ratio, adding one more problem to the disaster.

The impact and its consequences are generally more than can normally be handled, and a careful study of all the alternatives for making maximum use of the scarce resources available should be undertaken.

It will be necessary to train the health personnel to deal with the situation in the best possible way, but what is perhaps most important is to teach and train the community itself, so that at a given time it will join together actively and in an organized way as an important, and indeed, at times the only, available element of support for the existing medical and health services.

The subjects that should be dealt with and widely taught are: first aid, rescue of casualties, transportation of the injured, mutual aid, census-taking and the search for the missing, camps for the victims, the organization of brigades, and postdisaster rehabilitation activities.

In any kind of natural disaster the first hours are the most critical. Panic immediately sets in; the population is disoriented and at first will not know what to do or how to organize, even if it has received previous training. This is understandable because of the strong emotional impact, which will gradually subside until eventually a better and more organized way of reacting is achieved.
The Disaster Committee, which will have been structured in the town itself and surrounding communities, will have a very important role to play. The Committee must assume its duties as quickly as possible and coordinate and direct action in the area.

The medical officer in the clinic will have to put into practice the plan that was developed before the disaster, and his staff should be thoroughly acquainted with it.

Photo: C. de Ville de Goyet/PAHO

In disaster-prone areas at least, it is desirable that a minimum supply of goods, sufficient for dealing with the situation, be kept on hand at all times. The make-up of these supplies will depend on the type of disaster common in the area.

It will sometimes be necessary to improvise mass patient care centers in large spaces such as school classrooms, churches, or other similar buildings, which should be determined in advance.

Whenever possible, it is best to treat casualties in their homes. This obviates the need for an immense concentration of patients in the referral hospitals, reduces costs, and also eliminates the need for extensive travel by patients and family members.

It is interesting to note that Indian patients suffer a certain trauma when taken to a large city hospital where the environment is totally alien to them.

It should further be observed that family and friends often perform very effectively not only by keeping the patient company but also by acting as nurses in the patient's home.

The shortage of medical personnel that will undoubtedly occur should be made up by nurses, dentists, and paramedics who will have to perform more than one function.

Nursing auxiliaries and health promoters in small communities will also have to play a somewhat more important role. They will screen casualties to determine those who really need to be taken to the health center.

If adequate means of communication are available, telephone consultations can be made; this will also facilitate prompt census-taking and a general assessment of the situation. The residents themselves, acting in accordance with standards they learned during their training, will spontaneously organize brigades to rescue victims, give first aid, transport the wounded, distribute relief supplies, etc.

The campesino's sense of mutual and community support in rural areas normally comes into play at a very early stage, especially in cases of calamitous disasters, and is extremely helpful in the recovery and rehabilitation phases. Almost immediately the campesino rebuilds his fragile dwelling or improvises another one and then gradually begins to return to his normal activities. It is very important to keep this in mind when preparing calculations of relief to be provided to persons in need.
Chapter 5: Organization of Medical Care Centers for Disaster Situations

All hospitals, health centers, and posts, according to their rank within the structure of the national health system, should have an emergency plan. The structure of the plan is closely related to the importance and rank of each hospital and the role it plays in the national health program, based on its size, the area it serves, and the disaster-prone area.

In disaster planning, consideration should be given to the periods of alert, impact, emergency, rehabilitation, and reconstruction; however, while some disasters may have an alert period lasting days or possibly even weeks, that is not the time the medical care center should begin to develop a plan for managing a possible disaster; such plans should be conceived, studied, and rehearsed before the disaster occurs.

**General principles of hospital emergency planning for disaster situations**

1) The plan should be easy to understand and should be widely disseminated.

2) The plan should consider any contingencies that may require changes in the health system. This means that it should be highly flexible if it is agreed that many types of emergency situations may occur.

3) In developing the plan, consideration should be given to the views of the medical staff, nurses, and administrative personnel of the hospital involved; opinions of community services (police, firefighters, volunteer groups, civil defense, etc.) should also be taken into account.

4) The plan should be essentially objective and limited to two specific aspects: probable demand and the resources that are available or can be mobilized.

5) The plan should be put into effect only when necessary.

**Plan for disaster situations occurring outside the hospital**

Each hospital should prepare a disaster-management plan based on its own operational capacity. The operational capacity of a hospital or health center may cover a range of services from first aid and immediate emergency care and subsequent transfer to definitive treatment.

The disaster plan should be developed in conjunction with other community emergency facilities for hospital outreach.

The planning should include consultation and review with the local civil authorities and with other medical institutions on establishing an effective command for appropriate action in the area. It should envisage the training of action teams to perform on site triage and distribute
casualties in such a way as to provide the most effective possible use of available services and capabilities.

The disaster plan should include provisions for:

1. Evaluation of a hospital's autonomy in terms of its services and its source of electricity, gas, water, food, and medical supplies.
2. An efficient system of alerts and staff assignments.
3. A unified medical command.
4. Conversion of all usable space into clearly defined areas for efficient triage, for patient observation, and for immediate care.
5. Prompt removal of casualties when necessary (after preliminary medical and surgical services have been performed) to the places where medical care facilities are more appropriate and definitive.
6. A special medical census for disaster cases.
7. Procedures for prompt transfer of patients within the hospital.
8. Security arrangements to keep curious persons from entering triage areas and to protect staff from hostile actions.
9. Prior establishment of a public information center. A public relations team with a means of communication to assist in providing an organized source of information. The hospital is responsible for keeping the community informed of its potential and limitations in disaster situations. The local police, rescue groups, and ambulance teams should be aware of the resources of each hospital.

**Plan for disaster situations occurring inside the hospital**

The hospital should have firefighting equipment. An intrahospital disaster plan and a plan for fires and other disasters should include evacuation procedures. The plan should be developed with the help of the fire department.

Some of the measures to be taken include:

1. Development of a plan for assigning personnel to specific duties and responsibilities.
2. Instructions on the use of alarm and sign systems.
3. Instructions on firefighting methods.
4. Directions as to the location of firefighting equipment.
5. System for notifying trained personnel.

All the staff of the hospital should be well acquainted with the plan. Fire drills and internal disaster exercises should be carried out at least once a year during each hospital shift, in order to:

1. Make certain that the staff on each shift is trained to carry out its assigned duties.
2. Make certain that the staff on all shifts is familiar with the hospital's firefighting equipment.
3. Assess the efficacy of the plan. Evacuation of patients to secure areas during the drill is optional.
1. An emergency or disaster occurs in a hospital when the resources for dealing with the situation are inadequate for immediate action. In such circumstances normal procedures should be abandoned and resources increased so as to expand hospital capacity.

2. It is the hospital's responsibility to maintain a continuing education and training program to ensure that proper action is taken promptly in the event of an emergency.

3. When the hospital receives more than 100 emergency cases simultaneously, it must plan a simplified treatment system; such a system is addressed to preventing loss of life, complications, deformities, infections, and delayed treatment. This policy should be previously discussed with the medical staff, who will decide on the actions to be taken at the time of a disaster and develop the hospital's disaster-management plan.

**Purpose and Objectives of the Plan**

The purpose of a disaster plan is to make it possible to attend, promptly and effectively, to the largest possible number of people requiring medical care, in order to reduce the number of deaths and disabilities and bring about recovery. The principal objectives are:

1. To prepare the staff and institutional resources for optimal performance in an emergency situation of a certain magnitude.

2. To make the community aware of the importance of the "disaster plan," how it is executed and the benefits it provides.

3. To establish security arrangements to be implemented in the event of an internal accident within the institution.

**Characteristics of the Plan**

1. The plan should be functional, flexible, and easy to implement so that it can be adapted to different situations and circumstances.

2. It should be permanent and periodically updated, providing for a constant availability of resources and of well informed and capable personnel ready to implement the plan.

3. The plan should be coordinated with similar plans of other institutions so that wider coverage, greater efficiency, and a better utilization of available resources may be achieved.

4. It should form part of a regional disaster plan and contribute to the strengthening of civil defense plans.

5. It should be comprehensive, i.e., applicable to disasters within the institution or to external disasters of medium or high severity.
Organization of the Plan: -Management -Legal Aspects -Name of Plan

1. The plan should contain a description of the legal basis whereby the ministry of health of the country concerned is authorized to act in disaster situations, both in public and private institutions.

2. The plan should be given a name that is easily memorized and retained, commemorating an important event in the life of the hospital or in medicine.

Physical Structure
The plan should consider the vulnerability of the physical structure of the hospital in terms of its construction, site, and resistance to different types of disaster. A system of signs should also be instituted. The signs should include:

1. Escape route indicators.
2. Firefighting equipment indicators.
3. A building layout diagram.

Fire detection devices and fire extinguishers should be strategically located (see Annex 3).

Basic Services

Water
With respect to basic services, it is important that the plan indicate the water supply, where the source is located, any alternate source of water, the water distribution and treatment systems, the reserves available, and what water supply possibilities there are under normal conditions and in emergency situations.

Drains and Sewer Outlets
The plan should also show the location of drains, sewage, and solid waste outlets, indicating the systems normally used for treating such wastes, alternate systems for use in an emergency, and arrangements for the management of potentially polluting wastes or septic materials resulting from the management and treatment of infected patients.

In some areas a problem will be the management of radioactive materials such as radioisotopes and other contaminants that could increase the magnitude of the disaster.

Electric Energy
The following should be ascertained: voltage, amperage, and cyclage used in the hospital and the community; alternate sources of electric supply (emergency plants) their capacity, fuel utilized, reserves, degree of autonomy, and service area (if any) for the alternate source; other potential resources available to the hospital for electric energy (fire department, police, electric company, etc.).

The control panels and electric power distribution lines, both internal and external, should be located, and information should be available as to the places where generators can be acquired to supply electricity to the most important areas of the hospital (see Annex 4).
Gas
The gas supply must be kept under control to meet the hospital's requirements. Keeping in mind that fires may be ignited by a spark in disaster situations (including earthquakes), it is essential to know the layout of the pipes and the location of safety valves. Considerable care should also be taken to prevent spills or leaks of inflammable materials whose contact with the gas can cause explosions or fires, adding to the seriousness of the disaster.

Transportation
Transportation within and outside the hospital is a fundamental necessity from a logistical point of view. Arrangements should be agreed upon with the pertinent authorities concerning alternatives to the normal systems of access to the hospital, in order that disaster victims can come in as quickly as possible. Consideration should also be given to building a heliport adjoining the hospital and to the number of vehicles needed to transport casual ties or the wounded, their capacity, and the type of fuel they use. If the hospital's location so warrants, launches or other vessels may also be used.

Intrahospital transportation resources such as stretchers, wheelchairs, treatment carts, etc., should be inventoried. In addition, it is important to know where these items are stored or located so that they may be properly brought into use at the time of a disaster. The circulation areas within the hospital should also be defined.

Communications
The use of the telephones should be restricted to requirements of the service. An updated list of addresses and telephones of all staff involved in the plan and of volunteer personnel should be available at the central switchboard. Communications, both within and outside the hospital, are vitally important. The capacity of the central switchboard, the energy it uses, and the alternative source of energy to be tapped in the event of an outage, as well as the existence of any public address or lighting systems or of personal intercoms, should be known.

It is advisable for every hospital to have a set of VHF or UHF or citizen's band (11 meters) radio equipment with an alternative energy supply (alternating current and battery), since this might be the only means of communication in disaster situations.

Mechanisms for calling hospital personnel into service by means of codes broadcast by commercial radio should also be arranged.

Technical and Administrative Organization
Ideally, the organizational chart in effect during a disaster period should be the hospital's regular one, possibly strengthened and improved for disaster situations. The organizational chart should specify the levels of command in supervision and administration, so that duplication of effort may be avoided and all disaster management efforts and resources may be placed under a unified intrahospital command. In all management as well as administrative aspects, any bureaucratic barriers to the prompt utilization and management of supplies in the storerooms should be lifted and procurement should be expedited through quick, coordinated purchase of the necessary resources.
Administratively, it is recommended that quantities of the necessary drugs, supplies, and medical and surgical items sufficient for at least three months be kept on hand. This inventory will be helpful in the mass management of casualties, and it should be kept in mind that external or international aid will always be late in reaching the patients.

The hospital should be ready for any emergency situation, regardless of its size and magnitude, including, of course, large-scale catastrophes. The organization and operations to be set in motion will depend on the size and magnitude of the disaster.

**Coordinating Director**

1. The plan should be oriented and managed by the director of the institution or his representative: the assistant director or the head of the medical or surgical department. The director or his representative presides over the disaster plan committee and acts as executive coordinator of the plan.

2. Coordination is maintained with other institutions in the health sector, especially the civil defense plan, and internally with the various units and services of the hospital.

**Disaster Plan Committee**

1. The committee operates at the decision-making level and the actions decided upon are executed by the medical staff supported by the institution's logistical and general service units (see organizational chart in Figure 1).

2. Its membership consists of the following scientific and technical officials of the hospital's key services:
   a) the director of the hospital or his representative;
   b) the president of the medical society;
   c) department heads;
   d) the chief of emergency operations;
   e) the director of nursing services;
   f) the chief of personnel;
   g) the maintenance chief;
   h) the administrator;
   i) a staff representative.

**The Committee's Functions**

1. To collaborate in the preparation, organization, and regulation of the plan.
2. To foster coordination of the plan with similar plans in the community and with entities in the public and private sectors.
3. To monitor the implementation of the plan and arrange for frequent drills, including simulation exercises.
4. To assess and update the plan periodically.
5. To be responsible for timely execution, development, and effectiveness of the plan.
Figure 1. Organizational chart of a disaster management plan applicable to any hospital.*

* A slightly modified version of the original table by Alfonso G. Ramirez, "Plan Esculapio-Hospital Militar Central." Bogotá, Colombia, 1968.

**Implementation**

The health team is responsible for putting the plan into practice by means of units, sections or services, to which specified duties are assigned. These units consist of medical and paramedical personnel and workers with proper support from the administrative units. Their field of activity may be within or outside the hospital. The plan should be tested by yearly simulation exercises. The exercises should be held in the following order: first, on a scheduled basis, with
advance notice and with simulated casualties; next, without advance notice, and then simulated casualties. A record of actions and the amount of time used in each should be kept as a basis for rating and evaluating the plan with a view to improving future performance.

**Operating Capacity**

Following a careful study of available personnel, by shift, and of instruments, equipment, and other resources, the peak operating capacity should be determined.

This is expressed in terms of the number of beds assigned to intensive care for acute critical patients who may recover, the number of beds assigned to patients in serious condition, and the facilities for minimal and ambulatory patients.

Within a coordinated regional plan, a well-equipped institution might be given the major responsibility for intensive care, another for intermediate care, and the health centers, ambulatory-care social security centers and certain private clinics could be made responsible for minimal and ambulatory care.

The following procedures help to increase the number of available beds:

1. Subject to criteria established by the medical staff, hospitalization is limited exclusively to patients in critical or serious condition, who are admitted to the intensive care and intermediate care units.

2. Any patient in a condition to be discharged will be authorized to leave the hospital.

3. Available areas will be adapted for use as additional patient-care zones. Hallways should be kept open and unencumbered to facilitate the passage of patients and personnel. The assistant director or administrator will be responsible for the performance of this duty.

4. Conversion of single into two-bed rooms, of two into three-bed rooms, three into four, etc. Bed utilization should be kept flexible, and 15-20 per cent of the total bed capacity should be held in reserve.

Operating capacity is related to the probable number of emergency cases handled per day, number of surgical operations, anesthesias, available instruments and equipment, and, particularly, staff of the institution and other personnel potentially available.
Chapter 6: Implementing the Plan in Hospitals

General objectives of the plan

The main objective of the plan is to provide medical and surgical care to all sick or injured persons who require it as a result of a disaster situation. The operation will consist in directing the hospital's efforts toward the recovery of disaster casualties and patients.

Activating the Plan

Communications Unit

1. All disaster-related incoming telephone calls should be channeled through the hospital's switchboard operator. The operator should obtain the following information:
   a) who is calling;
   b) nature of the disaster;
   c) location of the disaster;
   d) number of cases being sent to the hospital;
   e) estimated hour of arrival;
   f) mode of arrival (example: by ambulance, helicopter, other);
   g) telephone number of the person supplying the telephone information.

2. The operator has no authority to declare that the disaster plan is in operation. The operator should notify the following authorized persons in the order indicated:
   a) chairman of the disaster committee (head of the emergency ward or department);
   b) assistant to the chairman of the disaster committee (assistant to the head of the emergency ward or department);
   c) assistant to the director of the hospital;
   d) senior resident (in point of service) in the emergency ward or department.

A notification that the disaster plan has entered into operation will be given only when it has been so ordered by one of the authorized persons.

After the first contact has been made, the operator will continue to convey all information pertaining to the disaster.

3. Instructions to the operator:
   a) the operator will receive no further calls except those from the emergency extension or those which are replies to calls made in connection with the disaster. The operator should inform callers that no calls will be taken that are not related to the disaster situation;
   b) an operator will be assigned to initiate the disaster notification calls; observing established procedures, the operator will notify the following units or departments:
      • Emergency ward or unit.
      • Hospital security unit.
      • Nursing service or unit.
      • Management.
      • Operating rooms.
• Anesthesiology unit.
• Sterilization unit.
• Clinical laboratory and pathology unit.
• X-ray service or unit.
• Biostatistics unit.
• Social work unit.
• Public relations office.
• Religious services.
• Admissions unit.

c) all operators will resume their work at the switchboard in normal fashion;
d) all calls from press services will be directed to the public relations office;
e) all calls from members of the victims' families will be directed to the information center;
f) all hospital employees' requests for information will be directed to the information center.

4. The communications unit is responsible for contacting only those persons included in the disaster notification list, or those specified by the hospital director. All requests for disaster casualty assistance will be directed to the information center.

Emergency Unit or Ward
After the emergency service or ward has been notified that the disaster plan is in operation, the following steps will be taken:

1. The informant:
   a) will notify the head nurse on duty that the disaster plan is in operation;
   b) will notify all people who are in the emergency room waiting to be attended that they will be examined in turn and in accordance with the severity of each case;
   c) will conduct members of the patients' families to a hospital waiting room.

2. The head nurse on duty:
   a) will place an orange armband on each member of the emergency department staff;
   b) will deliver the instruction sheet to nursing staff and auxiliary personnel;
   c) will assign two nurses to the major treatment area and one to the minor treatment area. These nurses will be in charge of the specific area assigned and will therefore issue the pertinent instructions.

3. The ranking physician on duty:
   a) will assign a physician to each of the triage areas, for major treatment and for minor treatment; these physicians will be in charge of the particular areas assigned and will follow the plan according to the disaster instruction sheet for emergency department staff;
   b) will perform a new triage of casualties who have been treated in the emergency ward and those who are ready to be attended to by a physician in the appropriate major or minor treatment area.

4. The orthopedic technician:
   a) will supervise the stretchermen assigned to the triage area;
   b) will see to it that casualties are moved from ambulances to stretchers in a proper way.
When notification has been given that the disaster plan is no longer in operation, the ranking physician in the emergency ward will complete the report form on the disaster area and send it to the chairman of the committee.

**Hospital Security Unit**
The hospital security service will be notified by the operator that the plan has been put into effect. The following will be done:

The supervisor on duty:
   a) will request the necessary assistance for exercising better control;

   b) should make certain that the following doors are open:
      • Treatment areas.
      • Supply room.
      • Morgue.
      • Information center.
      • Main entrance.

   c) will see to it that all areas are fully identified by name and with signs;

   d) will send a supply of patient identification tags to the triage area;

   e) will get in touch with the office which controls parking places and, in agreement with that office, assign an area for vehicles of members of the family and friends of disaster victims;

   f) will issue appropriate instructions to:
      • Direct all vehicles arriving with disaster victims to the entrance to the emergency ward.
      • Direct all regular emergency patients to the emergency ward entrance.
      • Direct vehicles of members of family and friends of victims to the assigned parking area.
      • Direct vehicles of press personnel to the parking area assigned, and designate the place where reporters will meet in the waiting room of the emergency ward.
      • Coordinate arrangements for a member of the national or military police to provide guard service, and establish radio communication with the hospital security officer.
      • Coordinate the operation of elevators to operating rooms and intensive care units.

   g) when a notification has been issued that the disaster situation is no longer in effect, the security service will be responsible for:
      • Suspending the supply of patient identification tags, securing the doors, and removing the disaster signs from their respective places.
      • Completing the disaster area information form and sending it to the chairman of the disaster committee.
Chairman of the Disaster Committee
1. The chairman of the disaster committee or his assistant will be notified of the disaster by the switchboard operator and will receive the following information:
   a) name and number of the person that called;
   b) nature of the disaster;
   c) location of the disaster;
   d) number of victims that will be sent to the hospital;
   e) approximate time of arrival;
   f) mode of arrival (example: by ambulance, helicopter, other).

2. The chairman of the hospital disaster committee, after putting the plan into effect, will:
   a) instruct the switchboard operator to initiate disaster notifications according to established procedures;
   b) immediately notify the highest local authority where the disaster site is located;
   c) make sure that the shift on duty in the emergency ward is assigned to the initial triage group and to the major and minor treatment areas;
   d) check that a person has been assigned to handle the telephone during the disaster;
   e) make sure that the communications system is operative in all the areas of the disaster zone;
   f) begin compiling a disaster area telephone directory.

3. When the chairman of the emergency committee has determined that the disaster situation no longer exists:
   a) he will notify the communications department and reserve staff to institute procedures for terminating the operation;
   b) the chairman of the committee will be responsible for collecting the information forms from the hospital departments that have participated, for review at the next meeting of the disaster committee.

The Hospital Administrator
1. When the hospital administrator or his deputy has been notified that the disaster plan has gone into effect, he will take the following steps:
   a) assign an assistant to handle the disaster telephone;
   b) assign one or two assistants to the reserve staff area;
   c) report immediately to the disaster information center;
   d) make certain that disaster identification tags have been supplied in the appropriate areas;
   e) see that security personnel are directing and controlling traffic within the hospital areas;
   f) call the office of the medical director and request that the heads of clinical departments be notified that the disaster plan has gone into effect, and make certain that all available medical, paramedical, and administrative personnel report to the reserve staff area;
   g) once the communications system in the disaster information center has been checked, the hospital administrator, acting in consultation with the head of the nursing department, will determine the number of beds available and institute the mobilization of off-duty personnel. The administrator will also coordinate with the nursing department on the movement or release of hospitalized staff, as well as the movement of victims, after consultation with the director of the hospital;
h) the disaster information center will maintain contact with the command post with respect to the number of disaster casualties and the severity of their injuries; the center will also coordinate with the public relations office on the supply of information to members of victims' families and the press;
i) when the administrator has been notified that the disaster is over, he will fill in the form with the pertinent information on the disaster area and send it to the chairman of the disaster committee.

**Triage**

**Triage at the Hospital Entrance**
All patients should enter through a single door. Experience has shown that many people involved in a disaster head for the hospital on their own, independently of the ambulance service. Since it can hardly be assumed that all these persons will have suffered only minor injuries, these patients should also pass through the triage area. Once it has been determined that their injuries are indeed minor, the people in question should be separated as promptly as possible from more seriously injured casualties.

The resuscitation area should be located in a place immediately adjacent to the hospital entrance and the triage area. In most hospitals this would be behind the entrance to the emergency ward, using that ward's major treatment area and possibly the waiting room. Triage should be conducted from the outset by an experienced physician, who may delegate resuscitation procedures and subsequent casualty management to other physicians.

**Triage inside the Hospital**
Triage is a continuous process. In order to be effective it should be applied as soon as possible after the need arises, that is, when a sharp imbalance is found to exist between a large patient demand and the medical resources available for meeting it.

**Triage Area**
Hospital entrance triage is the key to the effective management of a sudden inflow of disaster casualties. The principal objectives are to:

1. Receive the disaster victims.
2. Make a rapid classification of casualties and conduct them to appropriate treatment areas.
3. Provide only such basic treatments as necessary for saving a person's life. This includes serious patients requiring tracheotomies, thoracentesis, venous dissection, hemostasis of bleeding vessels, etc.

The triage officer will have the following responsibilities:

1. Supervising the entire triage area.
2. Classifying the patients into the following categories: minimal, immediate, delayed, and expectant treatment.
3. Instituting decontamination procedures if necessary.
4. Assigning a person to supervise the ambulance team.
5. Assuming full responsibility for the triage area. and serving as head of all personnel assigned to that area.
6. Seeing to it that there are sufficient identification tags, wheel chairs, and stretchers in the triage area.
7. Organizing the personnel assigned to the triage area from the reserve staff.

**Classification of Casualties**
The triage officer will classify the disaster victims according to the following categories:

**Minimal**
Cases assigned to the minimal category are those that can return to their jobs after being treated for minor lesions. The latter include small lacerations, contusions, simple fractures of small bones, second-degree burns on the face and hands, small-bone fractures causing disability, and moderate neuropsychiatric disorders.

**Immediate**
Includes cases of hemorrhages in easily accessible sites, extensive lacerations with quickly correctable respiratory disorders, severe crushing injuries of the extremities, open fractures of large bones, and incomplete amputations.

**Delayed**
This category includes cases in which a delay in treatment after initial emergency care involves very little risk, as for example moderate lacerations without extensive hemorrhaging, closed fractures of long bones, noncritical lesions of the central nervous system, and burns covering 10 to 40 per cent of the body surface.

**Expectant**
Cases considered expectant include those with critical lesions of the central nervous system or respiratory system and multiple severe burns over large areas (third degree and covering 40 per cent or more of body surface). Treatment in these cases will consist of resuscitation maneuvers and emergency medical treatment in appropriate facilities, with adequate equipment and specialized staff.

**Deployment to Treatment Areas**
1. After proper medical evaluation and classification into one of the categories described above, the casualty is taken to the radiology and laboratory departments if clinical conditions so permit. All x-ray requests should include the greatest possible amount of information that will contribute to a better interpretation of the x-ray films.

2. Only the following essential laboratory procedures should be requested:
   a) white blood cell count;
   b) urinalysis;
   c) ureal nitrogen;
   d) glucose;
   e) arterial gases (only for pulmonary involvement);
   f) blood group and Rh factor;
   g) electrolytes (only in patients with burns);
h) hematocrit;
  i) cross tests.

Patients in the immediate treatment category will be conducted initially to the resuscitation room.

Cases in the deferred treatment category will be sent to the minor treatment area.

Cases in the expectant treatment category will be sent initially to the resuscitation room.

Cases in the minimal treatment category will be sent to the minor treatment area. If a plaster cast is required, this will be done in the plaster room in the emergency ward. Dead victims will be identified and then sent to the morgue.

**Resources for the Triage Area**

**Personnel**
The medical and nursing personnel to be assigned to the triage area will depend upon the exact nature of the disaster. For planning purposes, the initial staff might be tentatively the following: a triage officer (surgeon), a general surgeon, an orthopedic surgeon, a dentist, three medical interns, three head nurses, and four auxiliary nurses.

**Material and Equipment**

1. Equipment for pediatric intravenous use 36
2. Tensiometers for children and adults 12
3. Assorted ferrules 2 boxes
4. Tracheal cannulae 36
5. Set of laryngoscopes for infants, children, and adults 1 of each
6. Endotracheal tubes, No. 7 Murphy 36
7. Endotracheal tubes, No. 8 36
8. Nasogastric probes 36
9. Oxygen masks, for adults and children 2 boxes
10. Large scissors for cutting bandages 3
11. Plastic linings 60
12. Phonendoscopes 15

**Sterilization Unit Supplies**

1. Tracheotomy set 6
2. Thoracotomy set 6
3. Venous dissection set 6
4. Set for small sutures 12
5. Bottles for drainage of thorax 10
6. Hand scissors, No. 4 6
7. Syringes (disposable) x 2 cc 60
8. Syringes (disposable) x 10 cc 90
9. Syringes (disposable) x 50 cc 60
Casualty Identification Area

Triage Area
The triage area should be located preferably at the entrance to the emergency ward. Here, the triage officer will determine the severity of the injury to disaster victims and designate the treatment area to which they should be sent.

In the triage area, the nursing staff will attach to each disaster casualty an appropriately color-coded identification tag. Depending on the diagnosis by the triage officer, the following measures will then be taken:

1. Victims determined to be dead will be given a white tag and moved to the morgue.
2. Patients in stable condition who remain so for a period of 30 minutes or more will be sent to the minor treatment area with a yellow tag.
3. All other patients should be sent to the major treatment area with a red tag.

All patients must have a disaster tag and the forms for any laboratory examinations and x-rays ordered. These standard forms of the hospital concerned should be attached to the disaster tag.

Major Treatment Area
The major treatment area should be located in the emergency ward; it is the area designated for treating the most severe cases. When the disaster plan goes into effect, the head physician on duty in the emergency ward will remain on duty assigned to the treatment area until the reserve staff office is able to assign additional medical, paramedical, and administrative personnel.

All treatment of disaster victims in this area will be administered under the supervision of the head physician of the emergency ward. This physician, identified by an orange armband, will be in charge of the major treatment area. All the physicians working in the major treatment area will report to the head of the emergency ward in charge, as will all nursing staff. All staff should wear an orange armband.

Requests for additional personnel should be channeled through the command post located in the center of the major treatment area. Any staff members not wearing the proper armband will be asked to leave that area. Staff whose services are not required for the moment should be instructed to report to the reserve staff office.

Minor Treatment Area
This area should be located near the emergency ward, in the space assigned for treating those patients who are in stable condition and who, judging from the initial diagnosis, will remain in that condition for 30 minutes or more.

When the disaster plan has been put into effect, staff on duty in the emergency ward, also wearing orange armbands, will automatically be assigned to the minor treatment area and remain there until the reserve staff office assigns additional medical, paramedical, and administrative personnel to those areas.
Physicians assigned to the minor treatment area should report to the physician in charge of that area, wearing the appropriate orange armband.

Nurses and other staff assigned to the minor treatment area should also wear orange armbands and should report to the nurse in charge of that area.

Requests for additional staff should be presented to the reserve staff office.

Only authorized staff will be allowed to remain in the area. Persons not wearing the proper armband should leave the area.

Personnel not needed for the moment should be instructed to report to the reserve staff.

**Human Resources**

**Reserve Personnel**
Should be located in one of the reception areas or in a hospital waiting room.

The hospital administrator will assign an assistant administrator to that area.

The director of reserve personnel will:

1. Set up procedures for x-ray examinations and rapid circulation of staff, in coordination with the head of the radiology department.
2. Designate someone to coordinate the assignment of medical, paramedical, and administrative personnel.
3. The first assignments will automatically be given to those arriving first at the reserve personnel office; they will be supplied with armbands and instructions.
4. Kits will be issued (containing coordination instructions, a map of the disaster area, and a color-coded armband), which will allow them to enter the treatment areas.
   - Medical staff: red armband.
   - Nursing staff: blue armband.
   - Administrative staff: green armband.
5. After the first assignments have been made, reserve staff in the three categories noted above will be kept on hand to accommodate command-post requests for additional assignments.
6. If a sufficient number of employees have not reported, the director of the reserve staff may request the nursing department and the clinical department to assign additional personnel. However, if circumstances so require, the hospital administrator may call in off-duty medical and administrative personnel.
Instructions for Staff in Specific Categories
Instruction kits will be issued to all medical staff to be assigned to the triage and treatment areas.

Nursing Staff
Nursing staff will be issued an instruction kit in the triage and treatment areas.

Administrative Staff
Instructions will be issued to administrative staff. The nature of the instructions will depend on the structure and organization of the hospital and the magnitude of the disaster:

1. Social worker assigned to the information center.
2. Biostatistics staff.
3. Public relations staff.
4. Press area staff.
5. Personnel assigned to serve as porters in the triage and treatment areas.
6. Technical x-ray staff assigned to the treatment areas.

Family information center
This is the place where members of the family and friends of disaster victims are to wait for information on the latters' conditions.

The command post will receive a list of casualties and members of their families from the information center.

All discharged patients will be sent home.

Medical and Support Services

Surgical Unit
As soon as the disaster plan has been put into effect, a call concerning that plan will be received at the command post in the operating rooms. The person receiving the call should notify:

1. The chief of operating rooms.
2. The coordinating nurse of operating rooms (recovery room nurse, administrative service nurse, and education nurse).
3. The head nurse of the operating rooms.
4. The head of administrative and support services.

The person in charge of the command post in the operating rooms will announce three times, with a minute's interval: "Code yellow; all unassigned operating room staff report to the recruiting room."
**Casualty Control: Technical Coordinator**
1. All surgical procedures will be carried out in accordance with the normal rules, including those for recovery room service.
2. Patients waiting in the observation rooms to be taken to surgery will return to their respective wards.
3. Patients in recovery rooms will be taken to their respective wards as soon as possible.
4. Surgery patients who have undergone procedures of short duration will be sent home as soon as clinical conditions permit.

**Responsibility: Coordinating Nurses**
1. The recruitment office will assume duties apart from its normal ones.
2. If additional personnel are needed, the coordinating nurse will request the command post to obtain the necessary staff from the reserve pool.
3. If staff is unavailable within the hospital, the reserve pool will send two nuns to the surgery room to help in procedures there and assist the surgeon on duty.
4. The anesthetist assigned to the surgery room will be directly responsible for establishing the procedures to be followed by all anesthetists on duty.
5. The telephone operator will call the head nurse on duty in the surgery rooms and notify her that the disaster plan has gone into effect.
6. The nurse on duty will request that a person from the reserve pool be assigned to her to handle the emergency telephone in the surgery room.

**Medical Services**

**Anesthesia**
This department will be responsible for assigning its staff to the operating room, recovery room, admissions, and respiratory therapy.

**Medicine**
1. Depending on the type of disaster, this department will coordinate or reinforce the efforts of the surgery department in the mass treatment of casualties.
2. Will assign the necessary available staff to the triage, intensive care, and intermediate care areas.

**Pediatrics**
1. Will reinforce the general triage area.
2. As a general rule, the staff of this department will remain on duty in its normal work areas.
3. If circumstances so require, will reinforce other work areas, depending upon the characteristics and type of disaster and age group involved in it.

**Gynecology and Obstetrics**
1. Will coordinate the availability of two delivery rooms properly equipped for maternity cases or other obstetrical emergencies.
2. Will line up the necessary personnel for the delivery rooms and assign appropriate duties to them.
3. Other staff of this unit will collaborate in treating surgical cases as required.
Nursing Unit
1. Will organize admissions and the distribution of its own staff in the different hospital areas.
2. Will organize the administration of primary treatment to patients, administration of parenteral solutions, and placement of identification tags in a visible site (wrist, ankle, etc.).

Pathology
1. Will be responsible for handling cadavers and will coordinate medico-legal activities.
2. Will take charge of delivering cadavers.

Clinical Laboratory and Blood Bank
1. The clinical laboratory will be supplied with all the necessary elements for performing emergency laboratory examinations of disaster victims.
2. Will be responsible for processing all laboratory work immediately after receiving the sample and for sending the results to the treatment areas; will give priority to disaster casualties.
3. The blood bank will keep the situation under review to determine the adequacy of available blood supplies.
4. Will establish blood-supply priorities.
5. Will maintain a sufficient supply of blood type O Rh positive, and type O Rh negative.
6. Will coordinate and classify, on a continuing basis, a group of donors, resorting to employees of the hospital or volunteers.
7. Will coordinate similar arrangements with the national blood bank.
8. Will prepare a daily inventory of blood reserves and forward the corresponding report to the hospital's medical care division.
9. The clinical laboratory will remain alert for further requests until the disaster plan has been declared no longer in effect.

Radiology
1. Will carry all necessary supplies for performing the requisite x-ray examinations of the disaster victims.
2. No other radiological examinations will be done, with the exception of urgent requests, until the disaster plan is no longer in effect.
3. The head of the radiology department will be responsible for organizing its services, distributing its staff, assigning duties, and maintaining an adequate supply of items such as plates, developing material, etc.

Administrative Services

Biostatistics
1. Will provide the necessary coordination in the development of clinical history forms for emergency cases.
2. Will distribute a sufficient number of such forms for urgent clinical examinations.
3. Will arrange to send a statistician to the emergency ward.
4. Will coordinate with other services and issue the necessary instructions on:
   a) typing assignments;
   b) numbering and content of clinical history forms;
   c) patient identification.
Financial Section
1. Will propose and apply control measures which permit, to the extent possible, a substantiation of expenditures incurred during the emergency.
2. Will provide support personnel to other administrative, technical, and auxiliary services, if necessary.

Supply Rooms
1. Will coordinate the necessary arrangements for increasing inventories of items to 20 per cent over the minimum level and increasing the supplies to the various units by the same percentage.
2. Will perform ongoing situation assessments to determine any necessary restrictions and priorities with respect to consumption and supply.

General Services
1. The head of supplies will provide for a rational increase in the supply and procurement of foodstuffs
2. Should submit (as an annex) a transportation plan. The plan should include: availability of vehicles, parking areas, travel distances, routes, fuels, and direction of the traffic and should color-code the areas where patients are to be taken after being tagged.
3. Will expedite the supply of clothing to the emergency area, treatment area, operating; rooms, and other services.
4. Will coordinate staff support with other units not directly involved.

Engineering
1. Should submit (as an annex) a fire emergency plan, including provisions for patient evacuation with support from the nursing department.
2. Will establish shifts for regular inspections of facilities and equipment of basic importance to the hospital's operation.
3. Should present (as an annex) a communications plan for the hospital, including the telephone and paging systems and elevators.

Pharmacy
1. Will coordinate the necessary arrangements for increasing the minimum inventories of products by 20 per cent and supplies to the various services by the same proportion.
2. Will assign supply priorities to emergency and treatment areas and operating rooms, especially with respect to supplies of the following items: plaster, elastic bandages, analgesics, electrolytic solutions, antibiotics, sutures, anesthetics, oxygen, plasma, x-ray plates, etc.

Procurement Sectio
1. In direct coordination with the heads of supply rooms and pharmacy, will take a continuous inventory of drugs and supplies with a view to expediting procurement when necessary.
2. Will coordinate with the normal sources the extension of appropriate priority for supplies required by the hospital.
3. Will coordinate with other hospitals and medical centers on the procurement of goods which are hard to obtain through normal channels.
Capacity and general means of attaining the objectives

In order to make available a larger number of beds, the following measures will be taken:
1. The number of hospitalizations will be restricted except in the case of serious and critical patients.
2. Hospitalized patients in good clinical condition will be discharged.
3. When the magnitude of the disaster so requires, the assistant administrative director, acting in coordination with the head of the general services section, will proceed to adapt those areas available for increasing the number of beds. This will be done by the following means:
   a) utilization of the solaria on the various floors. Individual rooms will be converted into two-bed rooms, two-bed rooms into three, and so on;
   b) beds will be placed in other areas, such as the gymnasium, library, etc.

Identification of hospital staff
1. All hospital staff should be provided with a hospital identification card, which the bearer may be required to show in order to enter or leave the hospital.
2. The personnel office will be responsible for issuing such cards to all hospital personnel.

Transportation of hospital staff
While the plan is in operation, off-duty staff will be transported to work in hospital vehicles with the assistance of the transportation pool of other institutions.

Arrival of casualties by air
1. The heliport will be the reception area for cases arriving by air.
2. Nurses and physicians assigned to this area will have the essential supplies and equipment available for initiating the stabilization of patients arriving by helicopter prior to their removal to the treatment areas.
3. The physicians and nurses in charge of staffing the heliport area will also be responsible for performing triage in such cases, following procedures similar to those established by the triage officer.
4. All supplies and equipment needed for triage and the stabilization of patients arriving by helicopter will be taken to the reception area by hospital security staff.
5. Communications between the heliport and the command post will be maintained by means of walkie-talkies carried by hospital security staff; one staff member will be stationed at the heliport and another at the command post.

Ambulance fleet
The ambulances will carry the following equipment:
1. Oxygen, oxygen mask, and manometer.
2. Stretchers and blankets.
4. Suction equipment.
5. Supplies for immobilizing fractures.
6. Venoclysis equipment.
7. Drugs for emergency use.
8. Minimal equipment for resuscitation maneuvers.

Each ambulance should be staffed by at least a physician, a nurse, a stretcher-bearer, and a driver. The medical and paramedical personnel should be experienced in procedures for the management of patients in intensive care units.

**Press area**

The area assigned to the press should be located in the emergency ward waiting room. The purpose of this section is to provide any type of information to the press about the disaster victims.

**Director of the public relations office**

The director of the hospital's public relations office has the following responsibilities:

1. Seeing to it that the press area is under no circumstances set up within a treatment area.
2. Issuing press releases about the number and condition of the victims. Their names should be supplied only after the next-of-kin has been notified by the social worker or employee assigned to this duty.
3. At the outset of the disaster, bulletins will be issued approximately 15 minutes apart; depending on the duration of the disaster, they will be issued thereafter at longer intervals or only when necessary.
4. Maintaining a list of all calls received from the press.
5. If an official statement is necessary, it should be made by the hospital administrator.
6. The public relations officer should make certain that no patient is identifiable in any photograph issued.

**Morgue**

The reserve staff will assign the necessary nursing personnel to the morgue to receive cadavers and complete the identification tag with the data obtained from the victim's personal effects. Each body will be covered with a sheet and two copies of the victim's identification card will then be sent to the command post.

**Workday**

For purposes of implementing the plan, a 12-hour workday will be established from the moment it goes into effect. There will be two shifts: one from 7:00 a.m. to 7:00 p.m., and the other from 7:00 p.m. to 7:00 a.m. of the following day.

It will be the responsibility of department heads to see that unit chiefs organize these shifts and send a copy of the staffing sheets to the hospital management.
**Women's volunteer corps**
The head of the corps will prepare a list of available personnel and of the shifts that they can serve in each of the hospital's units.

The director of the corps will be responsible for the work of her staff, who, in addition to their regular duties, will work in close cooperation with the personnel section and with the biostatistics, social work, and public relations units.

The special duties of the women's volunteer corps are as follows:

1. Transportation of patients within the hospital, in close collaboration with the nursing staff.
2. Transportation of patients outside the hospital, accompanying the sick in ambulances when necessary, or in private vehicles if the patients' circumstances permit.

In addition, they will assist in public information, telephone contacts, dietetics, secretarial work, storerooms, the clinical laboratory, and the sterilization unit. They will also assist in the files and in solving wardrobe problems.

The director of the volunteer corps, receiving instructions from the hospital director, will be responsible for establishing uniform criteria on recreational activities for adult and minor patients.

**General coordination instructions**
The lines of command and authority of the hospital's general organization will be maintained. The plan will initially be put into effect for a period of 24 hours. If the emergency continues it should remain in effect for a longer period. This being the case, the head of the administrative unit should develop plans for maintaining a 72-hour supply of drugs, surgical material, food, and other items currently used in nursing.

The staff will be advised that the plan is in effect by means of an announcement transmitted through the public address system or other available means.

The telephone switchboard will have an updated list of all hospital personnel, with addresses and telephones.

Valuables and other personal effects should be placed in stamped and sealed envelopes and forwarded to the main cashier in the financial section. The nurse assigned to "emergency unit valuables" will be in charge of collecting such objects.

**Activities of other divisions, departments, or units**
The head of the medical education division, acting in collaboration with the chief of residents and interns, and taking into account the magnitude of the emergency, will distribute all residents and interns in the best possible way with the aim of covering the immediate requirements in the surgical and medical units.

For security reasons, and in order to exercise better control, certain very important areas of the hospital will be declared off limits and monitored by their own personnel and security staff.
These areas contain: boilers, the emergency power plant, the oxygen plant, the fuel tank, and water tanks.

**Coordinator's instructions to all units and departments**

1. All normal functions will cease during a disaster situation or drill.
2. The elevators should not be used in the event of a fire or electrical emergency.
3. Department and service heads will be responsible for instructing and preparing their staff for proper performance in a disaster situation or during a drill.
4. In the event that a disaster situation or drill takes place after 5:00 p.m. or during a weekend or holiday, each department and service should have an updated plan for establishing a communications system.

**Final considerations**

The administration, development, and implementation of the various activities called for in the plan should be carried out carefully and in an atmosphere of complete order and understanding. Everything possible should be done to avoid the appearance of haste and the formation of groups that can create confusion and hamper the activities and functions mentioned above.

**Termination of the disaster plan**

1. Only one of the authorized persons may announce that the plan for the disaster situation is no longer in effect. The communications department is responsible for disseminating this announcement.
2. When the operator has been notified that the disaster plan is no longer in effect, the following measures will be taken:

   a) The operator will communicate with all units or departments included in the disaster notification list to inform them that the disaster situation plan is no longer in effect.
   b) A representative of the communications department will complete the disaster area report form and send it to the chairman of the disaster committee.

Members of the Chilean Emergency Medical Team evaluate their plan and inspect emergency supplies at regular intervals.
Chapter 7: Updating and Evaluating the Hospital Disaster Management Plan

**Updating**
All hospital disaster plans should be updated frequently to reflect changes in staff, resources, technicians, etc., which have taken place since the plan was prepared. Updating should be quantitative as well as qualitative and should cover both human and material resources. If the updating is made after an actual disaster, disaster simulation exercise, or other type of test, it should reflect a correction of any failings detected. The interval between one updating and the next will vary according to conditions in each institution, but every plan should be updated at least once a year and whenever possible the updating should be preceded by an evaluation.

**Evaluation**
Periodic evaluations of plans are made in order to keep them from becoming static documents. It is not advisable to rely on those responsible for implementing a plan to remember all the measures specified in the plan. Every participant should be familiar with those measures and with all activities provided in the plan in order to ensure that the assigned missions or tasks - which are performed under adverse conditions - are successfully carried out.

In an organization, an evaluation is a way of making certain that everything is being done in accordance with the timetable or plan adopted. Its purpose is to pinpoint any failings or errors so that they may be corrected and their repetition avoided. An evaluation applies to everything: to people, resources (including reserve staff), activities, and methods.

Systematic evaluations afford a means of being certain that the plan exists, is being applied and is kept up to date, that the roster of personnel and list of material resources are complete, and that the activities contemplated in the plan are being carried out. The evaluation also provides an opportunity to check the condition of equipment, the turnover of reserve drugs, etc.

An effective evaluation is carried out promptly and is followed by correcting any errors or shortcomings detected. Conversely, if the findings of an evaluation are drawn too late to be used, the evaluation will have been useless.

However well a hospital disaster management plan is prepared, and however correct its calculations and considerations are, all the work is doomed to fail in the absence of the necessary evaluations to ensure that it can be successfully applied. An evaluation therefore requires planning; the clearer, more complete, precise, and coordinated a plan is, the more complete the evaluation should be.

Evaluation is a duty of every responsible staff member, regardless of rank. It is carried out at all levels and functions and should be defined and clearly adapted to the characteristics of the organization, specifically to the activities of the unit, department, or section being evaluated.

An evaluation covers every element of the institution: labor force, basic facilities, materials, operational resources, activities, drugs, instruments, in short, all the necessary aspects, whether or not contemplated in the plan, including reserves. It is a means of noting and highlighting any
errors or deficiencies, which should be rectified and corrected, with the necessary action taken to avoid their being repeated.

The real purpose of an evaluation is to measure efficiency and detect deficiencies so as to correct them at all levels. It should be clearly defined and be carried out under the personal responsibility of the relevant officials in the chain of command. Evaluation validates and complements planning.

Indeed, evaluation is the basis for short-term planning. It is vitally important to bear in mind that in order to check that everything is proceeding in accordance with established plans, orders, and principles, it must be verified that these elements have not only been understood but also intellectually and emotionally accepted by those in charge of executing the plan.

Evaluation Methods
There are several evaluation methods, simulation exercises, and drills: scheduled, unannounced, and in-service, to mention several.

The best evaluation of a hospital disaster plan is one carried out after an actual disaster, since it is then that all the factors involved come into play under conditions of real pressure.

Only then can events or situations occur which have not been foreseen or detected in the plan itself or in any type of evaluation of the plan.

While we realize that it is neither a good idea nor a welcome one to have people looking for errors or defects in a plan in the midst of a disaster situation, we must recognize that even in the worst of times a manager has to follow the basic principles of administration, including control, which is an ongoing activity.

In this type of situation, the actors are real and there are no observers or evaluators as in drills, and it is these actors who will later point out the failings and errors. The implementation of the plan will depend on their efficiency and knowledge, and they will have to be their own evaluators, observing when something isn’t working or an error is made and pointing it out after the emergency stage or, even better, right after the problem is detected, so it will not be forgotten in the course of time. It is important, also, to indicate how any difficulties encountered were solved.

Once normalcy is restored, the procedure applied is the same as that at the end of a drill: the results of the activities carried out during the emergency period are evaluated, errors or deficiencies are pointed out and corrected, and the hospital's plan is revised if necessary.

Hospitals acting without prior planning in a disaster situation have frequently concluded that a plan for dealing with future disasters must be prepared. This is a good conclusion and an excellent decision, but it should be kept in mind that disasters do not occur year after year in the same place and that much time may elapse between one disaster and the next. Accordingly, since resources, methods, and techniques are constantly changing, it is necessary to evaluate and update established plans so that action in disaster situations will be more efficient and will result in saving lives and preventing irreparable harm to health.
Drills
There are three types of drills: scheduled, unannounced, and in-service. In scheduled drills all the participants know that a drill will be held, are aware of the procedures, and must engage in prior rehearsals. Conversely, in unannounced drills the participants do not know that a drill will be held and must therefore be notified at the time it begins. In order to carry out a drill of this type, all participants must have full advance knowledge of their missions and functions. Such drills must not be carried out without prior scheduled drills having taken place.

In-service Drills
An in-service drill is held only when the entire system has engaged in a number of scheduled and/or unannounced drills and the staff is well-trained. The purpose is to simulate use of the hospital as a mass-casualty treatment center following a disaster. It is in such drills that the performance of an institution in a disaster situation can really be evaluated.

Principal Objectives of Drills
1. To train the staff of the hospital (medical, nursing, technical, etc.)
2. To detect errors or flaws in the plans.
3. To minimize the time required to put the hospital on an emergency footing.

Drills must be well organized and coordinated, so that each participant will perform his role and know the work he has to do. Each participant should have the answers to the following questions: What has to be done? How should it be done? With what should it be done? When should it be done?

If each participant can answer these questions correctly, an important step will have been taken.

In scheduled drills, there should be various training sessions as follows:
1. A session to explain what each participant has to do.
2. Separate, partial rehearsals for each section or group of participants (including the simulators).
3. A comprehensive rehearsal by the entire hospital system. It is important to be sure that all staff included in the plan participates, or at least that the heads of principal units and representatives of all the sections take part.

People acting as casualties in a drill should also be well trained. Preferably, they should be drawn from the community itself which will be assisted. If the type of disaster to which the community is prone is known beforehand, it is important, first of all, that all the staff be familiar with the type of damage that such a disaster may cause and, second, that the activities be directed to that type of damage. This should be based on a forecast to be provided by the relevant specialists.

If, in the event of a disaster, the hospital is to be relocated, the new location should be chosen as the site for the drill. The important thing is that the drill be carried out according to plan. A drill should never be scheduled if there is not a written and detailed plan available beforehand.
In planning the drill it should be borne in mind that its success will not only depend on the organizers but also on the participants' advance knowledge, responsibility, discipline, and preparation.

In addition to acting the part of victims of the supposed condition, the simulators should be appropriately made up. The makeup should be consistent with the assumed type of lesion so that the team providing first aid and classifying the casualties will be able to identify any problem correctly. This would require engaging the services of professional makeup artists from the movies or television. Instructions or training manuals should be prepared and handed to each participant. The manuals should include instructions on:

- general information, including information on the hypothetical disaster;
- organization and conduct of the drill;
- activities to be carried out;
- calendar or timetable;
- specific procedures for each section or working group (evaluation group, first aid and evacuation group, emergency services group, etc.).

It should also be taken into account that a hospital is not really able to handle a disaster situation by itself; consequently, in the case of a drill, arrangements should be made for cooperation or coordination with other agencies or institutions (civil defense, Red Cross, Armed Forces, firemen, ministry of the interior, etc.).

Other auxiliary documents to be prepared include:
- hospital plans and disaster area maps;
- communication routes, with an indication of itineraries to be followed according to priorities;
- existing population, by age group;
- most common diseases, etc.

**Evaluation of the Drill**

In planning and carrying out a drill, provision should be made for an evaluation group composed of persons who are knowledgeable and experienced in the type of activity to be conducted and who are not participants in the drill. The purpose of this is to obtain evaluators who can readily detect any errors committed or flaws in the system.

The evaluation makes it possible to arrive at a critical assessment of the performance and results of the drill and should be aimed at analyzing:
- whether the organizational methods provided in the plan were carried out in a timely and proper manner;
- whether medical care in the disaster area was adequate and efficient;
- whether the evacuation to the hospital proceeded according to plan;
- whether intrahospital care was adequate, timely, and speedy.

If photographic, movie, television, and other equipment is available, it should be used primarily when errors have been committed, for the purpose of explaining and illustrating the errors to participants.
After the exercise is concluded, the participants will be called to a meeting at which performance will be summarized and any errors pointed out.

**Simulation**

The term simulation refers to the use and development of a model. A model is a theoretical representation of a reality. A disaster simulation is an exercise in which a model is developed representing an actual situation: an earthquake, hurricane, or other type of disaster, along with the relevant decisions.

Principal features of simulation:
1. Simulation is a technique oriented toward active participation by instructor and participants. It also represents an approach or point of entry for providing training in a given situation.
2. It is generally a problem situation and therefore useful in the interdisciplinary development of the teaching-learning process.
3. It is essentially a dynamic technique which is based on changing situations and requires flexibility in thought and response, which must be adapted to whatever circumstances exist at a given time.

During a simulation exercise, the participants are expected to make decisions in situations that change whenever new information is received.

**Some Objectives of a Simulation Exercise**
1. Present a simplified abstraction of the essential elements of a situation;
2. Make explicit the essential relations and fundamental interactions in a situation;
3. Move the time variable ahead at an accelerated speed so that the implications arising from action taken in a dynamic situation may be clearly experienced;
4. Place the participant in a pressure situation, so that he feels the direct impact of decision-making;
5. Offer an opportunity to participate in the teaching-learning process based on a self-teaching approach.

There is no question but that one of the most significant advantages of simulation is its ability to speed up the passage of time. This is a fundamental characteristic that will enable participants to make decisions on situations that normally would develop over a longer period of time.

In short, a simulation exercise requires that the participants become "actors in a play," assuming roles which reflect a real situation or experience, and making decisions according to their respective roles.

In the particular case of simulations in hospitals that have to prepare for action in the event of disasters, the exercise should pursue the following goals:

1. Acquaint the participants with the decision-making process in situations of uncertainty and in the presence of confused and inaccurate information.
2. Encourage participants to make a critical analysis of information received concerning the disaster.
3. Provide an opportunity to make decisions on most of the problems associated with the emergency.
4. Develop the decision-making process with respect to:
   
a) administrative management of mass casualties;
b) available human and material resources;
c) disaster-action capability;
d) expansion of hospital capabilities (intra- and/or extra-hospital capability);
e) preparedness for disaster situations.

5. Help the participant experience the pressure of having to make important decisions with low levels of information or with information from unreliable sources.
6. Interpret the existing relationship between the hospital and the other factors in a disaster situation.
7. Encourage the analysis of costs and of practical problems of implementation in the special situation of resource shortages following a state of disaster.
8. Analyze the problems which arise in the management of volunteers.
9. Indicate the importance of coordinated and cooperative decision-making during a disaster.
10. Recognize the need for advance planning and preparation for disaster situations.

**Method**
The simulation method is based on the participants' own experience. Each participant will have a clearly defined role that should be assigned to him at the beginning of the exercise in accordance with a pre-established program.

Participants should be prepared to work an unusual number of hours.

There will be a coordinator with the following functions:
   a) coordinate action;
   b) assign roles;
   c) control and change the time and pace of action;
   d) supply information;
   e) intervene to introduce changes in the group's action;
   f) maintain a supply of reference materials or data that participants may request and which are needed for decision-making;
   g) observe and analyze everything that happens during the exercise;
   h) present a final report.

The group may also have an observer to record the management of situations, the decisions taken, and the conclusions of the group with respect to each important aspect. The observer will assist the coordinator in conducting the exercise, in the analysis and subsequent discussion, and in preparing the final report.

Upon completion of the simulation exercise there will be a meeting to develop conclusions at which experiences and the errors committed will be discussed along with their consequences and ways of correcting them. A final report on the salient aspects will then be prepared and sent to the appropriate hierarchical level.
**Performance Audits**

Performance audits are a means of supplying information and advice applicable at the levels of execution of the various tasks carried out by an organization. It is a responsibility of every manager. The auditor is seen at times as an inspector whose duties are to monitor for the purpose of punishing; however, this does not mean that at a given moment the results of an audit may not lead to punitive action. What matters most is that the auditor put his wide experience and ability at the service of the institution to enable the work to be done more effectively.

Consequently, the purpose of performance auditing is to determine and judge the effectiveness of the hospital's disaster management plans and then to assign a rating or evaluation and, at the same time, suggest any changes considered necessary for a more effective achievement of the plan's objectives.

Carrying out performance appraisals or audits, an inescapable duty of every manager, is far from a simple matter. A satisfactory audit depends on a wide variety of factors, all of which are essential.

Audits do not necessarily entail the exercise of formal authority; they do, however, require that the person in charge have the necessary basic knowledge and experience of the activity being audited and that this be acknowledged by others. A forceful personality and a sound reputation are additional requirements. If formal authority is added to all of this, the audit will surely achieve its aims.

The auditor may or may not be heeded; the person being audited may either accept or reject the auditor's advice but in the latter event he should assume the entire responsibility for his subsequent conduct and its consequences.

The deficiencies detected and any suggestions should be put in writing immediately after the audit is completed. Copies of these written reports should be delivered to the auditees and their immediate supervisors so that the entire action will be placed on record and the supervisors may take the relevant decisions.

**Phases of an Audit**

An audit should be carried out in an orderly fashion and in such a way that the desired results will be attained. For this to occur the following stages must be completed:

- a) planning the audit;
- b) implementing the audit;
- c) evaluating the subject of the audit;
- d) final decision.

**Planning the Audit**

Performance audits should always be scheduled, though the persons to be audited may or may not be aware of the fact.
The designated auditor should have advance knowledge of the hospital's plan, the responsibilities of its staff, and the priorities to be observed. Once he has acquainted himself with these aspects he will develop a calendar or survey form to use as a guide in implementing the audit. This, however, is not to say that as the work progresses changes may not be made to adjust to circumstances encountered. The calendar and survey form may or may not be delivered in advance to those being audited, depending upon whether or not the audit is to be announced.

On occasion, when there is a good survey form, it may be delivered to the prospective auditees to obtain their written replies, with a view to subsequent verification of the answers to some of the questions.

**Implementing the Audit**
The activities involved in implementing the performance audit are interviews, observations, demonstrations, etc. They begin with an exchange of ideas between auditor and auditee for the purpose of establishing a relationship of mutual trust.

There may be an exchange of questions and answers. The auditor's advice should be tendered courteously, with no sarcasm or show of condescension but also with no suggestion of indecision, pity, or paternalism. It is important to point out the fault when something is going wrong, but not to criticize except constructively.

Courteous treatment of the personnel being audited is helpful in a successful audit. The perception of a desire to help, guide, and teach, rather than punish, scold, and threaten is very important.

**Evaluation of the Activity being Audited**
Immediately after the audit has been conducted, the findings should be rated. This rating may be qualitative or quantitative; what matters most is that the salient aspects in each situation be reflected in the rating and really accepted by the auditees. As part of the evaluation, those evaluated must be given a period of time in which to overcome their deficiencies or catch up with implementation timetables, all of which should be subsequently checked.

**Conclusions**
Once the various factors that led to repeated deficiencies have been evaluated, the causes of each problem should be clearly and precisely identified and the remedy for each situation indicated.

The report should be explanatory and consistent with the discussions with those who were being audited.

The report is submitted to the immediate supervisors so that the next-higher level of authority may take the relevant decisions, with a copy delivered to those whose activities were audited.
Annexes

Annex 1: Disaster behavior: Assumptions and realities

1 E. L. Quarantelli, Director, Disaster Research Center, Ohio State University, Columbus, Ohio

personnel and resources might be deployed for security measures rather than other response actions.

The most important thing about disaster planning is not what is said, but what is assumed. Particularly crucial are the assumptions that are made about human and group behavior in disasters. If the assumptions are valid, then what is said about the planning process has the possibility of being relevant and worthwhile. If the assumptions are invalid, the planning advocated cannot be anything but poor.

Unfortunately, studies by social scientists in recent years have shown that much disaster planning, as well as training programs, are based on incorrect assumptions about such behavior. Especially distressing is the mistaken view that actual or potential disaster victims do not react too well in the face of danger. This is simply not true: reality is different from the assumption.

Assumptions

Three assumptions are commonly made. There is the view that human beings will "panic" or break down under extreme stress. It is also widely believed that antisocial behavior - especially of a criminal nature - will surface. Finally, it is thought that disaster victims will be passive and absolutely dependent on organizations for help.

Were this to be true, it would have important implications for disaster planning and response measures. There could, for example, be genuine concern about ordering an evacuation because of the fear of panic. Also,

As a whole, people do not panic. Actual instances, of hysterical breakdowns are extremely rare. In fact, instead of flight away from danger sites it is much more likely that there will be convergence on the impacted areas. Instead of aimless running around, actual or potential disaster victims move to what they consider safe locations and attempt to do what they think has to be done in an emergency. Neither do disaster victims develop psychoses or severe mental illness. Disaster victims are usually quite frightened, but that does not mean that they will act impulsively, selfishly, or crazily. The usual response is an attempt to consciously assess the nature of the situation and to consider the available courses of action.

Antisocial behavior

Many inexperienced officials and journalists apparently see disasters as opportunities for antisocial behavior to surface. It is speculated that deviant behavior will emerge, with widespread looting and other forms of criminal behavior. Essentially, it is the assumption that the latent evil in humans will be manifest to the extreme at times of disasters.

This view has also been shown to be incorrect. What generally emerges is prosocial behavior. Many stories of looting will circulate, but actual instances will be rare and if they occur they will often be done by outsiders rather than the impacted population. Disorderly crowd behavior seldom occurs. Crime rates often drop and exploitative behavior is relatively infrequent. Usually, far more goods will be shared and freely given away than could conceivably be looted.
Dependency
There is a tendency to assume that disaster victims are left dazed, shocked, and unable to cope with extreme physical and psychological stress. It is supposed that victims are so disoriented and demoralized that they will need outsiders to do the most elementary tasks for them such as being fed, housed and clothed. Thus, it is expected that an impacted population will passively wait until organized help arrives from the outside.

This is not borne out by studies either. Victims are not immobilized by even the most catastrophic of events. They are neither devoid of initiative, nor do they passively wait for others to take care of them and their needs.

What emerges instead is considerable individual and group initiative. Usually, before full impact is over, search and rescue efforts are initiated by neighbors, and the injured are brought to where medical care can be obtained. Shelter is actively sought and offered by kin and friends, and single home rebuilding efforts are started early. In just about all disasters, cooperative informal initiative and assistance will be the predominant behavior. Formal helping organizations will be sought and depended on only as a last resort or under unusual circumstances.

Conclusions
We do not want to leave a picture that individuals by themselves or together with a few friends and neighbors can handle all emergency related problems. There are things that individuals can or should not do for themselves. Neighbors might find victims in search and rescue efforts but they cannot provide medical treatment. Similarly, heavy debris clearance, rebuilding of bridges, restoration of electric power, testing of water for contaminants, etc., are not tasks that private citizens or small groups of neighbors can perform very well. Furthermore, such matters as issuance of warnings, designing of priorities for emergency actions, integrating the convergence of outside relief help, restocking medical supplies, or making decisions about recovery measures, etc., of necessity have to be organizational responsibilities.

Is the picture we have depicted of human behavior a universal and absolute one? It is by far the typical and most frequent one which will be encountered but exceptions can occasionally be found. A disaster or a threat will not bring order, except very temporarily, to a society wracked by civil strife. If a community is plagued by widespread stealing on an everyday basis, such behavior will not substantially disappear except very momentarily at the time of the emergency. If a population is living on a bare subsistence basis daily, there can be only fleeting sharing of goods with victims when a disaster strikes. Past situations still continue to be the best predictor of future behavior. However, our point is that disasters in themselves do not markedly increase social pathology, criminal behavior, or conflict over their normal rates of occurrence.

If, instead of panic, relatively controlled behavior, order, and a fair amount of personal and family initiative are the norm, different kinds of disaster planning and response measures are indicated. Unless they have clear evidence to the contrary, disaster planners and emergency personnel should assume that they will be faced with the more positive rather than the negative features of human behavior. They, as well as those responsible for disaster training, must be careful to avoid the mythologies and stereotypes which prevail. There is in fact the danger that if the incorrect assumption is made and acted upon, such as the supposed passive dependency of victims, a self fulfilling prophecy will be the result. In the main, human beings rise to the challenge of disasters. It is in the helping organizations where most of the response problems occur. Such groups and agencies should not compound their problems by making the wrong assumptions about the victims with which they will deal. It is our hope that the remarks made here will contribute to a realistic perspective on disaster behavior.
Annex 2: Medical care survey form

The purpose of this survey is to solicit information on health care centers at the national level and the availability of their human and material resources, in order to organize plans and programs for medical care in the event of public disasters. It is important to obtain detailed information in order to create a regionally-organized file of resources that makes possible the quick deployment of those resources to meet requirements in the country's various regions.

Medical Care Survey Form

1. General Data
   1.1 Name of medical care center

   1.2 Address

   1.3 Telephone(s)

   1.4 If the center has radio equipment:
      i) Call letters
      ii) Operating frequency

   1.5 Area served (geographic)

   1.6 Comments:
      i) Type of center:
         Hospital
         Health center
         Dispensary
         Health unit
         Clinic
         Service module

2. Environmental Structures

2.1 Hospital capacity - Indicate the total available number of:
   i) Beds
   ii) Intensive therapy beds
   iii) Infectious-case beds
   iv) Beds for burn victims:
   v) Intermediate therapy beds
   vi) Specialty beds (specify):
       Specialty
       Number

   vii) Operating rooms:
   viii) Morgue:
   ix) Others (specify)
       Name
       Number
Describe the characteristics of convertible areas and spaces that might be utilized to increase hospital capacity in the event of an emergency or disaster. Specify the size (in square meters) of each area or space, the services available in it (water, light, telephone, others), and provide any other information that may be useful for assessing the suitability of each area for medical care in the event of an emergency or disaster.

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2.2 Autonomy

The following information will make it possible to determine the length of time over which the facilities can continue to be operated autonomously in the event of a disruption of basic services or a supply crisis.

i) **Plant** - List of buildings making up the hospital's plant *(including maintenance areas)*

<table>
<thead>
<tr>
<th>Building (Name/Identification No.)</th>
<th>Number of floors</th>
<th>Number of entrances/ exits</th>
<th>Year of construction</th>
<th>Type of construction</th>
<th>Number of beds in the building</th>
<th>Medical services in the building</th>
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**Others (attach additional sheet(s))**

Does the hospital have extensive and unobstructed grounds nearby where field hospitals and/or emergency services can be located? Include parking areas, green areas, and others. For each area include dimensions in meters.

1. Area ___________ Location ___________ Surface area __________ m²
2. Area ___________ Location ___________ Surface area __________ m²
3. Area ___________ Location ___________ Surface area __________ m²
4. Area ___________ Location ___________ Surface area __________ m²

ii) **Electricity**

If the facility has a power generator, indicate:

a. Type of plant: __________________________________________________________

b. Capacity (kw): _______________________________________________________

c. Fuel used: __________________________________________________________

d. Fuel storage capacity: ________________________________________________

e. Autonomy _________________________ hours.

f. Indicate whether the feeding of the plants by the electric company is by means of an independent circuit or a circuit serving various users.

   Independent [ ]  Various users [ ]

g. Indicate the supply voltage (number of volts): _________________________

h. Identify the power substation supplying the hospital and give its location: __________________
i. Indicate the electric company’s three substations which are closest to the hospital and may be usable as sources of supply by direct special line in the event of an emergency.

1) Substation __________ Address______________
2) Substation __________ Address______________
3) Substation __________ Address______________

j. Average daily use of electricity in 24 hours _________ kv/24.

k. Is the hospital’s physical structure such that certain areas can be supplied with electricity independently?
   Yes ☐ No ☐

l. If yes, explain whether the normal power system has special feeder circuits for:

   Emergency units         Yes ☐ No ☐
   Operating rooms          Yes ☐ No ☐
   Intensive care units     Yes ☐ No ☐
   Intermediate care units Yes ☐ No ☐
   Laboratory              Yes ☐ No ☐
   Sterilization center    Yes ☐ No ☐
   X-rays                  Yes ☐ No ☐
   Elevators               Yes ☐ No ☐
   Kitchen (cold storage rooms) Yes ☐ No ☐
   Water pumping systems   Yes ☐ No ☐

m. Is there any emergency lighting system (batteries or stationary lights, etc.)?

1) Area _______________ Type of lighting _______________ No. ________
2) Area _______________ Type of lighting _______________ No. ________
3) Area _______________ Type of lighting _______________ No. ________
4) Area _______________ Type of lighting _______________ No. ________
5) Area _______________ Type of lighting _______________ No. ________
iii) Water supply

a. Source: _____________________________
b. Capacity of tanks: ________ liters.
c. ________ cubic meters.
d. Reserves estimated for ________ hours.
e. Hospital's monthly water use: ____________ m3

f. Diameter of supply pipe(s):
   1) ________________________________
   2) ________________________________
   3) ________________________________

g. Does the hospital have a water pumping system?
   Yes [ ] No [ ]

h. If yes, indicate:
   Number of pumps ____________
   Capacity of each ____________

i. What would be the best way of supplying water to the hospital in an emergency?
   ________________________________________________________________

iv) Sewage

   Type of disposal: ______________________

v) Food

   a. Freezers and refrigerators
      Indicate the characteristics and capacity (cubic feet or cubic meters) of each:
      ________________________________________________________________

   b. Reserve supply of food estimated to last:
      Nonperishable food: ________ days.
      Perishable food: ____________ days.

vi) Drugs

   Reserve supply of drugs estimated to last: ____________ days.
3. Technical resources

Indicate the characteristics, quantity, and capacity of available technical resources.

3.1 Surgical instruments

Indicate specialty, characteristics, and quantity of available surgical instruments:

i) General surgery boxes________

ii) Trauma boxes____________

iii) Neurosurgery boxes________

iv) Laparotomy boxes________

v) Thoracotomy boxes________

vi) Boxes for____________________

vii) Boxes for____________________

viii) Boxes for____________________

ix) Boxes for____________________

x) Boxes for____________________

3.2 Sterilization systems

Indicate with respect to each system:

i) Type: ______________________

ii) Capacity: ___________________  a. ______________________

ii) Energy sources: ______________

Type: ______________________

Capacity: _____________________

Energy sources: ________________  b. ______________________

Type: ______________________

Capacity: _____________________

iv) Total number of sterilization systems: ____________________________

v) Total capacity: __________________

3.3 X-ray equipment

Indicate with respect to each set of x-ray equipment:

☐ Stationary  Type:________________________________

☐ Portable  Characteristics:___________________________

☐ Stationary  Type:________________________________

☐ Portable  Characteristics:___________________________
Stationary  Type: _______________________________

Portable  Characteristics: ________________________

Total number of sets of x-ray equipment:  Stationary: _________________
                                      Portable: _________________

3.4 Other equipment

Indicate with respect to any other available equipment:

   Name: _____________________________
   Type: _____________________________
   Characteristics: _______________________________

3.5 Blood bank

If the facility has a blood bank, indicate:
   i) Capacity: ____________ liters _______________
   ii) Average reserve: ____________ liters _______________
   iii) Number of associated donors: ____________________

4. Human resources

4.1 Physicians

   Specialty: _____________________________  Number: _____________________________
   Specialty: _____________________________  Number: _____________________________
   Specialty: _____________________________  Number: _____________________________
   Specialty: _____________________________  Number: _____________________________
   Specialty: _____________________________  Number: _____________________________
   Specialty: _____________________________  Number: _____________________________
   Specialty: _____________________________  Number: _____________________________

4.2 Nonmedical personnel

   Dentists ...............................  Number: _____________________________
   Bioanalysts ...............................  Number: _____________________________
   Psychologists ............................  Number: _____________________________
   Sociologists .............................  Number: _____________________________
   Anthropologists ..........................  Number: _____________________________
   Social workers ...........................  Number: _____________________________
4.3 Employees and workers

i) Number of employees _______________________________________

ii) Number of workers _______________________________________

5. Transportation and mobilization resources

5.1 Number of ambulances: _______________________________________

5.2 Other transportation vehicles (specify):

<table>
<thead>
<tr>
<th>Type</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td>Type</td>
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</tr>
<tr>
<td>Type</td>
<td></td>
</tr>
</tbody>
</table>

5.3 Access and transportation facilities

i) If there is a heliport near the facility, indicate:
   a. Geographic location: _______________________________________
   b. Distance between the heliport and the facility: _______________

ii) If there is an airport or landing strip near the facility, indicate:
   a. Geographic location: _______________________________________
   b. Characteristics: ___________________________________________

iii) If there is a port near the facility, indicate:
   a. Geographic location: _______________________________________
   b. Distance between the port and the facility: _______________
   c. Characteristics: ___________________________________________

iv) Indicate the name and best means of access to the facility:
    __________________________________________________________________
    __________________________________________________________________
    __________________________________________________________________

6. Emergency plans

6.1 If there is an emergency plan, indicate the following (attach a copy of the plan):

i) Has the plan been put into practice?

   Yes ☐   No ☐   Dates: ________________________________
ii) Have emergency or disaster simulation exercises been carried out?

☐ Once
☐ Several times (how many?) ___________________________
☐ Periodically (how often?) ___________________________
☐ Never

iii) If simulation exercises have been held, what have been the results?

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
Annex 3: List of drugs and equipment for major disasters

1) Antibiotics, different types of antibiotics to cover and treat infections already established and infections expected in nonoptimal treatments of this type.

2) Oral, intramuscular, and intravenous analgesics.

3) Gauze, elastic, and plaster bandages.

4) Ferrules for immobilization, traction equipment.

5) X-ray plates of different sizes, as well as reagents for mass development of plates.

6) Rubber or vinyl disposable gloves, preferably sterile, for the operating room and handling of patients.

7) Vesical catheters, Foley-type Nos. 10 to 18.

8) Probes for nasogastric suction, different: calibers.

9) Catheters or tubes for thoracic drainage, with equipment and flasks (water-seal type).

10) Sterile, and preferably disposable, operating room robes, sheets, boots, caps, and masks; these are among the most important supplies, since in a state of emergency there may be obstacles to washing and sterilizing clothes. Disposable equipment thus provides an acceptable solution to hospital requirements for a certain period of time.

11) Intravenous solutions and equipment for administering them, preferably in plastic bottles and syringes. The hospital should make local arrangements for the shipment of crystalloid solutions and equipment for administering them. It is important that national inventories be exhausted before international aid is received.

12) Orthopedic material such as plates, pins, screws, and ferrules for managing and treating fractures.

13) Antiseptic solutions (iodized, with hexachlorophene).

14) Creams or pomades (vaseline, furacin, etc.)

As will have been noted, no mention is made of a priority need for the shipment of blood, plasma, or vaccines; these items should be sent only on specific request.
Annex 4: Design considerations for disaster-prone hospitals

Introduction
The types of disasters that may occur during the useful life of the hospital are earthquakes, fires, floods, and explosions. The frequency and intensity of these phenomena will differ according to the building's location. Owing to the highly important function performed by hospitals in times of disasters, the safety provisions for the protection of human lives and equipment are the same regardless of the type of disaster.

Minimum requirements to be met by all hospitals are discussed below.

Structure
° The structure should be designed in accordance with the national anti-seismic regulations. In the absence of national regulations, the use of the Uniform Building Code (U.B.C.) of California (USA), is recommended.
° It will be necessary to calculate the seismic risk over the useful life of the building, using attenuation coefficients appropriate to the place. The structure will be designed for the highest-intensity earthquake expected during that period.
° The construction materials used should be reinforced concrete or steel, depending on the availability and cost of each. In all cases, the parts of the structure should be reinforced to attain a 180-minute resistance to fire (RFA 180). The inner walls and partitions should be RFA 120.
° Stairwells should be located so as not to produce a torque effect on the structure when it is subjected to horizontal forces.
° The structure of the stairways should have the same resistance to fire specified for the structure of the building.

Location within the property
The main façade of all buildings should face a public thoroughfare and another façade should face a private street or inner court at least 10 m wide where vehicles can enter.

Isolation of areas
Anesthesia and pharmacy rooms and other areas used for storing dangerous supplies such as chemical reagents, radioactive materials, fuel, etc., should be isolated compartments protected with fireproof walls. In buildings four or more stories high, bedroom areas and escape routes should be compartmentalized.

Escape routes
° All doors should open in the direction of traffic exiting through an escape route. Automatically closing doors with "antipanic" locks should be installed in places designed to accommodate 50 or more people. Hospital and infirmary exits should be at least 1.20 m wide.
° Wards of 15 or more persons should have at least two exits, one at each end.
° Ward exits should open directly onto hallways.
° Hallways should be at least 1.5 m wide. A hallway along which beds or stretchers are moved should be at least 2.40 m wide.
° In buildings of two or more stories, ramps should be provided as part of the escape route so that bed patients may be evacuated.
° All doors opening onto an escape route should be at least 1.10 m wide.
Signs

- The following signs should be put in place: a) signs indicating the escape routes; b) signs indicating equipment; and c) building layout diagrams. "Exit" signs should be placed at all emergency exit doors and at doors providing access to escape routes and stairways. These signs should be placed over the door at a height 2.25 m above the floor.
- All signs should be lit as long as the building is occupied.
- All buildings should contain diagrams showing the location of the various types of alarms and firefighting equipment. Such diagrams should be placed on each floor of the building in places where they are visible to personnel in the building.
- All firefighting equipment that can be used by the staff should have precise instructions beside the equipment itself.
- A diagram showing a person's location in relation to escape routes should be installed in each area.

Fire detection, alarm, and control equipment

- Ionic-type, linear-operation fire detection equipment should be installed at the rate of one detector for every 50 m2 of floor space. The building should have an alarm center, preferably in the basement.
- The building should be equipped with ABC type portable extinguishers with a capacity of at least 10 lbs. There should be one extinguisher for every 200 m2 of floor space and at least one per floor. An extinguisher should never be more than 20 m away.

Services

Water supply

- The fire extinguishing system should consist of a tank with a capacity of at least 30 m3, a pumping system capable of providing a pressure of 75 lbs./inch2, and galvanized iron piping. The system's distribution line should be independent of the building's normal supply system.
- The diameter of the piping should never be less than 2 inches. The building should have a built-in automatic extinguisher system with automatic sprinklers. There should be one sprinkler for every 15 m2 of floor space.

Drains

The drainage system should be of the separator type; if there is no connection to the public sewer system, a septic tank or seepage pit should be provided.

Contaminants and/or radioactive materials

If it is necessary to dispose of this type of material within the perimeters of the hospital, an underground reinforced concrete tank should be constructed as far away from the building as possible. The tank should be covered by a layer of soil at least 2 m thick.

Drills

Simulation exercises for any type of disaster should be conducted at least once a year.

Each member of the hospital should be assigned a specific function to facilitate evacuation of the building.
Annex 5: Energy and communications

Electric energy
The following points should be checked with respect to the hospital's electrical installations.

1) That plans of the installations are available and up-to-date.

2) Is the switchover to the emergency power plant automatic or manual?

3) If automatic, check to see that it is operating normally; if it is not, determine the procedure to be followed to transfer the load.

4) If the switchover is normal, step-by-step instructions for transferring the load should be available in an accessible place.

5) How long are the emergency plant's fuel reserves designed to last?

6) Check the equipment once a month.

7) Keep the fuel tank full.

8) Identify the equipment and installations that operate with the emergency plant.

If the hospital does not have an emergency plant, a generator with at least 40 per cent of the transformer capacity of the hospital substation should be requested. In so doing, it is important to know the cycles (60 or 50 Hz) of the generator required, the type of connection to the distribution line (delta or star), and the voltage of the hospital's system. The following steps should be taken:

1) Determine where the generator will be placed and how it will be connected. Bear in mind noise and contamination problems.

2) Determine the fuel consumption of the generator to be installed, per 24-hour period.

3) Determine how fuel is to be supplied to the generator to keep it in operation.

4) Have a diagram showing the distribution boxes that must be disconnected in order for the generator to function correctly.

   It is imperative to know the source of electric supply for the x-ray equipment:

   a) if it is connected to the main distribution box, it may be fed by either the hospital's emergency plant, if one exists, or by the generator furnished for the emergency;

   b) if the x-ray equipment has its own feeder system, it will be necessary to install a generator solely for that equipment; its capacity should be that of the x-ray equipment. Steps 1, 2, and 3 above should be considered.
It should be ascertained whether there is a special system to provide emergency service in operating rooms and intensive care units. This system makes it possible to provide an uninterrupted energy supply to those areas. It should be noted that the emergency system is an alternative to those described above and refers to a direct current system.

It is necessary to check the batteries (charge and acid) at least once a week. It is also important to know exactly how long the batteries will continue to hold the charge with all the equipment in operation and ascertain the source of power for charging the batteries in the event of failure of the power distribution network. Finally, it is important to know the hospital substation's transformer capacity.

**Communications service**

The hospital's communications diagrams should be available and updated. The following should be taken into account for this purpose:

5) Determine the point of origin of the telephone trunk lines feeding the hospital.

6) Determine how the communications equipment is supplied with energy in the event of a failure in the power distribution network:
   a) whether it will be fed by the hospital's emergency plant (the hospital's own generator or a borrowed one); or
   b) whether it will be fed by a generator operating exclusively for hospital communications;
   c) determine the size of the generator in relation to the communications system's load, cycles (50 or 60 Hz), type of connection, and feeder voltage of the communication network;
   d) know where the generator will be placed and how it will be connected;
   e) determine the generator's consumption of fuel in a 24-hour period and the type of fuel it uses.

7) Locate and identify all of the hospital's secondary telephone lines.

8) Locate all the loudspeakers of the hospital's public address system.

9) Check the operation of the telephone switchboard and the public address system, if any. Preferably, there should be a switchboard for the reserve loudspeakers and the use of the switchboards should be alternated.

10) Check the operation of the blinker paging system or any hospital communication equipment at least once every two weeks.

11) Have in mind a place for locating and feeding a set of equipment for communication with the outside world in the event of failure of the telephone lines. Preferably, the hospital should always have equipment of this type on hand and its operation should be checked daily.

12) It is further recommended that some battery-operated portable speakers be kept on hand for emergencies.
Annex 6: First aid training checklist

1. Definition, scope, and purposes of first aid. Legal scope.
2. Vital signs, pulse, temperature, arterial pressure.
3. Wounds and hemorrhages.
4. Burns.
5. Bandages and immobilization techniques.
6. Transportation of the wounded and rescue of casualties.
7. Accident prevention.
11. Natural disasters (their characteristics).
Annex 7: Model triage tag

METTAG

In June 1977 the Emergency Medical Services Commission of Metropolitan Chicago endorsed METTAG (Medical Emergency Triage Tag) as the standardized field triage disaster tag. Source: METTAG, Journal of Civil Defense, P.O. Box 910, Starke, Florida, 32091.
Annex 8: Classification card

(Attach to patient’s wrist)  Date: ________________________________

Time: _____________________  □ a.m.  □ p.m

Card No.______________________

Code:  Minor: (yellow)
       Major: (red)
       Dead: (white)

Name: _____________________________________________________

Address: _________________________________________________________________

Telephone: _______________________________________________________________

Religion: _____________________________  Age:__________  Sex: □ M  □ F

Diagnosis: __________________________________________________________________

Category:  □ Minimum treatment:  Room:_________________

□ Immediate treatment:

□ Delayed treatment:

□ Expectant treatment:
Annex 9: Medical orders record sheet

Treatment:  
Dose: ____________  Hour: _____________________
Dose: ____________  Hour: _____________________
Dose: ____________  Hour: _____________________
Dose: ____________  Hour: _____________________
Dose: ____________  Hour: _____________________

Signature: _____________________________

Medical Orders:  
___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________

Final Diagnosis:  
___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________

Signature (Dr.)  
___________________________________________________________________________
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