FIELD MANUAL
FOR CAPACITY ASSESSMENT OF HEALTH FACILITIES IN
RESPONDING TO EMERGENCIES
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**Introduction**

The term *health facility* refers to a hospital, clinic, outpost or institution that provides comprehensive medical care to a significant number of people in a given area. Health facilities play a pivotal role in the everyday life of communities. In most instances, the services they render are the primary means of addressing public health needs. By providing emergency services and 24 hour operation during disasters, community dependence on health facilities is greatly magnified and they will be seen as the main resource for prompt diagnosis and treatment.\(^1\) The survival and treatment of the greatest number of disaster victims will largely depend on a facility’s preparedness in dealing with the public health consequences of a disaster.

**Objective of Preparedness Assessment**

Emergency preparedness is a necessity at all levels of the community. For a health facility, this involves a logical process: \(^2\)

The series of activities range from the formulation of emergency preparedness policies to continuous improvement and fine-tuning of institution practices through constant monitoring and evaluation. Following this process assures the health facility that all important aspects of emergency preparedness are adequately addressed.

The interaction between a health facility’s *susceptibility* (inherent factors in a facility that allows a hazard to cause an emergency) and *resilience* (the ability of the facility to withstand damage caused by an emergency) determines its vulnerability.\(^3\) A health facility’s preparedness for emergencies is based on a sound assessment of vulnerability. Performing regular vulnerability assessments allows a health facility to effectively identify and modify factors that increase its susceptibility and decrease its resilience. This creates a foundation for effective prevention within the broader context of sustainable development.

Vulnerability Assessment also follows a logical process:

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The entire process begins by defining the objectives and scope of the vulnerability assessment and the identification of intended tasks and needed resources. The formation of a planning group facilitates coordination between activities and key players in the facility. Once this groundwork is in place, hazards facing the health facility can be identified, described, and evaluated with regard to possible effects on the facility’s operation. The results of this assessment, coupled with other emergency management activities, will guide the formulation of an emergency plan of action.4

The effectiveness of a health facility’s emergency plan of action, therefore, is built on a sound assessment of its vulnerability. A keen awareness of current strengths and weaknesses will enable the management team to efficiently take action steps in order to enhance the preparedness of the health facility for emergency situations.

**Using the Manual**

Although the present title deviates from the original publication, *Protocol for Assessment of Health Facilities in Responding to Emergencies* (WHO, 1999), this document serves as an updated second edition. Similar to the first edition, this updated edition is a management tool for health professionals evaluating the preparedness of their respective health facilities for dealing with disasters. The needs of professionals who manage health facilities, including national and provincial emergency coordinators and regional emergency focal points, were kept in mind during revision of the original manual. The authors utilized input from several representatives in different public health fora in order to validate the applicability and usefulness of guidelines. It must be emphasized, however, that the recommendations given in this publication are not meant to be prescriptive. Rather, readers are advised to view the entire process as a form of self-assessment for every facility and customize the application of the evaluation according to the resources, capabilities, and acceptable norm in their respective regions.

The manual is divided into three main parts. We recommend that the reader accomplish the Main Questionnaire found in the first part of the manual prior to using the other sections. The questionnaire, presented in a checklist format, will provide an overview of the health facility’s present capabilities. The reader can then deepen this awareness by delving into the details offered in succeeding sections. The second part, *Assessment of General Emergency Preparedness*, deals with aspects of preparedness in any level of emergency. Here, evaluation is to be done within the context of three basic elements: *Structural vulnerability*, *Non-structural vulnerability*, and *Functional vulnerability*. The third part, *Assessment of Preparedness for Specific Emergencies*, is the major addition to this updated edition. This section tackles specific emergencies that are becoming increasingly relevant: *Industrial Emergencies*, *Infectious Disease Outbreaks*, and *Biological, Chemical and Radiologic Emergencies*.

The manual presents a series of evaluation checklists that were formulated based on information from current literature. By correlating findings with current data, formulated action plans will be more effective and relevant according to

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the facility’s needs. Definitions and relevant case studies are provided whenever possible. Additional data are given in the Appendix Section of the document for reference purposes.

It is the authors’ hope that this manual will help health facilities in the region make a realistic and sustainable difference in their respond to emergencies.
Part I  Questionnaire for Capacity Assessment of Health Facilities in Responding to Emergencies

The questionnaire serves as an evaluation tool that tackles both general and specific emergencies. The reader is encouraged to complete the entire questionnaire and then analyze the results using the essential details presented in the succeeding sections.

I. General Information

1. When was the health facility built? ___________________________

2. What is the bed capacity? _____

3. How many operating rooms does your facility have?
   ____ 1
   ____ 2
   ____ 3
   ____ > 3, specify : _____

4. How many stretchers (used for transporting patients) does the facility have?
   _____

5. Where are the stretchers placed when not being used? (Please check all applicable areas.)
   _____ ER
   _____ Waiting area
   _____ Ward area
   _____ Storage room
   _____ Lobby
   _____ Others, specify: __________________

6. How many wheelchairs does the facility have? ________

7. Where are wheelchairs placed when not in use? (Please check all applicable areas.)
   _____ Nurses’ station
   _____ Ward area
   _____ Treatment room
   _____ Storage room
   _____ Lobby
   _____ Others, specify: __________________

8. Where are the carts used for transporting and storing medical supplies located? (Place the number of carts found in all the applicable areas.)

<table>
<thead>
<tr>
<th>No. of carts</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. nurses’ station of each ward</td>
</tr>
<tr>
<td>b. emergency department</td>
</tr>
</tbody>
</table>
9. Are there extra beds in the facility?
   _____ Yes
   _____ No

If you answered yes, please proceed to questions 9a-9b; otherwise go to question 10.

9a. Where are they located? (Please check all applicable areas.)
   _____ Rooms
   _____ Receiving areas
   _____ Stock rooms
   _____ In-patient areas
   _____ Visiting rooms
   _____ Others, specify: _______________________

9b. Are the beds secured in place?
   _____ Yes
   _____ No

If you answered yes, please proceed to question 9c; otherwise go to question 10.

9c. If yes, how? (Please check all applicable methods.)
   _____ Wheel lock
   _____ Manually fastened
   _____ With metal
   _____ With wood
   _____ With rope
   _____ Others, specify: _______________________

10. Has the health facility experienced any form of disaster during the last 10 years?
    _____ Yes
    _____ No

If you answered yes, please proceed to questions 10a-10c; otherwise go to question 11.

10a. What is the nature of the disaster? (Please check all applicable answers.)
    _____ Earthquake
    _____ Landslide
    _____ Tsunami
    _____ Typhoon
    _____ Fire
    _____ Volcanic eruption
10b. Was evaluation of the structural integrity of the building done after the disaster?
   ____ Yes
   ____ No

10c. Has the facility suffered any structural damage due to the said disaster?
   ____ Yes
   ____ No

*If you answered yes, please fill in the table below; otherwise go to question 11.*

<table>
<thead>
<tr>
<th>Nature of disaster</th>
<th>Date of Occurrence</th>
<th>Structural Damage</th>
<th>Repairs Done</th>
<th>Cost of Repairs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. Has the facility responded to an external disaster situation in the past?
   ____ Yes
   ____ No

*If you answered yes, please fill in the table below; otherwise proceed to question 12.*

<table>
<thead>
<tr>
<th>Nature of Disaster</th>
<th>Date of Occurrence</th>
<th>Total Number of Casualties</th>
<th>Number of Casualties Treated by the Health Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

II. **Assessment of Structural Vulnerability**

12. Where is the health facility located? *(Please check appropriate answer/s.)*
   ____ On a slope
   ____ On a valley
   ____ On top/close to active faults
   ____ On a plain/flat land
On a flood plain  
In a tsunami prone area  
On a highly elevated area  
Others, specify: _____________

13. How many buildings does the institution have?
   ___ 1
   ___ 2
   ___ 3
   ___ >3, specify: _____________

14. Is/Are the shape/s of the building/s symmetrical?

<table>
<thead>
<tr>
<th>Building</th>
<th>Symmetry</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

15. Is/Are the shape/s of the building/s simple or complex?

<table>
<thead>
<tr>
<th>Building</th>
<th>Shape</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Simple</td>
</tr>
</tbody>
</table>

16. How many stories do the buildings of the institution have?  
(Please fill in the table below.)

<table>
<thead>
<tr>
<th>Building</th>
<th>No. of Stories</th>
</tr>
</thead>
</table>

17. What is/are the angle/s of the roof/s on the health facility building/s?  
(Please fill in the table below.)

<table>
<thead>
<tr>
<th>Building</th>
<th>Roof Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1°-&lt;10°</td>
</tr>
</tbody>
</table>
18. Are ramps present in appropriate areas of the health facility for moving bed patients and for use by people with disabilities?
   _____ Yes
   _____ No

19. What is the main material used in the construction of the buildings?
   _____ Reinforced concrete
   _____ Brick masonry
   _____ Wood
   _____ Others, specify: __________________________

20. Were there any major alterations done in any of the buildings of the health facility?
   _____ Yes
   _____ No

   If you answered yes, please fill in the table below; otherwise proceed to question 21.

<table>
<thead>
<tr>
<th>Building</th>
<th>Alteration done</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

III. Assessment of Non-Structural Vulnerability

21. Which of the following are available in your institution? (Please fill in the table below.)

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Present in the health facility?</th>
<th>No. of units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Central Air-conditioning Unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric Generators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X-ray Equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boiler</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CT-Scan Machine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrotherapy Pool</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRI Machine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respirators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anesthesia Machine</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

22. Where are the following located? (Please put the number of units in the appropriate spaces.)

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Building location</th>
<th>Basement</th>
<th>Ground Floor</th>
<th>Second Floor</th>
<th>Third Floor</th>
<th>Above 3rd Floor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Air-Con Unit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X-ray Equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
23. How are the following anchored? *(Please check all appropriate spaces.)*

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Anchorage</th>
<th>Material</th>
<th>Location of Anchorage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Attached to wall</td>
<td>Not anchored</td>
<td>Use of metal</td>
</tr>
<tr>
<td>Central Air Conditioning Unit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X-ray Equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CT Scan Machine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRI Machine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric Generators</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boilers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrotherapy Pools</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respirators</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suction Machines</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrigerator/Freezer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Television Sets</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

24. Where do you store chemicals? *(Please check all applicable answers.)*

- ____ Storage with shelves
- ____ Storage without shelves
- ____ On top of cabinets
- ____ On the floor
- ____ Others, specify: ____________________________

25. Where do you store other potentially hazardous substances? *(Please check all applicable answers.)*

- ____ Storage with shelves
- ____ Storage without shelves
- ____ On top of cabinets
- ____ On the floor
- ____ Others, specify: ____________________________

26. Are these storage containers anchored?

- ____ Yes
- ____ No

*If you answered yes, please proceed to question 26a; otherwise go to question 27.*
26a. How are these storage containers anchored?
   ____ At the base
   ____ At the sides
   ____ On top
   ____ All of the above

27. Who is/are responsible for storage and safekeeping of these chemicals and substances?
   ____ Laboratory technician
   ____ Utility personnel
   ____ Others, specify: ______________________

28. Did the personnel in charge of handling and storing the chemicals and potentially hazardous substances receive proper training regarding his/her tasks?
   ____ Yes
   ____ No

29. Are guidelines set by Material Safety Data Sheets (MSDS) being followed with regard to the storage, handling, and disposal of these chemicals and substances?
   ____ Yes
   ____ No

IV. Assessment of Functional Vulnerability

A. Site and Accessibility

30. Is the health facility located in the town/city proper?
   ____ Yes
   ____ No

   If you answered no, please proceed to questions 30a-30b; otherwise go to the box after question 30b.

   30a. How far is the facility from the main town/city? ________________

   30b. Is the facility separated from the main town/city by a bridge?
       ____ Yes
       ____ No

31. Is the health facility located along the main street/highway?
   ____ Yes
   ____ No

   If you answered no, please proceed to question number 31a; otherwise go to question 32.

   31a. How far is the facility from the main street/highway? ________________
32. How many roads lead to the health facility?
   ____ 1
   ____ 2
   ____ 3
   ____ >3, specify: ____________

33. What are the conditions of the roads that lead to the health facility?
   (Please fill in the table below.)

<table>
<thead>
<tr>
<th>Road</th>
<th>No. of lanes</th>
<th>Road Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Well paved, no potholes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Paved but with potholes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unpaved</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B. Areas in the Health Facility

34. What are the major areas of your institution? (Please check all applicable answers.)
   ____ Administration
   ____ Ambulatory Care Units (Outpatient)
   ____ General Services
   ____ Emergency Services
   ____ In-patient Care Units
   ____ Laboratory
   ____ Pharmacy
   ____ Radiology
   ____ Operating Rooms
   ____ Others, specify: ________________

35. Where are the points of entry to the health facility? (Please check all applicable answers.)
   ____ ER area
   ____ Administration area
   ____ OPD area
   ____ Others, specify: __________________

36. What comprise the General Services area? (Please check all applicable answers.)
   ____ Boilers
   ____ Kitchen area
   ____ Laundry area
   ____ Communication
   ____ Machinery area
   ____ Storeroom
   ____ Others, specify: __________________
37. Is the General Services area located in a separate building?
   _____ Yes
   _____ No

38. What specific areas of the health facility can be converted into spaces for patients during disaster situations? (Please check all applicable answers.)
   _____ Waiting areas/lobby
   _____ Physician’s offices
   _____ Parking lots
   _____ Physiotherapy room
   _____ Park/ free area
   _____ Outpatient consultation
   _____ Diagnostic and treatment room
   _____ Others, specify: __________________

39. What provisions are located in these areas? (Please check all applicable answers.)
   _____ Adequate lighting
   _____ Electrical outlets
   _____ Water supply
   _____ Bathroom
   _____ Telephone outlets
   _____ None

C. Equipment and Supplies

40. Are the following equipment/supplies available in your institution? (Please fill in the table below.)

<table>
<thead>
<tr>
<th>Equipment/Supply</th>
<th>No. of units available</th>
<th>Functional</th>
<th>Properly labeled</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Stethoscope, adult</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Stethoscope, pediatric</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Sphygmomanometer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Thermometer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Tongue depressors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Light source (flashlight)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Tape measure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. Vision testing chart (Snellen)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Reflex hammer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>j. Head mirror</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>k. Mirror, laryngeal set</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>l. Otoscope set</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m. Pelvimeter (Collyer, external)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n. Speculum, nasal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>o. Scale, spring/infant</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
### Field Manual for Capacity Assessment of Health Facilities in Responding to Emergencies

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>p.</td>
<td>Scale, adult</td>
</tr>
<tr>
<td>q.</td>
<td>Ambu-bags (infant, child, adult with masks)</td>
</tr>
<tr>
<td>r.</td>
<td>Laryngoscope</td>
</tr>
<tr>
<td>s.</td>
<td>Suction Machine</td>
</tr>
<tr>
<td>t.</td>
<td>Oropharyngeal airway</td>
</tr>
<tr>
<td>u.</td>
<td>Endotracheal tubes with cuffs</td>
</tr>
<tr>
<td>v.</td>
<td>Intubating forceps</td>
</tr>
<tr>
<td>w.</td>
<td>Endotracheal tube connectors</td>
</tr>
<tr>
<td>x.</td>
<td>Examination table</td>
</tr>
</tbody>
</table>

#### 41. Are there stocks of the necessary supplies and equipment in the health facility?
- **Yes**
- **No**

#### 42. Is inventory of resources done by the institution?
- **Yes**
- **No**

*If you answered yes, please proceed to questions 42a-42b; otherwise go to question 43.*

**42a.** How often is the inventory conducted?
- **Every month**
- **Quarterly**
- **Annually**
- **Others, specify:** _______________________

**42b.** What benefits have been realized from this practice? *(Please check all applicable answers.)*
- **Identification of resources needed for effective emergency management**
- **Identification of resources currently available within the community**
- **Identification of variation (shortfall/surplus)**

#### 43. Is there a detailed list showing the destination (intended use) of these supplies?
- **Yes**
- **No**

#### 44. How many months of supplies (medical and surgical items, essential medicines and other supplies) are stocked for use by the health facility?
- **1 month**
- **2 months**
- **3 months**
- **>3 months, specify:** _______________________

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**13**
45. Is there an arrangement with vendors regarding procurement of supplies and equipment during a disaster?
   _____ Yes
   _____ No

46. Does the health facility have a system in place for emergency procurement of supplies?
   _____ Yes
   _____ No

   If you answered yes, please proceed to question 46a; otherwise go to question 47.

46a. How long does the procurement of supplies take under emergency conditions?
   _____ 1 week
   _____ 2 weeks
   _____ 3 weeks
   _____ Others, specify: _______________

47. Is there an arrangement for sharing resources with other health facilities and / or potential emergency suppliers of resources?
   _____ Yes
   _____ No

48. Is rotation of items with expiry dates done?
   _____ Yes
   _____ No

49. Who coordinates resource allocation? (Please check all applicable answers.)
   _____ Staff of emergency controller
   _____ Administrative staff
   _____ Volunteers
   _____ Others, specify: _______________

50. Does your health facility have an emergency kit?
   _____ Yes
   _____ No

   If you answered yes, please proceed to questions 50a-50b; otherwise proceed to question 51.

50a. Are the contents of your emergency kit consistent with the WHO’s prescribed New Emergency Health Kit?
   _____ Yes
   _____ No

---

5 An emergency controller is a member of the emergency planning group who is assigned the responsibility of controlling and coordinating the entire emergency response.
50b. Are the following medicines included in your emergency kit?

<table>
<thead>
<tr>
<th>MEDICINE</th>
<th>Yes</th>
<th>No</th>
<th>No. of units available</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anesthetics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ketamine, 50mg/ml in 10-ml vial (as hydrochloride), for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thiopental, 1 g (sodium salt), powder for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lidocaine</td>
<td>1%</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Bupivacaine, 0.5% (as hydrochloride), for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pre-operative medication</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atropine, 1 mg/ml (as sulfate), for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diazepam, 5 mg/ml in 2-ml ampoule, for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Analgesics, Antipyretics, NSAIDS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acetylsalicylic Acid</td>
<td>300 mg tablet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>500 mg tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ibuprofen</td>
<td>200 mg tablet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>400 mg tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paracetamol</td>
<td>100 mg tablet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>500 mg tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morphine, 10mg/ml (as sulfate or hydrochloride), for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pethidine, 50 mg/ml (as hydrochloride), for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Anti-allergics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epinephrine, 1 mg/ml (as hydrochloride or hydrogen tartrate), for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrocortisone, 100 mg in vial (as sodium succinate), powder for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prednisolone, 5 mg tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Antidote</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Naloxone, 0.4mg/ml (as hydrochloride), for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Anti-convulsants</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phenobarbital, 50 mg tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phenytoin, 50 mg (as sodium salt) capsule or tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Anti-infectives</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Intestinal anthelminthics</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mebendazole, 100 mg tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Antibacterials</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amoxicillin, 250 mg capsule or tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ampicillin, 500 mg (as sodium salt), powder for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzylpenicillin, 3 g (5 million IU), (as sodium or potassium salt), for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## MEDECINE

<table>
<thead>
<tr>
<th>MEDICINE</th>
<th>Yes</th>
<th>No</th>
<th>No. of units available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloxacillin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>500 mg (as sodium salt), powder for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>500 mg tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phenoxympenillin, 250 mg tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procaine Benzylpenicillin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 g (1 million IU)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 g (3 million IU), powder for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>250 mg capsule</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 g (as sodium succinate), powder for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doxycycline, 100 mg (as hyclate or monohydrate)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erythromycin, 250 mg (as stearate or ethyl succinate)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capsule or tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gentamycin, 40 mg/ml (as sulfate), for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metronidazole,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200 mg tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>250 mg tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>500 mg/100 ml, injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfamethoxazole + Trimethoprim</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 mg + 20 mg tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>400 mg + 80 mg tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anti-fungals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nystatin, 100,000 IU non-coated tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anti-malarials\a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chloroquine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 mg tablet (as sulfate or phosphate)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>150 mg tablet (as sulfate or phosphate)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quinine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200 mg (as sulfate) tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300 mg (as bisulfate) tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300 mg/ml, for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfadoxine + Pyrimethamine, 500 mg + 25 mg tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mefloquine, 250 mg tablet \b</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anti-anemia Medications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ferrous sulfate + folic acid, 200 mg + 0.25 mg tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Folic acid, 5 mg tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plasma substitutes \c</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polygeline, 3.5% injectable solution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiovascular Medications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glyceryl trinitrate, 0.5 mg sublingual tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydralazine, 20 mg (as hydrochloride), powder for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atenolol, 50 mg tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methyldopa, 250 mg tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dermatological Medications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anti-fungals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzoic Acid + Salicylic Acid, 6% + 3% ointment or cream</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anti-infectives</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methylosanilinium chloride (gentian violet), 0.5% aqueous solution or crystals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silver sulfadiazine 1% cream</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Scabicide and pediculicide
- Benzyl benzoate, 25% lotion
- Soap

### Ultraviolet-blocking agent
- Zinc oxide, 15% ointment

### Disinfectants and antiseptics
- Chlorhexidine $^4$, 5%(digluconate) solution, for dilution
- Polyvidone iodine, 10% solution
- Calcium hypochlorite, 70% available chlorine, powder for solution

### Diuretics
- Furosemide, 10mg/ml, for injection
- Hydrochlorothiazide, 25 mg tablet

### Gastrointestinal medications
#### Antacid
- Aluminum hydroxide, 500 mg tablet
- Magnesium trisilicate compound, 500 mg tablet

#### Anti-emetic
- Promethazine, 25 mg tablet
  - 25 mg/ml, for injection

### Oral rehydration
- Oral rehydration salts, powder for solution

### Contraceptives
#### Hormonal
- Ethinylestradiol + levonorgestrel, 30 ug + 150 ug tablet

#### Barrier
- Condoms, with or without spermicide

### Muscle relaxants
- Alcurinium, 5mg/ml (as chloride), for injection
- Neostigmine
  - 0.5mg/ml
  - 2.5mg/ml, for injection
- Suxamethonium, 50 mg/ml (as chloride), powder for injection
- Vecuronium, 10 mg (as bromide), powder for injection

### Ophthalmological preparations
- Tetracycline, 1% (as hydrochloride), eye ointment
- Gentamycin, 0.3% eye drops

### Oxytocics
- Ergometrine
  - 0.2 mg tablet, (as hydrogen maleate)
  - 0.2 mg/ml, for injection
- Oxytocin, 10 IU/ml, for injection

### Psychotherapeutic medications
#### Chlorpromazine
- 25 mg/100mg tablet (as hydrochloride)
- 25 mg/ml, for injection

### Anti-asthma
- Aminophylline, 25 mg/ml, for injection
- Salbutamol
  - 4 mg/tablet (as sulfate)
  - 0.1 mg per dose aerosol

### Parenteral solutions
### Field Manual for Capacity Assessment of Health Facilities in Responding to Emergencies

<table>
<thead>
<tr>
<th>Glucose</th>
<th>5% isotonic, injectable solution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50% hypertonic injectable solution</td>
</tr>
<tr>
<td>Sodium chloride, 0.9% isotonic injectable solution</td>
<td></td>
</tr>
<tr>
<td>Compound solution of sodium lactate</td>
<td></td>
</tr>
<tr>
<td>Water for injection, 10 ml ampoule</td>
<td></td>
</tr>
</tbody>
</table>

### Vitamins and minerals

<table>
<thead>
<tr>
<th>Ascorbic acid, 50 mg tablet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retinol</td>
</tr>
<tr>
<td>200,000 IU (110 mg) (as palmitate)</td>
</tr>
<tr>
<td>100,000 IU (5.5 mg) for pregnant women</td>
</tr>
</tbody>
</table>

- Only antimalarials which conform to national malaria treatment guidelines should be used. Failure to do so will have a negative impact on national malaria treatment programmes.
- This medicine should be reserved for therapy of confirmed *Plasmodium falciparum* malaria either known or suspected to be resistant to chloroquine or sulfapyrimethamine.
- Intravenous solutions must always be supplied in plastic containers with an infusion set and needle/s. Glass containers are not acceptable.
- Chlorhexidine 20% should be avoided as it needs distilled water for dilution otherwise precipitation will occur. 5% solution is the WHO standard. Alternatives include the combination of chlorhexidine 1.5% + Cetrimide 15%.

---

51. Does your health facility have the capacity to store blood products?

- Yes
- No

*If you answered no, please proceed to question 51a; otherwise, proceed to question 52.*

51a. Where do you get blood and other blood products? *(Please check all applicable answers.)*

- Commercial blood banks
- Other health facilities
- Blood donors
- Others, please specify: ________________

---

D. Utilities

52. How is water supplied to the health facility? *(Please check all applicable answers.)*

- From a water company
- Deep Well
- Others, specify: ________________________

53. Does the health facility have suitable means of storing water?

- Yes
- No

54. Is there an alternative source/s for water in case the main supply gets cut off?

- Yes
- No
If you answered yes, please proceed to questions 54a-54c; otherwise proceed to question 55.

54a. What is the alternative source of water? ______________

54b. How is the water from the alternative source treated? (Please check all applicable answers.)
   ___ Filtration
   ___ Chlorination
   ___ Sedimentation
   ___ Boiling
   ___ Water tablets
   ___ Not treated

54c. How long would the health facility continue to function using the alternative source of water? ______________

55. How is electricity supplied?
   Voltage:   ___ 110 V   ___ 220 V
   Amperage: ___________
   Cyclage:   ___________

56. Where are the control panels and electric power distribution lines located?
   ____________________

57. Is there an alternative source of electrical supply (emergency power generator)?
   ___ Yes
   ___ No

If you answered yes, please proceed to questions 57a-57c; otherwise proceed to question 58.
57a. What is the capacity of the emergency power generator? _________

57b. What fuel is utilized by the emergency power generator? _________

57c. What proportion (in %) of the facility’s energy requirement can it supply? ________________

58. Does the health facility have emergency lights (for use between periods of power interruption and restoration of electrical supply with generator set)?
   ___ Yes
   ___ No

If you answered yes, please proceed to questions 58a-58b; otherwise proceed to question 59.
58a. How are the emergency lights activated?
   _____ Manual
   _____ Automatic

58b. Where are they located?
   _____ Nurses’ stations
   _____ Emergency room
   _____ Wards
   _____ Operating room
   _____ Individual patients’ rooms
   _____ Laboratory
   _____ Hallways
   _____ Lobby
   _____ Stairwells
   _____ Others, specify: _______________________

59. How are medical gases supplied?
   _____ Main pipeline
   _____ Individual tanks
   _____ Others, specify: _______________________

60. Are there safety measures to ascertain prevention of gas spills/leaks?
   _____ Yes
   _____ No

E. Warning System and Safety Equipment

61. Is there a system of signs instituted in response to a disaster situation?
   _____ Yes
   _____ No

   If you answered yes, please proceed to question 61a; otherwise go to question 62.

61a. What signs are included? (Please check all applicable answers.)
   _____ escape route indicators
   _____ fire-fighting equipment indicators
   _____ building layout diagram

62. Does the institution have fire detection equipment (e.g. smoke alarms)?
   _____ Yes
   _____ No

   If you answered yes, please proceed to question 62a; otherwise go to question 63.

62a. Is the fire detection equipment strategically located?
   _____ Yes
   _____ No
63. Does the institution have fire extinguishers?
   _____ Yes
   _____ No

*If you answered yes, please proceed to questions 63a-63c; otherwise go to question 64.*

63a. How many fire extinguishers does the institution have? __________

63b. Are fire extinguishers strategically located?
   _____ Yes
   _____ No

63c. How often are the fire extinguishers replenished/serviced?
   _____ Once a year
   _____ Once in two years
   _____ As needed
   _____ Never
   _____ Others, specify: ________________________

**F. Security**

64. Does the health facility have a security unit?
   _____ Yes
   _____ No

*If you answered yes, please proceed to questions 64a-64b; otherwise go to question 65.*

64a. Who provides the personnel for the security unit?
   _____ Health Facility
   _____ Private security agency

64b. What areas in the health facility are given top priority in terms of security especially during disasters? *(Please check all that apply.)*
   _____ Entrance / Exit points
   _____ Main thoroughfares
   _____ Storage area for controlled substances
   _____ Storage area for high-value medical equipment
   _____ Others, specify: ________________________________

**G. Transportation and Communication**

65. What forms of internal communication are being used by the institution? *(Please check all the applicable answers.)*
   _____ Regular telephone
   _____ Cellular telephone
   _____ Pager
   _____ Public address system
66. What forms of external communication are being used by the institution? *(Please check all applicable answers.)*

- ____ Telephone with landline
- ____ Cellular telephone
- ____ Pager
- ____ Facsimile machine
- ____ Short-wave radio
- ____ Runners
- ____ Others, specify: ________________

66a. If the health facility is using telephones (whether landline or cellular), what are the alternative forms of communication in case the phone system breaks down? *(Please check all applicable answers.)*

- ____ Short-wave radio
- ____ Runners
- ____ Others, specify: ________________

67. What means of patient transport are used by the institution? *(Please check all applicable answers.)*

- ____ Buses, minibuses and vans
- ____ Ambulance
- ____ Trucks
- ____ Private vehicles
- ____ Boats (if applicable)
- ____ Aircraft (both fixed-wing and helicopters)
- ____ Motorcycles
- ____ Others, specify: ________________

*If your facility has at least one ambulance, please answer question 67a; otherwise, please proceed to question 68.*

67a. What are the capabilities of your ambulance/s? *(Please fill in the table below).*

<table>
<thead>
<tr>
<th>Ambulance capabilities</th>
<th>No. of ambulances in the facility</th>
<th>Personnel assigned to the ambulance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purely for transport, No special equipment</td>
<td></td>
<td>Driver</td>
</tr>
<tr>
<td>With supplies for Basic Life Support</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
With supplies for both Basic Life Support and Advance Cardiac Life Support

Others, specify:

H. Public Information

68. Is there a public information centre in the institution?
   ____ Yes
   ____ No

   *If you answered yes, please proceed to questions 68a-68e; otherwise go to question 69.*

68a. Who coordinates the public information centre? *(Please check all applicable answers.)*
   ____ Social worker
   ____ Administrative staff
   ____ Volunteer
   ____ Others, specify: _______________________

68b. Which personnel are tasked to staff the public information centre?
   *(Please check all applicable answers.)*
   ____ Social workers
   ____ Administrative staff members
   ____ Volunteers
   ____ Others, specify: __________________________

68c. What services are provided at the information centre? *(Please check all applicable answers.)*
   ____ Information about patients admitted and discharged
   ____ Finding addresses and whereabouts of family members of patients admitted to the health facility
   ____ Assisting in the identification of victims
   ____ Assisting family members to locate relatives
   ____ Others, specify: __________________________

68d. Will the Public Information Centre continue to provide the above-mentioned services during disaster situations?
   ____ Yes
   ____ No
   ____ Not sure

68e. Does the Public Information Center have the capacity to coordinate with the following external entities in the event of a disaster? *(Please check all that apply.)*
   ____ National emergency preparedness agency
69. Are there means to create public awareness of the disaster preparedness plan of the institution?
   ___ Yes
   ___ No

If you answered yes, please proceed to question 69a; otherwise go to question 70.

69a. What are these measures? (Please check all the applicable answers.)
   ___ Posters
   ___ Hanging signs
   ___ Signboards
   ___ Public meetings
   ___ Labels on necessary equipment
   ___ Labels on exit doors
   ___ General evacuation route
   ___ Others, specify: ____________________________

70. How is the public informed of a disaster situation in your catchment area? (Please check all applicable answers.)
   ___ Mass media
   ___ Audible and visual signs
   ___ Community network
   ___ Loud speakers
   ___ Door-to-door announcements
   ___ Others, specify: ____________________________

71. What methods are used to disseminate emergency plans to the public? (Please check all applicable answers.)
   ___ Local press
   ___ Radio
   ___ Television
   ___ Public meetings
   ___ Visits to schools, offices, etc.
   ___ Brochures
   ___ Others, specify: ____________________________
V. Assessment of Human Resources

A. Emergency Planning Group

72. Is there an existing emergency planning group in your institution?
   _____ Yes
   _____ No

If you answered yes, please proceed to questions 72a-72e; otherwise go to question 73.

72a. When was this group formed? _________________________

72b. Who are the members of this planning group? (Please check all applicable answers.)
   _____ Health facility chief executive officer
   _____ Chief of medical personnel
   _____ Head of administration
   _____ Director of nursing services
   _____ Public Information Centre head
   _____ Security services supervisor
   _____ Maintenance chief
   _____ Staff representative
   _____ A health department representative
   _____ Engineer
   _____ Architect
   _____ Other organizations with which the health facility may interact in emergency management
   _____ Others, specify: ______________

72c. Are all members of sufficient seniority to commit the organization to planning group decisions?
   _____ Yes
   _____ No

72d. Are they capable of contributing to the planning group’s work?
   _____ Yes
   _____ No

72e. What activities are done by the emergency planning group? (Please check all applicable answers.)
   _____ Hazard/potential problem analysis
   _____ Structural vulnerability assessment
   _____ Non-structural vulnerability assessment
   _____ Functional vulnerability assessment
   _____ Determine operating capacity during disaster situations
   _____ Plan for mobilization of resources
   _____ Define roles and responsibilities of each member/group
____ Ensure training and education of personnel as required
____ Provide for a monitoring and evaluation system for the emergency preparedness program
____ Provide pre-disaster photographic documentation of facility buildings and equipment for insurance purposes
____ Others, specify: ________________

73. What type/s of disaster does the health facility prepare for?
   ____ External disasters only
   ____ Internal disasters only
   ____ Both internal and external disasters

74. Does the health facility have an emergency preparedness plan?
   ____ Yes
   ____ No

   If you answered yes, please proceed to questions 74a-74e; otherwise go to question 75.

74a. Is the health facility emergency plan documented in writing?
    ____ Yes
    ____ No

74b. How often do you evaluate your disaster preparedness plan?
    ____ Semi-annually
    ____ Annually
    ____ Biannually
    ____ Others, specify: ______________________

74c. How do you evaluate your disaster preparedness plan?
    ____ By discussion
    ____ By performing drills
    ____ By performing simulation exercises
    ____ Others, specify: ______________________

74d. When was the plan last updated? ______________________

74e. What is your evaluation of your most recent emergency plan?
    ____ Effective
    ____ Needs changes/improvement

75. Is there an existing/updated organizational chart for disaster situations?
   ____ Yes
   ____ No

   If you answered yes, please proceed to question 75a; otherwise proceed to question 76.
75a. Does the organizational chart follow the structure recommended by the Hospital Emergency Incident Command System (HEICS)?
   ____ Yes
   ____ No

76. How are the members of the emergency planning group made aware of these management roles? (Please check all applicable answers.)
   ____ Distribution of copies
   ____ Regular meetings
   ____ Others, specify: ______________________________

77. How are the members encouraged to actively be involved in preparedness, response or recovery? (Please check all applicable answers.)
   ____ Meetings
   ____ Drills/exercises
   ____ Others, specify: ______________________________

B. Subcommittees

78. Is the emergency preparedness committee divided into subcommittees or subgroups?
   ____ Yes
   ____ No

If you answered yes, please proceed to questions 78a-78d; otherwise go to question 79.

78a. What are these subcommittees/subgroups? (Please check all applicable answers.)
   ____ Health
   ____ Rescue
   ____ Transportation
   ____ Communication
   ____ Mutual assistance and welfare
   ____ Engineering
   ____ Others, specify: ______________________________

78b. Are the roles and responsibilities of these subcommittees/subgroups clearly defined by the planning committee?
   ____ Yes
   ____ No

78c. How are these responsibilities assigned to them?
   ____ According to existing function
   ____ According to assessed capability of a group
   ____ By random selection
   ____ By volunteerism
   ____ Others, specify: ______________________________
78d. What subcommittee/subgroup is directly involved among the following: *(Please identify.)*

<table>
<thead>
<tr>
<th>TASKS/DUTIES</th>
<th>Name of Subcommittee or Subgroup</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 servicing and testing of emergency equipment regularly in accordance with relevant standards and manufacturers’ recommendations</td>
<td></td>
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<tr>
<td>2 providing advice to management regarding new equipment or existing safety equipment</td>
<td></td>
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<tr>
<td>3 implementing a yearly plan of hospital hazard audits to determine that good housekeeping is being maintained and to identify remedial action</td>
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<tr>
<td>4 planning &amp; coordinating emergency planning group meetings</td>
<td></td>
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<tr>
<td>5 disseminating emergency plans</td>
<td></td>
</tr>
<tr>
<td>6 reviewing emergency planning at least once a year</td>
<td></td>
</tr>
<tr>
<td>7 exercising emergency plans at least once a year</td>
<td></td>
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<tr>
<td>8 providing all new, temporary and casual personnel, with a summary of emergency plans at the time of appointment</td>
<td></td>
</tr>
</tbody>
</table>

C. **Inventory of Personnel**

79. How many doctors does your health facility have? *(Please fill in the table below.)*

<table>
<thead>
<tr>
<th>Areas of Specialty</th>
<th>No. of consultants</th>
<th>No. of Residents</th>
<th>No. of Interns</th>
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</thead>
<tbody>
<tr>
<td>Family Medicine</td>
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<td>Internal Medicine</td>
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<tr>
<td>Obstetrics and Gynecology</td>
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<tr>
<td>Pediatrics</td>
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<td></td>
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<tr>
<td>Surgery</td>
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<tr>
<td>Anesthesiology</td>
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<tr>
<td>ENT</td>
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<td></td>
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<tr>
<td>Ophthalmology</td>
<td></td>
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<tr>
<td>Orthopedics</td>
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<td></td>
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<tr>
<td>Others, please specify:</td>
<td></td>
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</tbody>
</table>


80. How many staff members does the health facility have per ward/area? (Please fill in the table below.)

<table>
<thead>
<tr>
<th>Ward/Area</th>
<th>Bed capacity of ward/area</th>
<th>No. of Staff Nurses/Shift</th>
<th>No. of Nursing Aides/Shift</th>
<th>No. of Orderlies/Shift</th>
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</table>

81. How many laboratory/radiology technicians does your health facility have?

<table>
<thead>
<tr>
<th>Laboratory/ Radiology Area</th>
<th>No. of Technicians/Shift</th>
<th>No. of Shifts</th>
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<tr>
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</table>

D. Mobilization of Personnel

82. How are alarms raised during disaster situation? (Please check all applicable answers.)

- [ ] Alarm
- [ ] Bell
- [ ] Megaphone
- [ ] Verbal
- [ ] Siren
- Others, specify: __________________

83. Who may activate the alarm? (Please check all applicable answers.)

- [ ] Special committee
- [ ] Administrator
- [ ] Director of health facility
- Others, specify: __________________

84. Does the administration have an updated list of addresses and telephone numbers of all staff involved in the emergency preparedness plan?

- [ ] Yes
- [ ] No

*If you answered *yes*, please proceed to question 84a; otherwise, proceed to question 85.*
84a. Is the list of addresses and telephone numbers of hospital staff always located in an accessible area?
   ____ Yes
   ____ No

85. Does the health facility have a diagram of the communication network?
   ____ Yes
   ____ No

86. Is there a pre-assigned emergency operations centre (EOC) in the institution?
   ____ Yes
   ____ No

   If you answered yes, please proceed to questions 86a-86b; otherwise go to question 87.

86a. Where is it located? ____________________

86b. Who is/are assigned to run the operation centre?
   ____ Administrative personnel
   ____ Physician
   ____ Nurse
   ____ All of the above
   ____ Others, specify: ________________

87. Does the health facility have an on-site disaster response team?
   ____ Yes
   ____ No

   If you answered yes, please proceed to questions 87a-87b; otherwise go to question 88.

87a. Who are the members of the on-site disaster response team?
   (Please check all applicable answers.)
   ____ ER Physician-on-duty
   ____ Family Medicine Resident-on-duty
   ____ Surgery Resident-on-duty
   ____ ER Nurse-on-duty
   ____ Emergency Medical Technicians (EMTs)
   ____ Volunteers
   ____ Others, specify: ________________

87b. Which of the following are team members trained to do?
   (Please check all applicable answers.)
   ____ Analyze the magnitude of the disaster
   ____ Coordinate efforts of various hospitals/support groups
   ____ Basic Life Support
88. Do you have a pre-assigned area for reception of victims at the health facility?
   _____ Yes
   _____ No

If you answered yes, please proceed to question 88a; otherwise go to question 89.

88a. Where is the pre-assigned area for reception located?
   _____ Inside the emergency room
   _____ Outside the emergency room but inside the health facility
   _____ Outside the health facility
   _____ Others, specify: ________________________

89. Do you have a pre-assigned area for triage in the health facility?
   _____ Yes
   _____ No

If you answered yes, please proceed to questions 89a-89c; otherwise go to question 90.

89a. Where is the pre-assigned area for triage located?
   _____ Inside the emergency room
   _____ Outside the emergency room but inside the health facility
   _____ Outside the health facility
   _____ Others, specify: ________________________

89b. Who is/are tasked with staffing the triage area? (Please check all applicable answers.)
   _____ General Practitioners
   _____ Surgeons
   _____ Internists
   _____ Physicians trained in traumatology
   _____ Nurses
   _____ Volunteers
   _____ Paramedical personnel
   _____ Others, specify: ________________________

89c. What functions are assigned to the triage team? (Please check all applicable answers.)
   _____ Classification of patients according to priority of treatment
____ Referral of patient/s to the appropriate place within the health facility
____ Referral of patient/s to other treatment centres following stabilization
____ Updating the Health Facility Emergency Committee of the situation

90. Do you have an established system for proper categorization and tagging of patients/casualties (e.g. color-coding)?
   ____ Yes
   ____ No

91. Are there specific people assigned to security and crowd-control?
   ____ Yes
   ____ No

If you answered yes, please proceed to question 91a; otherwise go to question 92.

91a. What are these people tasked to do?
   ____ Close off other points of entry that are not vital to the emergency operations of the health facility
   ____ Control the flow of people entering the health facility
   ____ Direct people to appropriate areas inside the health facility
   ____ Act as marshals in case evacuation is necessary
   ____ Others, specify: __________________

E. Hazard and Vulnerability Analysis

92. Has the emergency preparedness group conducted hazard and vulnerability analysis?
   ____ Yes
   ____ No

If you answered yes, please proceed to question 92a-92c; otherwise go to question 93.

92a. What techniques were involved? (Please check all applicable answers.)
   ____ Identification of hazard
   ____ Listing of possible effects
   ____ Listing of potential problems
   ____ Determining causes
   ____ Develop preventive strategies
   ____ Develop response and recovery strategies and trigger events for this strategies
92b. What benefits have been realized from this tool? (Please check all applicable answers.)

_____ Obtained a list of possible hazards
_____ Identified the most likely and damaging hazards
_____ Identified the effects of those hazards in the health facility infrastructure and community
_____ Obtained a firm basis for health facility emergency management planning

92c. What types of hazard does the health facility prepare for? (Please check all the applicable answers.)

_____ Earthquake
_____ Flood
_____ Fire
_____ Tsunami
_____ Hurricane
_____ Volcanic eruption
_____ War/Armed conflict
_____ Epidemic
_____ Infectious Disease Outbreak
_____ Chemical/Radiologic Emergency
_____ Industrial/Technological
_____ Others, specify: __________________

F. Training and Drills

93. Does the institution support the training and education of staff members for emergency preparedness?

_____ Yes
_____ No

If you answered yes, please proceed to question 93a-93d; otherwise go to question 94.

93a. What strategies have been tried? (Please check all the applicable answers.)

_____ Workshops, seminars, conferences
_____ Self-directed learning
_____ Individual tuition
_____ Exercises
_____ Pamphlets, videos, media
_____ Informal/formal presentations
_____ Public displays, meetings
_____ Others, specify: ________________
93b. What stages are involved in training? (Please check all applicable answers.)

- Analyze training needs
- Design training
- Develop instruction
- Conduct instruction
- Validate training

93c. How often does the institution conduct training?

- Biannually
- Annually
- As necessary
- Others, specify: ________________

93d. How many attended the most recent training conducted by the institution?

- (actual number)
- % (proportion of those who attended among those who need to be trained)

94. Is there a regular drill/exercise being conducted in preparation for any disaster occurrence?

- Yes
- No

If you answered yes, please proceed to question 94a-94b; otherwise go to question 95.

94a. How regular are these drills done?

- Quarterly
- Semi-annually
- Annually
- Others, specify: __________________________

94b. Who heads the drills?

- Special committee
- Administrator
- Director of health facility
- Others, specify: __________________________

95. Is there financial support for the training and drills mentioned above?

- Yes
- No

If you answered yes, please proceed to question 95a-95b; otherwise go to question 96.
95a. What are the sources of financial support? *(Please check all applicable answers.)*

- [ ] Donation  
- [ ] Insurance  
- [ ] Allotment from the health facility’s budget  
- [ ] Others, specify: ___________________________

95b. How much is the budget for these preventive measures?

____________/year

G. Evacuation

96. Is there a system for the evacuation of the institution?

- [ ] Yes  
- [ ] No

*If you answered yes, please proceed to question 96a-96c; otherwise go to question 97.*

96a. Which among the following stages of evacuation are being conducted in the institution? *(Please check all applicable answers.)*

- [ ] Warning  
- [ ] Withdrawal  
- [ ] Return

96b. In general, what activities are done in connection with the evacuation? *(Please check all the applicable answers.)*

- [ ] Identifying options of vertical or horizontal evacuation within the health facility  
- [ ] Identifying the type of signal or alarm that will signify an evacuation is required  
- [ ] Outlining the evacuation routes  
- [ ] Identifying the assembly areas  
- [ ] Establishing the means of accounting for evacuees  
- [ ] Anticipating types of support or assistance likely to be required by patients  
- [ ] Establishing the type of “all clear” signal that will be given

96c. Is there an evacuation warden assigned for each part of the health facility?

- [ ] Yes  
- [ ] No

---

6. *Vertical evacuation* within a building involves movement to another floor/storey of a building, while *horizontal evacuation* entails movement to another part of the building within the same floor.

7. An “all clear” signal is an example of a signal given to signify that no imminent danger is present.
H. Health Facility Networking

97. Is your disaster plan coordinated with those of other health facilities in your area?
   _____ Yes
   _____ No

   If you answered yes, please proceed to question 97a-97b; otherwise go to question 98.

97a. Is your coordination part of a formal agreement?
   _____ Yes
   _____ No

97b. Do you perform drills together?
   _____ Yes
   _____ No

I. Community Involvement

98. Does the institution take into consideration the characteristics of its community in responding to emergency situations?
   _____ Yes
   _____ No

   If you answered yes, please proceed to question 98a; otherwise go to question 99.

98a. What characteristics of the community are taken into account?
      (Please check all applicable answers.)
      _____ Demography
      _____ Environment (plants, animals, waters, air and soil)
      _____ Infrastructure
      _____ Culture
      _____ Economy
      _____ Disease pattern
      _____ Others, specify: ________________

99. Does the local community have its own disaster preparedness plan?
   _____ Yes
   _____ No

   If you answered yes, please proceed to question 99a; otherwise go to question 1 in the next subsection.

99a. Is the health facility disaster preparedness plan coordinated with the community disaster preparedness plan?
   _____ Yes
   _____ No
**Part III  Assessment of Preparedness for Specific Emergencies**

I. **Assessment of Industrial Emergency Preparedness**

1. Is there an industrial firm within your health facility’s catchment area?
   _____ Yes
   _____ No

   *If you answered yes, please proceed to question 1a; otherwise, go to question 2.*

1a. What is the distance of the industrial firm from the health facility? ______

2. Is the health facility near a roadway which is frequently used by vehicles conveying potentially hazardous substances going to or coming from industrial firm/s?
   _____ Yes
   _____ No

3. What kind of substances are used or produced by the industrial firms and/or transported by the vehicles? *(Please check all applicable answers.)*
   _____ Acids
   _____ Ammonias
   _____ Bases
   _____ Chlorines
   _____ Cyanides
   _____ Herbicides
   _____ Insecticides
   _____ Polychlorinated biphenyls
   _____ Radioactive substances
   _____ Volatile organic compounds
   _____ Do not know
   _____ Others, specify: _______________________

4. Are antidotes for the substances identified in question number 3 present in your health facility?
   _____ Yes
   _____ No
   _____ Not applicable

   *If you answered yes, please fill in the table below; otherwise, proceed to question no. 5.*

<table>
<thead>
<tr>
<th>Substance</th>
<th>Antidote</th>
<th>Indication</th>
<th># of units in stock</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>
5. Are there nearby sources of antidotes?
   ____ Yes
   ____ No

   *If you answered yes, please fill in the table below; otherwise, proceed to question number 6.*

<table>
<thead>
<tr>
<th>Source</th>
<th>Antidote</th>
<th>Time to reach source</th>
<th>How to reach source</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

6. Is the health facility capable of contacting any poison control or assistance centre?
   ____ Yes
   ____ No

   *If you answered yes, please proceed to question 6a-6d; otherwise, go to question number 7.*

6a. Which poison control/assistance centre can you easily get in touch with?
    __________________________

6b. Is this centre accessible 24 hours a day, everyday of the week?
   ____ Yes
   ____ No

6c. What means can you use to get in touch with the centre? *(Please check all applicable answers.)*
   _____ Telephone
   _____ Short-wave radio
   _____ Internet
   _____ Electronic mail
   _____ Others, specify:_________________

6d. Do all relevant personnel know how to get in touch with the poison control/assistance centre?
   ____ Yes
   ____ No

7. Does the health facility have local experts who may offer assistance in the management of these patients?
   ____ Yes
   ____ No

   *If you answered yes, please proceed to question 7a; otherwise, go to question 8.*
7a. What are their areas of expertise?
   ___ Toxicology
   ___ Pharmacology
   ___ Industrial hygiene
   ___ Occupational medicine
   ___ Chemistry
   ___ Others, specify: ______________________

8. Does the health facility coordinate regularly with the nearby industrial firms and local authorities?
   ___ Yes
   ___ No

If you answered yes, please proceed to questions 8a-8d; otherwise, go to question 9.

8a. What are the areas of coordination that exist?
   ___ Drafting of disaster plans
   ___ Conducting joint hazardous materials disaster drills
   ___ Conducting training seminars regarding industrial disasters
   ___ Conducting periodic medical evaluation of the industrial firm’s employees
   ___ Conducting public information campaign regarding industrial disasters
   ___ Others, please specify: ______________________

8b. Is the health facility constantly updated with regard possible hazards present in nearby industrial firms?
   ___ Yes
   ___ No

8c. What are the health facility’s responsibilities in the event of an industrial disaster?
   ___ Send a team for search and rescue operations
   ___ Act as the primary receiving hospital for victims
   ___ Assist in the transportation of victims to other health facilities
   ___ Others, please specify: ______________________

8d. Who are the identified key players during an industrial emergency? (Please check all that apply.)
   ___ Health facility liaison officer
   ___ Police services
   ___ Fire protection service
   ___ Civil defense agencies
   ___ Public works and utilities
   ___ Industrial firm management
   ___ Public information outlets
   ___ Public health agencies
   ___ Environmental agencies
   ___ Others, please specify: ______________________
9. Does the health facility have adequate amenities for decontamination?
   _____ Yes
   _____ No

10. Does the health facility have the capacity to evacuate its patients and personnel in the event that the facility itself becomes contaminated?
    _____ Yes
    _____ No

   If you answered yes, proceed to questions 10a-10d; otherwise proceed to question 11.

10a. Where do you refer contaminated patients?

<table>
<thead>
<tr>
<th>Referral health facility</th>
<th>Distance from your health facility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

10b. Are there transportation procedures for these patients?

   _____ Yes
   _____ No

10c. Are medical personnel required to accompany the patient/s to other health facility/ies?

   _____ Yes
   _____ No

10d. Is there provision for decontamination of the vehicle/s that transport contaminated patient/s?

   _____ Yes
   _____ No

11. After a significant industrial emergency, does the health facility have the means to follow-up all persons exposed to hazardous substances?

   _____ Yes
   _____ No

   If you answered yes, proceed to questions 11a-11b; otherwise, proceed to question 12.

11a. Are all exposed persons, regardless of presence or absence of symptoms, registered for short- and long-term follow-up?

   _____ Yes
   _____ No

11b. Are biological samples taken from those who were exposed as soon as possible after an incident?

   _____ Yes
   _____ No
12. Are there procedures in place that will accommodate sharing of information regarding the short- and long-term effects of acute exposure to hazardous substances between the health facilities, industrial firms, local government, and other involved parties, after an incident?

_____ Yes
_____ No

II. Assessment of Infectious Disease Outbreak Preparedness

A. Infrastructure Assessment

13. Does the health facility have an existing evaluation or triage area/s for all incoming patients?

_____ Yes
_____ No

*If you answered yes, proceed to questions 13a-13b; otherwise, go to question 14.*

13a. Where is/are the evaluation area/s located? *(Please check all applicable answers.)*

_____ Outside the emergency department
_____ Inside the emergency department
_____ Outside the outpatient department
_____ Inside the outpatient department

13b. In the event of an epidemic, can this area be adequately isolated from the rest of the facility?

_____ Yes
_____ No

14. Are there specially designed infectious disease isolation units in the hospital?

_____ Yes
_____ No

*If you answered yes, proceed to questions 14a-14b; otherwise, go to question 15.*

14a. What provisions are found in these units? *(Please check all applicable answers.)*

_____ Individual rooms
_____ Partitioned beds in one big ward
_____ Negative air pressure
_____ Separate air control / ventilation system
_____ Individual handwashing facilities
_____ Shared handwashing facilities
_____ Individual toilets
_____ Shared toilets
_____ Sealed windows
_____ Self-closing doors
Anterooms with gloving / gown-donning facilities
Separate waste disposal units

14b. What is the total bed capacity of all isolation units? _____

15. What other areas in the facility can be temporarily converted into an isolation unit in the event of an epidemic?

<table>
<thead>
<tr>
<th>Area</th>
<th>Bed Capacity</th>
<th>With Negative Pressure? (Y/N)</th>
<th>Individual rooms? (Y/N)</th>
<th>Separate exhaust? (Y/N)</th>
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16. Is there a heating, ventilation, air conditioning (HVAC) system installed in your facility?
   _____ Yes
   _____ No

*If you answered yes, proceed to questions 16a-16c; otherwise, go to question 17.*

16a. How long has the HVAC system been installed? _______________

16b. What is the ambient temperature in the facility? _______; ambient humidity? _______

16c. How much Air Changes per Hour (ACH) are provided for by the HVAC system? _______

17. Does the facility’s HVAC systems utilize filtration devices?
   _____ Yes
   _____ No

*If you answered yes, proceed to questions 17a-17b; otherwise, go to question 18.*

17a. What kind of filtration devices are currently installed in the hospital?
   _____ Fixed High Efficiency Particulate Air (HEPA) filters
   _____ Portable HEPA filters
   _____ Others, specify: ______________________________

17b. What type of frame, if any, was used for the filters?
   _____ None
   _____ Metal
   _____ Wood
   _____ Plastic
18. Are Ultraviolet Germicidal Irradiation (UVGI) devices installed in the health facility?

- Yes
- No

19. Do isolation units contain pressure-controlled rooms?

- Yes
- No

*If you answered yes, proceed to questions 19a; otherwise, go to question 20.*

19a. Please specify the specific type of pressurization method used.

- Negative room / Airborne Infection Isolation Room (AIIR)
- Variable pressure room
- Others, specify: __________________________

20. When was the present ventilation system installed? _________

21. Does the ventilation system undergo regular inspection?

- Yes
- No

*If you answered yes, proceed to questions 21a-21d; otherwise, go to question 22.*

21a. When was the last formal inspection / maintenance check? _________

21b. How long has it been since the time of installation or last formal inspection? ___________

21c. According to manufacturer’s specifications, how often should maintenance be done? ___________

21d. Who carries out the regular inspection of the ventilation system?

- Manufacturer
- Facility Administrator (Please specify) ______________________
- Government contractor
- Private contractor
- Others, specify: ______________________

*If the facility has pressure-controlled rooms, answer the next question. Otherwise, proceed to question 23.*

22. Are pressure differentials constantly monitored for accuracy?

- Yes
- No

*If you answered yes, go to question 22a; otherwise, go to question 23.*
22a. What indicators are used to determine the direction of air stream?  
(Please check all applicable answers.)

____ Qualitative
   _____ Flutter strips
   _____ Ping-pong balls
   _____ Others, specify: ____________________________

____ Quantitative
   _____ Manometer tests
   _____ Others, specify: ____________________________

23. Are alternative generators available in order to avoid disruption of ventilation control during a power outage?

____ Yes
____ No

If you answered yes, go to question 23a-23b; otherwise, go to question 24.

23a. How long does it take before the alternative power source engages?

________

23b. How long does the back-up power last? ______________

24. In your facility, the following procedures would entail movement / transport of infected patients out of the isolation areas: (Please check all applicable answers.)

____ Radiologic procedures
____ X-ray
____ Ultrasound
____ CT / MRI
____ Minor procedures
____ Thoracentesis
____ Paracentesis
____ Central line insertion
____ Venous cutdowns
____ Intubation
____ Suctioning
____ Major procedures
____ Chest tube insertions
____ Major operations (e.g. thoracotomies, laparotomies, etc.)

25. How many of the following are available for the sole use of infected patients in your health facility?

<table>
<thead>
<tr>
<th>Provision</th>
<th>No. of Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trolleys</td>
<td></td>
</tr>
<tr>
<td>Wheelchairs</td>
<td></td>
</tr>
<tr>
<td>Disposable linen</td>
<td></td>
</tr>
</tbody>
</table>

26. In the event that infected patients have to be transported:
26a. Are there elevators/lifts reserved for these patients?
   ____ Yes
   ____ No

26b. Are there dedicated corridors that will allow these patients to access services as necessary?
   ____ Yes
   ____ No

26c. Are the receiving staff given ample notice prior to any transport / movement?
   ____ Yes
   ____ No

B. Functional Assessment

27. Are the following Personal Protective Equipment (PPE) available in your health facility? *(Please fill in the table below.)*

<table>
<thead>
<tr>
<th>PPE</th>
<th>No. of units</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disposable particulate respirators (N95 or higher)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal air-purifying respiratory hoods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eye protection devices</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Face shields</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disposable gloves</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disposable long-sleeved gowns</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

28. Are the following materials used for cleaning possibly infected surfaces readily available in your health facility? *(Please fill in the table below.)*

<table>
<thead>
<tr>
<th>Equipment</th>
<th>No. of units</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol-impregnated wipes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antiseptic hand cleansers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antiseptic surface cleansers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

29. Does the health facility have an adequate supply of surgical masks for all incoming patients with respiratory symptoms?
   ____ Yes
   ____ No

30. In the event of an increased demand for supplies, is there a contingency plan in place for both government and private sourcing?
   ____ Yes
   ____ No

*If you answered yes, go to question 30a; otherwise, proceed to question 31.*
30a. Who oversees the adequacy of PPE for the entire facility?

_________________

31. Which component(s) of the universal respiratory etiquette strategy is/are strictly enforced in the facility during an epidemic? *(Please check all applicable answers.)*

- [ ] All patients with respiratory illness are provided with surgical masks and given instructions regarding proper use.
- [ ] Hand hygiene materials are present in the evaluation areas, and all patients and staff are encouraged to practice hand hygiene.
- [ ] Patients with respiratory symptoms are segregated from other patients.
- [ ] Health-care personnel use proper protective equipment when evaluating infected patients.
- [ ] In the absence of barriers, health-care personnel maintain a distance of at least one metre from possibly infected patients.
- [ ] Droplet precautions are consistently observed until it is determined with certainty that the patient’s respiratory illness does not require any safety measures beyond standard precautions.

32. Is there an established system for handling soiled linen, patient laundry, and used utensils in the facility?

- [ ] Yes
- [ ] No

33. How are possible cross-infections between health-care personnel, visitors, and infected contacts monitored? *(Please check all applicable answers.)*

- [ ] Vigilant recording of vital signs and telltale symptoms before and after each work shift by all health-care personnel with high-risk exposure.
- [ ] Updated personal diary of contacts for all health-care personnel throughout the duration of the epidemic.
- [ ] Regular medical evaluation for all health-care personnel.
- [ ] Quarantine of all symptomatic health-care personnel.
- [ ] Availability of a venue where health-care personnel with questionable health status can direct their queries and concerns.
- [ ] Registration of all visitors, with full contact details.
- [ ] Others, specify: _____________________________

C. Human Resources Assessment

34. Does the health facility have an Infectious Disease Central Committee that addresses all technical concerns with regard to infection control in the facility during an outbreak?

- [ ] Yes
- [ ] No

*If you answered yes, go to question34a-34c; otherwise, proceed to question 35.*
34a. Who are the members of the committee, and what is the specific role of each member? *(Please fill up the table below)*

<table>
<thead>
<tr>
<th>Member</th>
<th>Department</th>
<th>Specific Role</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

34b. How often do the committee members meet?
Prior to an outbreak ________________________
During an outbreak ________________________

34c. Does the committee enlist the help of outside institutions and experts for technical concerns when necessary?
   _____ Yes
   _____ No

35. Does the health facility conduct training on disease outbreak preparedness for its personnel?
   _____ Yes
   _____ No

*If you answered yes, go to question 35a-35d; otherwise, proceed to question 36.*

35a. Who is/are the intended audience of the training program? *(Please check the most appropriate option.)*
   _____ Medical personnel
   _____ Non-medical personnel
   _____ All personnel who are possibly exposed to infected patients
   _____ Others, specify: ____________________________________________

35b. Is the training program a prerequisite prior to a health worker’s assignment to his/her area of responsibility?
   _____ Yes
   _____ No

35c. How often is the training program given? ________________________

35d. What knowledge items are covered by the training program on disease outbreak preparedness? *(Please check all applicable answers.)*
   _____ Basic and essential knowledge on the infectious disease in question
Major components of the health facility’s formal written plan of action on epidemics

- Standard precautions
- Airborne precautions (including universal respiratory etiquette strategy)
- Others, specify: __________________________________________________________

36. What kind of medical evaluations, if any, are given to health-care personnel in your health facility? (Please check all applicable answers)

- Pre-employment
- Periodic (Please state frequency) ________________
- Post-exposure
- As-needed basis
- None

37. Are vaccines made available for health-care personnel with possible high-risk exposures?

- Yes
- No

If you answered yes, go to question 37a-37b; otherwise, proceed question 38.

37a. Which vaccines are made available for health workers in your health facility? (Please place a check mark in the appropriate space)

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Available, without fee</th>
<th>Available, with fee</th>
<th>Not available</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varicella</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influenza</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polyvalent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetanus Toxoid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis B</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

37b. Are health workers regularly followed-up for appropriate booster doses?

- Yes
- No

38. Does the health facility maintain an updated database of medical records of its health-care personnel?

- Yes
- No

If you answered yes, go to question 38a-38b; otherwise, proceed to question 39.
38a. What information regarding personnel is/are contained within the database? (Please check all applicable answers.)
   _____ Past Medical History
   _____ Immunization Status
   _____ High Risk Exposures
   _____ Post-exposure Prophylaxis
   _____ Work-related injuries
   _____ Others, specify: _____________________________________________

38b. Who has access to personnel health records? (Please check all that apply)
   _____ Health worker in question
   _____ Hospital Director
   _____ Direct Supervisor
   _____ Human Resources Department official
   _____ Health Facility Infectious Disease Central Committee
   _____ Others, specify: _____________________________________________

39. Does the health facility have the capacity to investigate all reports of high risk exposures by health-care personnel?
   _____ Yes
   _____ No

40. Do different departments in the facility coordinate with a central committee in order to facilitate exposure surveillance and post-exposure treatment?
   _____ Yes
   _____ No

41. In the event of an epidemic, are health-care personnel divided into multiple task-independent yet coordinating teams?
   _____ Yes
   _____ No

   *If you answered yes, go to question 41a-41c; otherwise, proceed to question 42.*

   41a. Are high-risk tasks distributed to different teams in order to minimize high-risk exposures for individual personnel?
       _____ Yes
       _____ No

   41b. Does your setup prevent any unnecessary interactions between personnel of various departments with different responsibilities?
       _____ Yes
       _____ No

   41c. Please outline the organization of health-care personnel in your facility during an infectious disease outbreak.
### Personelle Assigned Area Specific Task(s)

<table>
<thead>
<tr>
<th>Team 1</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team</td>
<td>1.</td>
<td>2.</td>
<td>3.</td>
<td>4.</td>
<td>5.</td>
</tr>
<tr>
<td>Team</td>
<td>1.</td>
<td>2.</td>
<td>3.</td>
<td>4.</td>
<td>5.</td>
</tr>
</tbody>
</table>

42. Are health-care personnel discouraged from interacting with workers from other health facilities throughout the duration of an epidemic?
   - Yes
   - No

43. Does the facility temporarily close all shared common areas for personnel (e.g. coffee lounges) during an epidemic as a precautionary measure?
   - Yes
   - No

44. Which of the following groups can your health facility utilize in the event of a staffing shortage during an infectious disease outbreak? (Please check all applicable answers.)
   - Retired health-care personnel previously affiliated with the facility
   - Other personnel in the facility, previously with non-health-related responsibilities
   - Health-care trainees
   - Volunteers
   - Others _______________________________________________________________________

45. What is the average length of each health-care worker’s work day? _______

33a. On average, how many hours during a shift does each worker spend using PPE’s? ________________

46. Does the health facility have the means of communicating with involved government agencies and public information systems during an epidemic?
   - Yes
   - No

47. Is there a Liaison Officer in your health facility who monitors the status of
infectious disease outbreaks in both the facility and the community?
_____ Yes
_____ No

48. Does the health facility ensure that, prior to discharge, every infected patient with resolved symptoms can be adequately followed-up?
_____ Yes
_____ No

III. Assessment of Biological, Chemical, and Radiologic Emergency Preparedness

A. Infrastructure Assessment

49. During a mass casualty incident, does the health facility have the capacity to establish a temporary reception area for incoming patients?
_____ Yes
_____ No

If you answered yes, go to questions 49a-49h; otherwise, proceed to question 50.

49a. Where will the temporary reception area be located? (Please check the most appropriate response.)
_____ Within the existing emergency room
_____ Within the hospital compound, but outside the emergency room
_____ Outside the hospital compound
_____ Others, specify: _______________________________________

49b. How large is the space available for the reception area? (Please state in square meters.) ____________________

49c. Which of the following are present in the reception area? (Please check all applicable answers.)
_____ Arrival point
_____ Triage area
_____ Emergency treatment area
_____ Decontamination area
_____ “Hot Line”
_____ Others, specify: _______________________________________

49d. How far is the temporary reception area from the main treatment facility? (Please state in meters) ____________________

49e. Is the reception area: (Please check one)
_____ Upwind?
_____ Downwind?

49f. How many pathways lead into or out of the reception area? (Please check the most appropriate response)
One: for both ingress and egress

Two: one for ingress, one for egress

Four: separate points of ingress and egress for patients and staff

Others, specify: ____________________________________________

49g. Are pathways and perimeters clearly marked?
- Yes
- No

49h. Do vehicles entering and leaving the site have their own point of access?
- Yes
- No

50. Does the health facility have pre-arranged formal agreements with other facilities in the community that cover transfer procedures in the event that the hospital can no longer accommodate the influx of patients?
- Yes (Please fill in the table below)
- No

<table>
<thead>
<tr>
<th>Health Facility</th>
<th>Contact Number</th>
<th>Liaison Officer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

51. Do patients going through the reception area get triaged to the proper level of care according to their particular needs?
- Yes
- No

52. What procedures are expected to be performed in the emergency treatment area? (Please check all applicable answers.)
- Venoclisis
- Loading IV therapy
- Minor Suturing
- Resuscitation
- Repair of any defects in protective garments
- Initial decontamination
- Others, specify: ____________________________________________

53. How far is the decontamination area from the main treatment facility? (Please state in meters.) _________________

54. Is the decontamination area downwind in relation to the main treatment facility?
- Yes
- No
55. Is the decontamination area upwind from the arrival point and triage area?
   _____ Yes
   _____ No

56. Can the location of the decontamination area be easily transferred according to prevailing winds at any given moment?
   _____ Yes
   _____ No

57. Is the decontamination site big enough that a distance of 75 meters can be maintained between decontamination facilities and any contaminated areas?
   _____ Yes
   _____ No

58. Can the perimeter of the reception area be adequately secured against possible external attack?
   _____ Yes
   _____ No

59. Is the main treatment facility accessible by any other route that bypasses the temporary reception area?
   _____ Yes
   _____ No

60. Which of the following decontamination methods can your health facility employ during a mass casualty incident? (Please check all applicable answers.)
   _____ Physical decontamination
   _____ Flushing with water and aqueous solutions
   _____ Adsorbent materials (Please specify) __________________________
   _____ M291 (Polystyrene Polymeric + ion exchange resins)
   _____ Others, specify: ____________________________________________
   _____ Chemical decontamination
   _____ Soap wash
   _____ Hypochlorite solutions
   _____ Neutralizing agents (Please specify) __________________________
   _____ Others, specify: ____________________________________________

61. Is there an alternative water source that the hospital can use for decontamination in order to supplement the present water supply during a sudden increase in demand?
   _____ Yes (Please specify) __________________________________________
   _____ No

62. Does the health facility have a contingency plan in place for quickly replenishing its stock of decontamination solutions during a mass casualty incident?
   _____ Yes
   _____ No
63. Are there skilled technicians in the health facility who can conduct rapid radiologic surveys of incoming patients and the facility itself in order to detect possibly harmful radiologic contamination?
   ____ Yes
   ____ No

64. In the event of a radiologic incident, does the health facility have the means to handle contaminated casualties and equipment in accordance with accepted guidelines?
   ____ Yes
   ____ No

65. Does the health facility have adequate stocks of the following essential supplies needed during a radiologic emergency? (Please check all that apply and indicate the number of units in the parenthesis after each blank).
   ____ ( ) Intravenous therapy
   ____ ( ) Intravenous fluids
   ____ ( ) Anti-diarrheals
   ____ ( ) Anti-emetics
   ____ ( ) Potassium iodide

66. Are germicidal cleaning agents readily available in your health facility?
   ____ Yes
   ____ No

67. Does your health facility have an efficient system for sterilizing all reusable equipment?
   ____ Yes
   ____ No

68. Does the health facility comply with accepted guidelines for disposal of contaminated single-use equipment?
   ____ Yes
   ____ No

69. Does your health facility have the necessary instruments to check for possible radiologic contamination in patients, health care workers, and equipment?
   ____ Yes
   ____ No

If you answered yes, go to questions 69a-69c; otherwise, proceed to question 70.

69a. Which radiation measurement device(s) is/are available in your health facility? (Please check all that apply, and indicate the number of units within the parentheses after each blank)
   ____ ( ) Thermoluminiscent dosimeters
   ____ ( ) Self-reading dosimeters
   ____ ( ) Dosimeter cards
69b. Does the health facility have skilled personnel who can operate the instruments?
   ____ Yes
   How many? __________
   ____ No

69c. Are the instruments checked and calibrated periodically while not in use?
   ____ Yes
   ____ No

B. Functional Assessment

70. Does your health facility have an existing system of monitoring all patient areas for signs of possible disease outbreak or bioterrorist attack?
   ____ Yes
   ____ No

   *If you answered yes, go to questions 70a-70c; otherwise, proceed to question 71.*

70a. Who are the key participants in the facility’s infectious disease surveillance system? (Please check all applicable answers)
   ____ Infectious disease control professional / committee
   ____ Chief Nurse
   ____ Attending Physicians
   ____ Staff Nurses
   ____ Others, specify: ________________________________

70b. Are the medical records of new patients with telltale signs and symptoms of a possible biologic incident immediately put on review?
   ____ Yes
   ____ No

70c. Does the facility observe close coordination with the local health department for early detection and / or reporting of possible intentional biologic incidents?
   ____ Yes
   ____ No
71. Does the community where your health facility is located have an existing mass casualty emergency preparedness plan?
   _____ Yes
   _____ No

*If you answered yes to question 71, answer questions 71a-71d.*

71a. When was the plan formulated? __________

71b. Was the health facility involved in the formulation of the plan?
   _____ Yes
   _____ No

71c. When was the plan last updated? __________

71d. Does the health facility have a representative in the committee that oversees the periodic review of the emergency plan?
   _____ Yes (Please specify the name of the representative.)
   __________________________________________________________
   _____ No

*If you answered no to question 71, answer question 71e.*

71e. Does the health facility have a representative in the community’s health committee who can facilitate the formulation of a mass casualty emergency preparedness plan?
   _____ Yes (Please specify the name of the representative.)
   __________________________________________________________
   _____ No

72. Does your facility participate in community-wide emergency drills?
   _____ Yes
   _____ No

73. In the event of a mass casualty incident secondary to biologic, chemical, or radiologic agents, what subset of patients can your facility accommodate?
   *(Please check the most applicable response.)*
   _____ Exposed patients only
   _____ Unexposed patients only
   _____ Both exposed and unexposed patients
   _____ The subset of patients has not been determined in the hospital’s emergency plan
74. Which communication devices can the health facility utilize during a mass casualty incident? *(Please fill in the table below.)*

<table>
<thead>
<tr>
<th>Communication Device</th>
<th>Number of Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular telephones</td>
<td></td>
</tr>
<tr>
<td>Cellular phones</td>
<td></td>
</tr>
<tr>
<td>Fax machines</td>
<td></td>
</tr>
<tr>
<td>Short wave radios</td>
<td></td>
</tr>
<tr>
<td>Internet consoles</td>
<td></td>
</tr>
</tbody>
</table>

75. Are there back-up communication systems in place?
   - Yes *(Please specify)*
   - No

76. Does the health facility have an assigned representative who coordinates with the press and media during a mass casualty incident?
   - Yes *(Please specify the name of the representative.)*
   - No

C. Human Resources Assessment

77. In addition to the standard PPE enumerated in the previous section of the manual, are the following items readily available in your health facility? *(Please fill up the table below.)*

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Number of Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disposable shoe coverings</td>
<td></td>
</tr>
<tr>
<td>Standard issue chemical protective masks</td>
<td></td>
</tr>
<tr>
<td>Standard issue MOPP-4 suits</td>
<td></td>
</tr>
<tr>
<td>Rubber gloves</td>
<td></td>
</tr>
<tr>
<td>Rubber aprons</td>
<td></td>
</tr>
</tbody>
</table>

78. Which of the following materials are readily available for use by the facility’s health-care workers? *(Please check all applicable answers.)*
   - Plastic wrap
   - Plastic bags
   - Plain paper for the floors
   - Personal dosimeters for heavily exposed personnel
   - Others, specify: ______________________
79. Are the health care workers in the facility required to wear photo identification cards while on duty?
   _____ Yes
   _____ No

80. Can the health facility rapidly issue standard identification cards to reserve staff and volunteers during a mass casualty incident?
   _____ Yes
   _____ No

81. During mass casualty incidents, does the health facility allow physicians who are not regular members of its medical staff to admit and attend to victims?
   _____ Yes
   _____ No

82. Does the health facility have a contingency plan for maximizing and augmenting its work force during a mass casualty incident?
   _____ Yes
   _____ No

83. Does the health facility provide regular training regarding biological, chemical, and radiologic incidents for its health care workers?
   _____ Yes
   _____ No

   *If you answered yes, go to question 83a; otherwise, proceed to question 84.*

83a. What components are included in the training program? *(Please check all applicable answers.)*
   _____ Universal Precautions
   _____ Health Facility Emergency Plan
   _____ Decontamination Procedures
   _____ Specific roles during a mass casualty incident
   _____ Maintenance of physical and psychological well-being during a mass casualty incident
   _____ Others, specify: _______________________________________

84. Does the health facility conduct regular emergency preparedness drills?
   _____ Yes
   _____ No

   *If you answered yes, go to questions 84a-84b; otherwise, proceed to question 85.*

84a. How frequent does the facility hold drills? ________________

84b. Is the health facility’s emergency plan modified according to the results of drills?
   _____ Yes
   _____ No
Part II Assessment of General Emergency Preparedness

I. General Information

This section deals with basic facts about the health facility that should be known to pertinent personnel. Aspects covered include the capacity, inventory of some basic furnishings, and history of the facility’s past experiences with internal and external disaster situations. All of these are important in giving a general overview of the facility’s ability to withstand catastrophic events and provide services to disaster victims.

When a building is constructed, it is designed to last for a certain number of years. This is the proposed ‘useful life of a building’ and is agreed upon by the building owner and contractor.

Most of the time, a building outlasts its projected useful life. If so, it may be prudent to have professionals evaluate the structural integrity of the building.

1. When was the health facility built? __________

2. What is the bed capacity? __________

3. How many operating rooms does your facility have?
   _____ 1
   _____ 2
   _____ 3
   _____ > 3, specify: __________

4. How many stretchers (used for transporting patients) does the facility have? __________

5. Where are the stretchers placed when not being used? (Please check all applicable areas.)
   _____ ER
   _____ Waiting area
   _____ Ward area
   _____ Storage room
   _____ Lobby
   _____ Others, specify: __________

6. How many wheelchairs does the facility have? __________

7. Where are wheelchairs placed when not in use? (Please check all applicable areas.)
   _____ Nurses’ station
   _____ Ward area
8. Where are the carts, used for transporting and storing medical supplies, located? (Place the number of carts found in all the applicable areas.)

<table>
<thead>
<tr>
<th>No. of carts</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. nurses’ station of each ward</td>
</tr>
<tr>
<td>b. emergency department</td>
</tr>
<tr>
<td>c. OPD section</td>
</tr>
<tr>
<td>d. treatment room</td>
</tr>
<tr>
<td>e. physiotherapy/ exercise room</td>
</tr>
<tr>
<td>f. operating room</td>
</tr>
<tr>
<td>g. other areas, specify:</td>
</tr>
</tbody>
</table>

Stretchers, wheelchairs, and carts are means of intra-hospital transportation. Stretchers and wheelchairs would be used in case there is a need to transfer the patients to other parts of the health facility or outside in case of evacuation. Carts are used to convey special equipment and supplies.

Proper inventory of these items, together with identification of their location, is vital to maximize their use in times of emergency. Preferably, the stretchers and wheelchairs should be located near the nurses’ station so that nurses can distribute them promptly. Carts should be located in all patient care areas. The objects they contain should be fastened to shelf walls to avoid accidental damage.⁸

9. Are there extra beds in the facility?
   _____ Yes
   _____ No

   If you answered yes, please proceed to questions 9a-9b; otherwise go to question 10.

9a. Where are they located? (Please check all applicable areas.)
   _____ Rooms
   _____ Receiving areas
   _____ Stock rooms
   _____ In-patient areas
   _____ Visiting rooms
   _____ Others, specify: ___________

---

9b. Are the beds secured in place?

____ Yes
____ No

*If you answered yes, please proceed to question 9c; otherwise go to question 10.*

9c. If yes, how? *(Please check all applicable methods.)*

____ Wheel lock
____ Manually fastened
____ With metal
____ With wood
____ With rope
____ Others, specify: ___________________________

The availability of extra beds is important during disaster situations when there is a strong possibility of patient overflow.

Beds should be secured to protect patients during earthquakes. The location of extra beds should be identified to maximize their use during emergency situations. ⁹

10. Has the health facility experienced any form of disaster during the last 10 years?

____ Yes
____ No

*If you answered yes, please proceed to questions 10a-10c; otherwise go to question 11.*

10a. What is the nature of the disaster? *(Please check all applicable answers.)*

____ Earthquake
____ Landslide
____ Tsunami
____ Typhoon
____ Fire
____ Volcanic Eruption
____ Flood
____ Explosion (caused by bombs, fuel tanks, etc.)
____ Armed conflict
____ Industrial/Technological
____ Infectious Disease Outbreak
____ Radiologic/Chemical
____ Others, specify: ___________________________

10b. Was evaluation of the structural integrity of the building done after the disaster?
   _____ Yes
   _____ No

10c. Has the facility suffered any structural damage due to the said disaster?
   _____ Yes
   _____ No

*If you answered yes, please fill in the table below; otherwise go to question 11.*

<table>
<thead>
<tr>
<th>Nature of disaster</th>
<th>Date of Occurrence</th>
<th>Structural Damage</th>
<th>Repairs Done</th>
<th>Cost of Repairs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

11. Has the facility responded to an external disaster situation in the past?
   _____ Yes
   _____ No

*If you answered yes, please fill in the table below; otherwise proceed to the box after the table.*

<table>
<thead>
<tr>
<th>Nature of Disaster</th>
<th>Date of Occurrence</th>
<th>Total Number of Casualties</th>
<th>Number of Casualties Treated by the Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

In most developing countries funding for hospitals is limited, making it difficult to divert funds to prepare for all potential disasters. Because of this, it may be efficacious to review the hospital’s past experience and response to disasters. 10

Capable engineers must perform an evaluation of the structural integrity of the hospital building/s after a disaster. Some defects may not be obvious...
so referral must not be made only if glaring structural damage was found. Previous structural damage would indicate which part/s of the hospital design was/were vulnerable and thus serve as a guide for future construction. A review of damage repair costs resulting from a disaster may prove that disaster preparedness activities are more cost-effective in the long run.

II. Assessment of Structural Vulnerability

Various requirements and regulations are imposed on the construction of health care facilities in different countries, especially regarding fire and earthquake resistance. In some cases, however, there is lack of compliance owing to certain limitations, such as use of substandard materials due to financial constraints or selection of an inappropriate site for the hospital due to unavailability of land. If disaster strikes this can lead to a tragic outcome.

12. Where is the health facility located? (Please check the appropriate answer/s.)
   ____ On a slope
   ____ On a valley
   ____ On top/close to active faults
   ____ On a plain/flat land
   ____ On a flood plain
   ____ In a tsunami prone area
   ____ On a highly elevated area
   ____ Others, specify: ______________

The terrain where the health facility is located provides valuable clues as to:
1. The nature of the disaster that may be expected (e.g. flood in an area which is located in a valley); and/or
2. Other potential dangers from disasters (e.g. landslides in slopes during typhoons).

A plain or flat terrain is the best site for a health facility\textsuperscript{11}

\textbf{Figure 1.} Building located on flat terrain

\textsuperscript{11} WHO, \textit{District Health Facilities}, p. 20.
Identification of the location and any relevant hazards should prompt a professional referral (e.g. to engineers) to ensure proper measures are taken to minimize damage to structures. Examples of the measures that may be taken are:

1. Provision of storm-water drains in areas prone to flooding;
2. Substitution of a heavy tile roof, which is more susceptible to movement during an earthquake, by a lighter and safer roof; and
3. Reinforcement and strengthening of walls by covering their surfaces with wire mesh and filling with cement.\(^{13}\)

13. How many buildings does the institution have?

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;<strong>3</strong>, specify:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14. Is/Are the shape/s of the building/s symmetrical\(^{14}\)?

<table>
<thead>
<tr>
<th>Building</th>
<th>Symmetry</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

15. Is/Are the shape/s of the building/s simple or complex\(^{15}\)?

<table>
<thead>
<tr>
<th>Building</th>
<th>Shape</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Simple</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^{12}\) Figure 1 and Figure 2 were adapted from WHO, *District Health Facilities: Guidelines for Development and Operations*, 1998, p. 20.

\(^{13}\) PAHO, *Mitigation of Disasters*, Volume 3, pp. 54-55.

\(^{14}\) Please see Figure 3.

\(^{15}\) Please see Figure 4.
The symmetry and shape of a building may play important roles in its behavior when subjected to stress such as that produced by an earthquake. Symmetry is defined as the ‘correspondence in size, shape, and relative position of parts that are on opposite sides of a dividing line\(^\text{16}\). Examples of symmetry in structures are illustrated below.

![Symmetrical and non-symmetrical structures](image)

**Figure 3.** Symmetrical and non-symmetrical structures

The shape of a building may be simple or complex as shown in Figure 4. The most stable structures are those with simple shapes that are symmetrical in both the lateral and longitudinal axes, such as a square or rectangular structure.

![Simple and complex shapes](image)

**FIGURE 4.** Examples of simple and complex building shapes

---

16. How many stories do the buildings of the institution have? *(Please fill in the table below.)*

<table>
<thead>
<tr>
<th>Building</th>
<th>No. of stories</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

During the 1988 earthquake in Armenia, people inside buildings with five or more floors were 3.65 times more likely to be injured compared to those inside buildings with less than five floors. During the 1990 Philippine earthquake, people inside buildings with seven or more floors were 34.7 times more likely to be injured. This is because during an earthquake, multi-story buildings become unstable due to the magnification of seismic forces on higher floors, leading to a greater probability of structural collapse. Another factor is the longer time needed by occupants of high-rise buildings to evacuate, which increases their chances of being trapped if the building collapses.

17. What is/are the angle/s of the roof/s on the health facility building/s? *(Please fill up the table below.)*

<table>
<thead>
<tr>
<th>Building</th>
<th>Roof Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1° - &lt;10°</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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The roof angle is the angle made by one side of a roof against the horizontal.

For buildings located in an area which is prone to cyclones and/or may be affected by ashfall from a volcanic eruption (up to about 80 km or 50 miles, as observed in the eruption of Mt. St. Helens in Washington State), consideration must be given to the angle of roofs. During the Mt. Pinatubo eruption in 1991, at least 300 people died in buildings whose roofs collapsed under the weight of ash. It was also found that buildings that are wider than they are tall (such as churches and halls) are 5 times more likely to collapse than residential buildings. Ash build-up approaches a dangerous level at a depth of approximately 25 cm. However, in the case of Mt. Pinatubo, whose eruption was accompanied by rainfall, even roofs which accumulated only 10 cm collapsed under the weight of ash compacted and made heavier by rainwater.¹⁹

In particularly large eruptions, 25 cm deep ashfall may easily accumulate in one hour, allowing insufficient time to sweep it away.²⁰ In this case, more acutely-angled roofs would be beneficial as most of the ash will slide off.

For buildings located in cyclone-prone area, studies show that a roof angle of 30°-40° is optimum for withstanding wind forces.²¹

18. Are ramps present in appropriate areas of the health facility for moving bed patients and for use by people with disabilities?
   ____ Yes
   ____ No

   Proper structures to provide access to persons with limited mobility must be in place. Ramps must be located in proper places for transporting patients on beds and wheelchairs. Failure to do so may compromise the safety of these people especially if the health facility must be evacuated.

---

²⁰ Baxter, p. 189.
19. What is the main material used in the construction of the buildings?
   ____ Reinforced concrete
   ____ Brick masonry
   ____ Wood
   ____ Others, specify: ______________

Construction materials have varying **yield points**. This is the point at which a material breaks apart in response to the force/s applied to it. Wood is considered to have a low yield point compared to the other usual building materials, since it is easily deformed and broken apart by smaller forces.\(^{22}\) However, wood-frame buildings have been proven to be among the safest structures during an earthquake because even if they do collapse, their potential to cause injury is considerably less than stone buildings. Un-reinforced masonry buildings, such as structures made from adobe, have heavy walls and heavy roofs that are prone to collapse. Greater injury can be expected from accidents involving these structures. Concrete-frame structures are less likely to collapse, but when they do, they are considerably more lethal due to the weight of the materials used.\(^{23}\)

Reinforced concrete and steel are the recommended building materials, but they require sophisticated construction techniques. In the absence of adequate technical competence or proper building inspection and control, the use of these materials can result in catastrophic failures.\(^{24}\)

20. Were there any major alterations done in any of the buildings of the health facility?
   ____ Yes
   ____ No

*If you answered yes, please fill in the table below; otherwise proceed to the box after the table.*

<table>
<thead>
<tr>
<th>Building</th>
<th>Alteration done</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

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\(^{24}\) Noji, *Earthquakes*, p. 152.
Alteration and/or remodeling done within the hospital in an attempt to create new spaces or install new structures or equipment without considering the effect these alterations could have on the general strength of the structure may become a liability rather than an improvement. There have been cases in which the structural walls that were part of the original seismic-resistant design of a building were broken in order to install air-conditioning units. These alterations might have been done afterwards when the original design engineers were no longer associated with the construction. Even small openings for window-type air conditioners made through an important load-bearing wall may spell disaster. The results of such breaches is a weakening of structural walls that may result in failure or partial collapse during an earthquake, even if the initial design were seismic-resistant.  

Building alterations require proper consultation with engineers and a review of the original plan of the building.

III. Assessment of Non-Structural Vulnerability

Non-structural elements of a building include ceilings, windows, doors, as well as mechanical, electrical, and plumbing equipment and installations. For health facilities, attention needs to be paid to these non-structural elements, particularly medical equipment, since these are necessary to its operations. Too much damage to a health facility’s non-structural elements can cause its functional collapse and even lead to structural damage of buildings and physical injury to patients and personnel.  

21. Which of the following are available in your institution? (Please fill in the table below.)

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Present in the hospital?</th>
<th>No. of units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central air conditioning unit</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Electric generators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X-ray equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boiler</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CT-Scan machine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrotherapy pool</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRI Machine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respirators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anesthesia machine</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

22. Where are the following located? (Please put the number of units in the appropriate spaces.)

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Building location</th>
<th>Basement</th>
<th>Ground Floor</th>
<th>Second Floor</th>
<th>Third Floor</th>
<th>Above 3rd Floor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Air-Con Unit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X-ray Equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CT Scan Machine</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>MRI Machine</td>
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<tr>
<td>Electric Generator</td>
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<tr>
<td>Boiler</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Hydrotherapy Pool</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respirator</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Anesthesia Machine</td>
<td></td>
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</tr>
</tbody>
</table>

23. How are the following anchored? (Please check all appropriate spaces.)

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Anchorage</th>
<th>Material</th>
<th>Location of Anchorage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Attached to wall</td>
<td>Not anchored</td>
<td>Use of metal</td>
</tr>
<tr>
<td>Central Air Conditioning Unit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X-ray Equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CT Scan Machine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRI Machine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric Generators</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boilers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrotherapy Pools</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respirators</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suction Machines</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrigerator/Freezer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Television Sets</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The presence of heavy equipment on a particular floor of a building alters its response to movements (e.g., earthquakes). Placement of heavy machinery on upper floors concentrates more of the total mass of the building at that point. This is worsened by the fact that the higher the floor is, the greater the increase in seismic response accelerations, thus creating a higher possibility of collapse. Moreover, if the presence of this heavy equipment were not taken into account by the original building design, the structural response of the building to ground movement may be altered. The additional load may produce stress on ceilings and floors which can then result in catastrophic failures.

27 PAHO, Mitigation of Disasters, Volume 3, p. 41.
28 PAHO, Mitigation of Disasters, Volume 3, p. 48.
A piece of heavy equipment should be firmly anchored to a structural element of a building or its foundation. If not, it may slide, overturn, or move in such a way that it can cause structural damage or physical injury to hospital personnel/patients. The heavier an object is, the more likely it is to move due to the force of inertia. Some furniture, if not properly anchored, may cause similar damage. Especially worthy of mention are the television sets which are sometimes placed on high brackets near the patients’ beds and in waiting rooms.²⁹

The simplest and most effective solution is to fasten the lower and upper parts of the equipment against a firm wall or some other support using metal strips.

24. Where do you store chemicals? (Please check all applicable answers.)
   _____ Storage with shelves
   _____ Storage without shelves
   _____ On top of cabinets
   _____ On the floor
   _____ Others, specify: ____________________________

25. Where do you store other potentially hazardous substances? (Please check all applicable answers.)
   _____ Storage with shelves
   _____ Storage without shelves
   _____ On top of cabinets
   _____ On the floor
   _____ Others, specify: ____________________________

26. Are these storage containers anchored?
   _____ Yes
   _____ No

   If you answered yes, please proceed to question 26a; otherwise go to question 27.

26a. How are these storage containers anchored?
   _____ At the base
   _____ At the sides
   _____ On top
   _____ All of the above

27. Who is/are responsible for storage and safekeeping of these chemicals and substances?
   _____ Laboratory technician
   _____ Utility personnel
   _____ Others, specify: ____________________________

²⁹ PAHO, Mitigation of Disasters, Volume 3, p. 54.
28. Did the personnel in charge handling and storing chemicals and potentially hazardous substances receive proper training regarding his/her tasks?
   _____ Yes
   _____ No

29. Are guidelines set by Material Safety Data Sheets (MSDS) being followed with regard the storage, handling, and disposal of these chemicals and substances?
   _____ Yes
   _____ No

Chemicals and other potentially hazardous substances may cause injury by virtue of their inherent toxicity or by the possible subsequent reactions that may arise (e.g. fire). This may result from improper storage, handling, and/or disposal of these substances. Thus, it is recommended that personnel in charge of these substances be properly trained and that safety guidelines specific to each substance be followed.

In storing chemicals and other substances, proper arrangement and grouping must be followed. The type of chemical determines how, and with what, other chemicals it should be stored.

The storage containers of these chemicals and substances should be put directly on the floor with proper labels, manufacturer’s warning, and appropriate instructions on what to do in case of accidental contact with these substances.

If placement in storage shelves cannot be avoided due to space constraints, it may be wise to do either one of the following:
1. Put railings in front of each shelf to avoid overturning the individual containers on the shelf; or,
2. Fasten each individual container against the storage shelf wall using Velcro.\(^{30}\)

Material Safety Data Sheets (MSDS) are official documents that are used to disseminate important chemical safety information to involved workers, emergency responders, and the general public. The use of MSDS has gained widespread support among most countries. However, the varying cultural, historical, and political processes in each country preclude the formulation of a truly international form of MSDS. Moreover, the role of MSDS in the local regulatory scheme differs in each country.

Typically, MSDS contain the following information about chemicals:

- Chemical and physical properties
- Spill and disposal procedures
- Health hazards
- Emergency care and first aid
- Storage and handling
- Personal protection
- Reactivity
- Environmental and registration data

---

IV. Assessment of Functional Vulnerability

After assessing the structural and non-structural soundness of the institution, the next step is to ensure that health services will keep running to meet the demands of the community at a time when these are most needed. This section deals with assessment of the functional vulnerability of the health facility and encompasses several aspects. The first deals with the general physical layout of the facility including its location, accessibility, and the distribution of areas within the facility. Secondly, there is the consideration of the individual services, both medical (equipment and supplies) and non-medical (utilities, transportation and communication), that are vital to the continuous operation of the facility. The third aspect examines the public services and safety measures available inside the facility.

A. Site and Accessibility

30. Is the health facility located in the town/city proper?
   _____ Yes
   _____ No
   
   If you answered no, please proceed to questions 30a-30b; otherwise go to the box after question 30b.

30a. How far is the facility from the main town/city? _________________

30b. Is the facility separated from the main town/city by a bridge?
   _____ Yes
   _____ No

To ensure accessibility for patients the health facility should be near good roads and adequate means of transportation. It should also be close to other institutional facilities such as educational, religious and commercial centres.32

A bridge separating the health facility from a main town/city is a disadvantage, especially if that route is the only one that leads to and from the main town/city. If the bridge were affected by flood, earthquake or man-made catastrophe, the facility would be isolated from people seeking help.

31. Is the health facility located along the main street/highway?
   _____ Yes
   _____ No
   
   If you answered no, please proceed to question number 31a; otherwise go to question 32.

32 WHO, District Health Facilities, p. 19.
31a. How far is the facility from the main street/highway? ______________

32. How many roads lead to the health facility?
   _____ 1
   _____ 2
   _____ 3
   _____ >3, specify: __________

33. What are the conditions of roads leading to the health facility? (Please fill in the table below.)

<table>
<thead>
<tr>
<th>Road</th>
<th>No. of lanes</th>
<th>Road Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Well paved, no potholes</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Standards specify that a health facility be located near a major roadway that connects developing areas of the city/town and, in some cases, some other municipalities.\(^{33}\)

In case one route is blocked, it is important that there be a functional alternative route leading to the facility. In the event of disaster, these routes may be used to the facility’s advantage by establishing clear access and evacuation routes, facilitating fluid traffic movement.

Well-paved roads, wide enough to accommodate at least two ambulances at the same time, provide better flow of traffic.

B. Areas in the Health Facility

34. What are the major areas of your institution? (Please check all applicable answers.)
   _____ Administration
   _____ Ambulatory Care Units (Outpatient)
   _____ General Services
   _____ Emergency Services
   _____ In-patient Care Units
   _____ Laboratory
   _____ Pharmacy
   _____ Radiology
   _____ Operating Rooms
   _____ Others, specify: ______________

\(^{33}\) PAHO, Mitigation of Disasters, Volume 3, p. 24.
Proper zoning of various areas of the health facility, with regard to the inter-relationships between them, helps maintain an adequate level of operation during normal conditions as well as with an influx of a large number of patients.34

The facility’s design should be kept simple to allow users to find their way around without difficulty. Some principles for the designation of different units are as follows:

1. Departments most closely linked to the community are best located nearest to the entrance. These include the outpatient service, emergency room, administration, and primary health care support (PHC).
2. Departments that receive their workload from above should be next closest to the entrance: radiology, laboratories.
3. In-patient departments should be in the interior zones or wards.35

Figure 5. Diagram showing an example of proper zoning of health facilities.36

34 WHO, District Health Facilities, p. 46.
35 WHO, District Health Facilities, p. 47.
35. Where are the points of entry of the health facility? *(Please check all the applicable answers.)*

- ER area
- Administration area
- OPD area
- Others, specify: ______________

During disaster situations, some points of entry may have to be closed off to limit and control the number of people entering the facility. This avoids unnecessary overcrowding, prevents the curious from wandering in and out, and protects personnel from external hostile forces.

36. What is within the General Services area? *(Please check all applicable answers.)*

- Boilers
- Kitchen area
- Laundry area
- Communications
- Machinery area
- Storeroom
- Others, specify: ______________

37. Is the General Services area located in a separate building?

- Yes
- No

The General Services area includes services vital for the continuous operation of the health facility. In the past, mistakes made in planning this sector, such as failing to take into consideration the explosive and flammable nature of boilers, fuels and gases, have proven costly.  

It is recommended that the General Services area be located in a separate structure to house its various components including: power plant, boilers, water storage facilities, kitchen, laundry area, and communications centre.

38. What specific areas of the health facility can be converted into spaces for patients during disaster situations? *(Please check all the applicable answers.)*

- Waiting areas/lobby
- Physician’s offices
- Parking lots
- Physiotherapy room
- Park/ free area
- Outpatient consultation

---

Diagnostic and treatment room

Others, specify: ________________________________

39. What provisions are located in these areas? (Please check all applicable answers.)

- Adequate lighting
- Electrical outlets
- Water supply
- Bathroom
- Telephone outlets
- None

The health facility should identify areas that can be converted into spaces for patients in the event of an influx of patients beyond the bed capacity of the facility or in case of evacuation of a floor or building. These areas must have basic utilities to remain functional. As much as possible, the use of hallways this purpose must be avoided since this impedes the flow of patients, personnel, and services.

C. Equipment and Supplies

40. Are the following equipment/supplies available in your institution? (Please fill in the table below.)

<table>
<thead>
<tr>
<th>Equipment/Supply</th>
<th>No. of units available</th>
<th>Functional</th>
<th>Properly labeled</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Stethoscope, adult</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Stethoscope, pediatric</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Sphygmomanometer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Thermometer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Tongue depressors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Light source (flashlight)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Tape measure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. Vision testing chart (Snellen)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Reflex hammer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>j. Head mirror</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>k. Mirror, laryngeal set</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>l. Otoscope set</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m. Pelvimeter (Collyer, external)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n. Speculum, nasal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>o. Scale, spring/infant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p. Scale, adult</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>q. Ambu-bags (infant, child, adult with masks)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r. Laryngoscope</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>s. Suction Machine</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
t. Oropharyngeal airway
u. Endotracheal tubes with cuffs
v. Intubating forceps
w. Endotracheal tube connectors
x. Examination table

The materials included in the table above are adapted from a list of basic equipment that is recommended by the World Health Organization for a Rural Health Unit in the Western Pacific Region.  

This list should only be used as a guide for the development of a health facility’s set of emergency equipment according to local health needs. Ideally, at least one set should be available per ward or treatment area.

It is recommended that a system be set up for regular inventory of these items to ensure that management of patients will not be delayed by the absence of diagnostic and therapeutic tools. It is also imperative that they be periodically checked as to function to be sure that they are ready for use during emergency situations. The importance of these preparations is crucial during disaster situations when a large number of victims may have to be treated.

Proper labeling of equipment is particularly important if the facility depends on volunteers, who are unfamiliar with medical equipment.

41. Are there stocks of the necessary supplies and equipment in the health facility?
   _____ Yes
   _____ No

42. Is inventory of resources done by the institution?
   _____ Yes
   _____ No

   If you answered yes, please proceed to questions 42a-42b; otherwise go to question 43.

42a. How often is the inventory conducted?
    _____ Every month
    _____ Quarterly
    _____ Annually
    _____ Others, specify: _______________

42b. What benefits have been realized from this practice? (Please check all applicable answers.)

43. Is there a detailed list showing the destination (intended use) of these supplies?
   ____ Yes
   ____ No

In any health facility, systems should be in place for estimating drug requirements, maintaining an inventory, storing and stocking drugs, and issuing and controlling the use of drugs. If this is not done, an inadvertent shortage of essential supplies may occur due to poor procurement procedures, and/or wastage of valuable supplies that exceed their expiration dates. Inventory control is a vital part of managing and using available resources.39

Necessary supplies should be stockpiled in advance. Detailed lists showing the destination of these supplies should be drawn up in the preparation phase of the disaster plan.40

44. How many months of supplies (medical and surgical items, essential medicines and other supplies) are stocked for use by the health facility?
   ____ 1 month
   ____ 2 months
   ____ 3 months
   ____ >3 months, specify: ______________

45. Is there an arrangement with vendors regarding procurement of supplies and equipment during a disaster?
   ____ Yes
   ____ No

46. Does the health facility have a system in place for emergency procurement of supplies?
   ____ Yes
   ____ No

   If you answered yes, please proceed to question 46a; otherwise go to question 47.

46a. How long does the procurement of supplies take under emergency conditions?
   ____ 1 week

2 weeks
3 weeks
Others, specify: ____________________

47. Is there an arrangement for sharing of resources with other health facilities and/or potential emergency suppliers of resources?
   Yes
   No

The recommended amount of supplies on stock depends on the assessed needs of the health facility and the purchasing interval, i.e. the time between ordering and delivery of supplies, which is commonly about three to six months. However, during a disaster, the facility’s regular purchasing cycle can no longer be expected to fulfill the increased demand for supplies. Special arrangements should be made with vendors in anticipation of disasters.

It is important to devise a system for emergency procurement of supplies, otherwise, proper treatment of patients might be compromised. This may be done by setting aside a particular percentage of the budget for emergency procurements, bypassing the usual bureaucratic procedures. If this is not possible, it may be necessary to coordinate with nearby health facilities to arrange for sharing of resources during disaster situations. An organized community-wide disaster response, as a result of close coordination, would ensure that all available community resources would be utilized with maximum efficiency.

48. Is rotation of items with expiry dates done?
   Yes
   No

To avoid needlessly wasting supplies, it is essential to ensure rotation of items with expiry dates by using items that will expire first while placing in stock those with later expiration dates.

49. Who coordinates resource allocation? (Please check all the applicable answers.)
   Staff of emergency controller
   Administrative staff
   Volunteers
   Others, specify: ____________________

41 WHO, District Health Facilities, p. 168.
42 An emergency controller is a member of the emergency planning group who is assigned the responsibility of controlling and coordinating the entire emergency response.
During emergency situations, a member of the staff of the emergency controller should coordinate allocation of resources. Unusual resource purchases and allocations should be recorded for later analysis and reconciliation.\textsuperscript{43}

50. Does your health facility have an emergency kit?

\begin{itemize}
  \item [\textbf{\textit{\hspace{1cm}Yes}}] Yes
  \item [\textbf{\textit{\hspace{1cm}No}}] No
\end{itemize}

\textit{If you answered yes, please proceed to questions 50a-50b; otherwise proceed to the box after 50b.}

50a. Are the contents of your emergency kit consistent with the WHO’s prescribed \textit{New Emergency Health Kit}?

\begin{itemize}
  \item [\textbf{\textit{\hspace{1cm}Yes}}] Yes
  \item [\textbf{\textit{\hspace{1cm}No}}] No
\end{itemize}

50b. Are the following medicines included in your emergency kit?

\begin{table}[h]
\centering
\begin{tabular}{|l|c|c|}
\hline
\textbf{MEDICINE} & \textbf{Yes} & \textbf{No} \\
\hline
\textbf{Anesthetics} & & \\
Ketamine, 50mg/ml in 10-ml vial (as hydrochloride), for injection & & \\
Thiopental, 1 g (sodium salt), powder for injection & & \\
Lidocaine & 1% (as hydrochloride), for injection & 5% with 7.5% glucose solution for spinal in 2-ml ampoule anesthesia & \\
Bupivacaine, 0.5% (as hydrochloride), for injection & & \\
\textbf{Pre-operative medication} & & \\
Atropine, 1 mg/ml (as sulfate), for injection & & \\
Diazepam, 5 mg/ml in 2-ml ampoule, for injection & & \\
\textbf{Analgesics, Antipyretics, NSAIDS} & & \\
Acetylsalicylic Acid & 300 mg tablet & 500 mg tablet & \\
Ibuprofen & 200 mg tablet & 400 mg tablet & \\
Paracetamol & 100 mg tablet & 500 mg tablet & \\
Morphine, 10mg/ml (as sulfate or hydrochloride), for injection & & \\
Pethidine, 50 mg/ml (as hydrochloride), for injection & & \\
\textbf{Anti-allergics} & & \\
Epinephrine, 1 mg/ml (as hydrochloride or hydrogen tartrate), for injection & & \\
Hydrocortisone, 100 mg in vial (as sodium succinate), powder for injection & & \\
\hline
\end{tabular}
\end{table}

\textsuperscript{43} WHO, Community Emergency Preparedness Manual, p. 73.
<table>
<thead>
<tr>
<th>MEDICINE</th>
<th>Yes</th>
<th>No</th>
<th>No. of units available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prednisolone, 5 mg tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Antidote</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Naloxone, 0.4 mg/ml (as hydrochloride), for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Anti-convulsants</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phenobarbital, 50 mg tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phenytoin, 50 mg (as sodium salt) capsule or tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Anti-infectives</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Intestinal antihelminthics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mebendazole, 100 mg tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Antibacterials</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amoxicillin, 250 mg capsule or tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ampicillin, 500 mg (as sodium salt), powder for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzylpenicillin, 3 g (5 million IU), (as sodium or potassium salt), for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cloxacillin</td>
<td>500 mg (as sodium salt), powder for injection</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>500 mg tablet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phenoxyacetyl benzylpenicillin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>250 mg capsule</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 g (as sodium succinate), powder for injection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doxycycline, 100 mg (as hyclate or monohydrate) capsule or tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erythromycin, 250 mg (as stearate or ethyl succinate) Capsule or tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gentamycin, 40 mg/ml (as sulfate), for injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metronidazole,</td>
<td>200 mg tablet</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>250 mg tablet</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>500 mg/100 ml, injection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfamethoxazole + Trimethoprim</td>
<td>100 mg + 20 mg tablet</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>400 mg + 80 mg tablet</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Anti-fungals</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nystatin, 100,000 IU non-coated tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Anti-malarials</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chloroquine</td>
<td>100 mg tablet (as sulfate or phosphate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>150 mg tablet (as sulfate or phosphate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quinine</td>
<td>200 mg (as sulfate) tablet</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>300 mg (as bisulfate) tablet</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>300 mg/ml, for injection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfadoxine + Pyrimethamine, 500 mg + 25 mg tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Anti-anemia Medications
- Mefloquine, 250 mg tablet
- Ferrous sulfate + folic acid, 200 mg + 0.25 mg tablet
- Folic acid, 5 mg tablet

### Plasma substitutes
- Polygeline, 3.5% injectable solution

### Cardiovascular Medications
- Glyceryl trinitrate, 0.5 mg sublingual tablet
- Hydralazine, 20 mg (as hydrochloride), powder for Injection
- Atenolol, 50 mg tablet
- Methyldopa, 250 mg tablet

### Dermatological Medications
<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>No. of units available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-fungals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzoic Acid + Salicylic Acid, 6% + 3% ointment or cream</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anti-infectives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methylrosanilinium chloride (gentian violet), 0.5% aqueous solution or crystals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silver sulfadiazine 1% cream</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Scabicide and pediculicide</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzyl benzoate, 25% lotion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soap</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ultraviolet-blocking agent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zinc oxide, 15% ointment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disinfectants and antiseptics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlorhexidine[^1], 5%(digluconate) solution, for dilution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polyvidone iodine, 10% solution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium hypochlorite, 70% available chlorine, powder for solution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diuretics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Furosemide, 10mg/ml, for injection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrochlorothiazide, 25 mg tablet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gastrointestinal medications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antacid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aluminum hydroxide, 500 mg tablet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnesium trisilicate compound, 500 mg tablet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anti-emetic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promethazine, 25 mg tablet</td>
<td>25 mg/ml, injection</td>
<td></td>
</tr>
<tr>
<td>Oral rehydration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral rehydration salts, powder for solution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contraceptives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hormonal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethinylestradiol + levonorgestrel, 30 ug + 150 ug tablet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barrier</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Condoms, with or without spermicide

#### Muscle relaxants
- Alcurinium, 5mg/ml (as chloride), for injection
- Neostigmine
  - 0.5mg/ml
  - 2.5mg/ml, for injection
- Suxamethonium, 50 mg/ml (as chloride), powder for injection
- Vecuronium, 10 mg (as bromide), powder for injection

#### Ophthalmological preparations
- Tetracycline, 1% (as hydrochloride), eye ointment
- Gentamycin, 0.3% eye drops

### Oxytocics
- Ergometrine
  - 0.2 mg tablet, (as hydrogen maleate)
  - 0.2 mg/ml, for injection
- Oxytocin, 10 IU/ml, for injection

### Psychotherapeutic medications
- Chlorpromazine
  - 25 mg/100mg tablet (as hydrochloride)
  - 25 mg/ml, for injection

### Anti-asthma
- Aminophylline, 25 mg/ml, for injection
- Salbutamol
  - 4 mg/tablet (as sulfate)
  - 0.1 mg per dose aerosol

### Parenteral solutions
- Glucose
  - 5% isotonic, injectable solution
  - 50% hypertonic injectable solution
- Sodium chloride, 0.9 % isotonic injectable solution
- Compound solution of sodium lactate
- Water for injection, 10 ml ampoule

### Vitamins and minerals
- Ascorbic acid, 50 mg tablet
- Retinol
  - 200,000 IU (110 mg) (as palmitate)
  - 100,000 IU (5.5 mg) for pregnant women

---

*a* Only antimalarials which conform to national malaria treatment guidelines should be used. Failure to do so will have a negative impact on national malaria treatment programmes.

*b* This medicine should be reserved for therapy of confirmed *Plasmodium falciparum* malaria either known or suspected to be resistant to chloroquine or sulfa/pyrimethamine.

*c* Intravenous solutions must always be supplied in plastic containers with an infusion set and needle/s. Glass containers are not acceptable.

*d* Chlorhexidine 20% should be avoided as it needs distilled water for dilution otherwise precipitation will occur. 5% solution is the WHO standard. Alternatives include the combination of chlorhexidine 1.5% + Cetrimide 15%.
The medicines listed in the table above are essential medicines recommended by the World Health Organization for the early phase of emergency.\(^{44}\) This is intended only as a reference list. A health facility may formulate its own emergency kit based on the emergency/disaster situations which are being anticipated.\(^{45}\)

51. Does your health facility have the capacity to store blood products?
   
   ____ Yes
   ____ No

   *If you answered no, please proceed to question 51a; otherwise, proceed to the box after question 51a.*

51a. Where do you get blood and other blood products? *(Please check all applicable answers.)*

   ____ Commercial blood banks
   ____ Other hospitals
   ____ Blood donors
   ____ Others, please specify: _______________

It is recommended that every health facility at the first referral level maintain adequate blood-bank facilities, with particular attention paid to correct storage and handling of blood and blood products.

If a blood bank is not feasible, possible sources of blood products should be identified and a system arranged for quick procurement in times of emergency.

D. Utilities

52. How is water supplied to the health facility? *(Please check all applicable answers.)*

   ____ From a water company
   ____ Deep Well
   ____ Others, specify: _______________

53. Does the health facility have suitable means of storing water?

   ____ Yes
   ____ No

54. Is there an alternative source/s for water in case the main supply gets cut off?

   ____ Yes
   ____ No


\(^{45}\) See Appendix 1 for a list of WHO’s New Emergency Health Kit.
If you answered yes, please proceed to questions 54a-54c; otherwise proceed to the box after question 54c.

54a. What is the alternative source of water? _____________

54b. How is the water from the alternative source treated? (Please check all the applicable answers.)
   ____ Filtration
   ____ Chlorination
   ____ Sedimentation
   ____ Boiling
   ____ Water tablets
   ____ Not treated

54c. How long would the health facility continue to function using the alternative source of water? _________________

Water in a health facility should be safe and potable and contribute to the well being of patients by reducing the risk of infection and propagation of food and water-borne diseases.46

The average water consumption per person is 15 liters per day, distributed as follows:
   o Drink and food – 2.5-3 L (dependent on climate and individual physiology)
   o Basic hygiene practices – 2-6 L (dependent on social and cultural norms)
   o Basic cooking needs – 3-6 L (dependent on food type and norms)

For health facilities, the daily water consumption is estimated to be 5 liters per out-patient, and 40-60 liters per in-patient. Additional liters are needed for laundry, flushing toilets, and other utilities.47

It is thus important for the facilities to have an alternate source of water in case the main supply is cut off. Possible external sources of water supply should be identified, such as a rural water system or the local fire station. If there is a storage tank for water, its capacity should be known so that it may be properly allocated like any other resource.

Regular sanitary surveys should be performed with the aim of assessing conditions and practices that increase public health risks, such as possible sources of contamination in the procurement, transport, and storage of water.48

48 McConnan, p. 67.
55. How is electricity supplied?
   Voltage:  
   110 V  
   220 V  
   Amperage:  
   Cyclage:  

56. Where are the control panels and electric power distribution lines located?

The emergency plan should at least indicate how electric power is supplied to the institution together with other characteristics of the hospital’s electric supply such as amperage or cyclage. This may prove important when outside help is required in storing electrical service.

The location of control panels and power distribution lines should be marked in the floor plan for rapid identification during any emergency situation.

57. Is there an alternative source of electrical supply (emergency power generator)?
   Yes  
   No  

If you answered yes, please proceed to questions 57a-57c; otherwise proceed to the box after question number 57c.

57a. What is the capacity of the emergency power generator?  

57b. What fuel is utilized by the emergency power generator?  

57c. What proportion (in %) of the facility’s energy requirement can it supply?  

For the safety of its occupants, the health facility should have a reliable alternative source of power for emergency lighting and operation of essential equipment. If this is unavailable, immediate impact will be felt at the critical patient areas where increased staffing would be required to provide manual ventilation of intubated patients. Other services that may suffer include the operating room/s, delivery room/s, and nursery. Accidents can occur if hallways and stairwells are not properly lit.

If available, the generating set should be located on the premises but not adjacent to the operating and ward areas. It should be capable of supplying at least 50-60% of the facility’s normal electrical load to maintain the minimum level of services. The recommended circuits to which power should be provided are:

**Lighting**
- all exits, including exit signs, stairways and corridors
- surgical, obstetrical and emergency room operating lights
- nursery, laboratory, recovery room, intensive care unit, nursing station, labor room, and pharmacy
- generator set location, electrical switch-gear location, and boiler room
- one or two lifts, if needed for emergency
- telephone operator’s room
- computer room when available

**Equipment**
- nurses’ call system
- alarm system, including fire alarm
- fire pump and pump for central suction system
- blood bank refrigerator
- sewerage or pump lift system, if installed
- equipment necessary for maintaining telephone service
- equipment in operating, recovery, intensive care and delivery rooms
- one electrical sterilizer if installed

**Heating, cooling, and ventilation system**
- operating, delivery, labor, recovery, intensive care unit, nurseries, and patient rooms

Ideally, after normal power has been interrupted, the generator set should be able to bring full voltage and frequency within 10 minutes to the areas listed above.

---

58. Does the health facility have emergency lights (for use between the period of power interruption and restoration of electrical supply with generator set)?
   _____ Yes
   _____ No

   If you answered yes, please proceed to questions 58a-58b; otherwise proceed to the box after question 58b.

58a. How are the emergency lights activated?
   _____ Manual
   _____ Automatic

58b. Where are they located?
   _____ Nurses’ stations
   _____ Emergency room
   _____ Wards
   _____ Operating Room
   _____ Individual patients’ rooms
   _____ Laboratory
   _____ Hallways
   _____ Lobby
   _____ Stairwells
   _____ Others, specify: _______________

   Emergency lights should be available for use during the period of transfer switching (the period between the interruption of power supply and the connection to a generator set) to light important areas inside the health facility such as stairs and hallways, operating room, emergency room, nurses’ stations and cashier area. They should not be used as substitutes for the generator set.

59. How are medical gases supplied?
   _____ Main pipeline
   _____ Individual tanks
   _____ Others, specify: _______________________

60. Are there safety measures to ascertain prevention of gas spills/leaks?
   _____ Yes
   _____ No
The medical gas supply is vital to the survival of some patients in the health facility but it is also a source of danger if not properly maintained.51

The tanks and/or medical gas pipes must be inspected regularly to ascertain if they are still in good condition. In cases of piped-in gases, there should be safety valves installed to prevent leaks.

E. Warning System and Safety Equipment

61. Is there a system of signs instituted in response to a disaster situation?
   _____ Yes
   _____ No

   If you answered yes, please proceed to question 61a; otherwise go to the box right after the question.

61a. What signs are included? (Please check all applicable answers.)
   _____ escape route indicators
   _____ fire-fighting equipment indicators
   _____ building layout diagram

   Signs inside the health facility should indicate the location of escape routes and fire-fighting equipment.52 A building layout diagram should be provided so that even a stranger unfamiliar with the hospital’s surroundings can easily identify where he/she is and where he/she should go in case there is a need for evacuation.

   Absence of these signs may lead to confusion and panic during an emergency. This may subsequently give rise to occurrence of stampedes and/or trapping of individuals in enclosed spaces.

62. Does the institution have fire detection equipment (e.g. smoke alarms)?
   _____ Yes
   _____ No

   If you answered yes, please proceed to question 62a; otherwise go to question 63.

62a. Is the fire detection equipment strategically located?
   _____ Yes
   _____ No

51 PAHO, Mitigation of Disasters, Volume 2, p. 60.
52 PAHO, Health Services Organization, p. 29.
63. Does the institution have fire extinguishers?
   _____ Yes
   _____ No

   If you answered yes, please proceed to questions 63a-63c; otherwise go to the box after question 63c.

63a. How many fire extinguishers does the institution have? _____________

63b. Are fire extinguishers strategically located?
   _____ Yes
   _____ No

63c. How often are the fire extinguishers replenished/serviced?
   _____ Once a year
   _____ Once in two years
   _____ As needed
   _____ Never
   _____ Others, specify: __________________________

Swift reaction in fighting fires depends on early fire detection. This can be achieved by installing smoke detectors at proper intervals to cover the entire building. Regular checks must be done to ensure detectors are functioning and that they have adequate power supply. Equipment for local fire control includes fire hoses and fire extinguishers which should be placed strategically, in corridors, exit routes, and at the entrances to high-risk rooms such as laboratories. They must be visible and accessible. Regular maintenance of fire-fighting equipment is mandatory. This is especially true for fire extinguishers, the contents of which expire over time and therefore must be regularly replaced.

Coordinate with the local fire protection bureau for guidelines regarding proper placement of fire detectors and fire-fighting equipment.

F. Security

64. Does the health facility have a security unit?
   _____ Yes
   _____ No

   If you answered yes, please proceed to questions 64a-64b; otherwise go to the box after question 64b.

64a. Who provides the personnel for the security unit?
   _____ Health facility
   _____ Private security agency
64b. What areas in the health facility are given top priority in terms of security especially during disasters? (Please check all that apply.)

- Entrance / Exit points
- Main thoroughfares
- Storage area for controlled substances
- Storage area for high-value medical equipment
- Others, specify: ______________________________________

The security of a health facility may be seriously breached during a disaster. The level of risk is magnified if structural damage was incurred. A facility must have either its own security unit, or alternatively, utilize the services of a private security company.

During disasters, security should be tightened in certain high-risk areas of the facility such as the main entrance and exit points, storage areas for controlled substances and volatile chemicals, and areas containing high-value medical equipment.

G. Transportation and Communication

65. What forms of internal communication are being used by the institution? (Please check all applicable answers.)

- Regular telephone
- Cellular telephone
- Pager
- Public address system
- Short-wave radio
- Intercoms
- Runners
- Others, specify: ________________

66. What forms of external communication are being used by the institution? (Please check all applicable answers.)

- Telephone with landline
- Cellular telephone
- Pager
- Facsimile machine
- Short-wave radio
- Runners
- Others, specify: ________________

66a. If the hospital is using telephones (whether landline or cellular), what are alternative forms of communication in case the phone system breaks down? (Please check all the applicable answers.)

- Short-wave radio
- Runners
- Others, specify: ________________
Communication is vital to the success of all coordination efforts. Unfortunately, communication difficulties arising from both equipment failure and human error are the most common problems experienced during disaster situations.\textsuperscript{53}

During California’s Loma Prieta Earthquake in 1989, the most difficult problem during the response phase was information management. Telephone facilities became non-functional early in the response and hospitals later complained that they had little idea of the amount of damage in their communities and the number of patients that they should anticipate. In Watsonville Community Hospital which was close to the epicentre, hand-held radios meant for in-house coordination likewise failed.\textsuperscript{54} Similarly, in the 1990 earthquake in Baguio City, Philippines, the disaster area became virtually isolated due to the lack of communication facilities. A telecommunications company had to deploy satellite dishes to facilitate microwave communication.

67. What means of patient transport are used by the institution? (Please check all applicable answers.)

- _____ Buses, minibuses and vans
- _____ Ambulance
- _____ Trucks
- _____ Private vehicles
- _____ Boats (if applicable)
- _____ Aircraft (both fixed-wing and helicopters)
- _____ Motorcycles
- _____ Others, specify: ___________________

If your facility has at least one ambulance, please answer question 67a; otherwise, please proceed to the box after question 67a.

67a. What are the capabilities of your ambulance/s? (Please fill in the table below).

<table>
<thead>
<tr>
<th>Ambulance capabilities</th>
<th>No. of ambulance in the facility</th>
<th>Personnel assigned to the ambulance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purely for transport, No special equipment</td>
<td></td>
<td>Driver</td>
</tr>
<tr>
<td>With supplies for Basic Life Support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With supplies for both Basic Life Support and Advance Cardiac Life Support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others, specify:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Planning for disaster situations should also entail pooling available resources for patient transport, aside from those already in existence. These may be needed for moving casualties from the field to the health facility, for moving patients to other facilities in cases of referral or overload, or for evacuating and relocating a hospital service.55

Identifying the availability and capabilities of ambulances is important in maximizing their use during emergencies.

H. Public Information

68. Is there a public information centre in the institution?
   ____ Yes
   ____ No

   If you answered yes, please proceed to questions 68a-68e; otherwise go to the box after 68e.

68a. Who coordinates the public information centre? (Please check all the applicable answers.)
   ____ Social worker
   ____ Administrative staff
   ____ Volunteer
   ____ Others, specify: _________________________

68b. Who are tasked to man the public information centre? (Please check all the applicable answers.)
   ____ Social workers
   ____ Administrative staff members
   ____ Volunteers
   ____ Others, specify: _________________________

68c. What services are provided at the information centre? (Please check all the applicable answers.)
   ____ Providing information about patients admitted and discharged
   ____ Finding addresses and whereabouts of family members of patients admitted to the hospital
   ____ Assisting in the identification of victims
   ____ Assisting of family members to locate relatives
   ____ Others, specify: _________________________

68d. Will the Public Information Centre continue to provide the above-mentioned services during disaster situations?
   ____ Yes
   ____ No
   ____ Not sure

68e. Does the Public Information Centre have the capacity to coordinate with the following external entities in the event of a disaster? *(Please check all that apply.)*

- National emergency preparedness agency
- Red Cross and other emergency management agencies
- Other specialized health facilities in the hospital’s vicinity
- Fire department
- Police department
- Local utility companies
- Transport companies (for external means of transporting patients)
- Local funeral homes (for temporary morgue facilities)
- Medical supply vendors

A public information centre should be established where the public can go to request information concerning family members. Its functions include:

1. providing information to family members about patients admitted and discharged
2. finding out the address and whereabouts of the family members of patients admitted to the health facility
3. assisting in the identification of victims
4. helping family members locate victims
5. coordinating with other organizations/ entities outside the facility

It is recommended that the public information centre be coordinated by a social worker and staffed by personnel or volunteers. The health facility’s disaster plan should provide for the continued functioning of the public information centre during disaster situations.\(^{56}\)

69. Are there means to create public awareness of the disaster preparedness plan of the institution?

- Yes
- No

*If you answered yes, please proceed to question 69a; otherwise go to the box after question 69a.*

69a. What are these measures? *(Please check all applicable answers.)*

- Posters
- Hanging signs
- Signboards
- Public Meetings
- Labels on necessary equipment
- Labels on exit doors

In any occurrence of a sudden-onset disaster, the first hours are the most critical because of the strong emotional impact on the population. The resulting disorientation, confusion, and panic are gradually replaced by a more organized reaction. A public awareness campaign which familiarizes people with the disaster preparedness activities of the health facility would not prevent these initial reactions but would hasten a more organized way of reacting.\footnote{PAHO, \textit{Health Services Organization}, p. 21.}

70. How is the public informed of a disaster situation in your catchment area?\hfill \textit{(Please check all the applicable answers.)}

\begin{itemize}
\item Mass media
\item Audible and visual signs
\item Community network
\item Loud speakers
\item Door-to-door announcements
\item Others, specify: ________________
\end{itemize}

71. What methods are used to disseminate emergency plans to the public? \hfill \textit{(Please check all applicable answers.)}

\begin{itemize}
\item Local press
\item Radio
\item Television
\item Public meetings
\item Visits to schools, offices, etc.
\item Brochures
\item Others, specify: ________________
\end{itemize}
Public education is best integrated into the health facility’s disaster plan. The public must be informed of the characteristics of possible disasters and told how they should behave during those times. This would provide additional help to the institution in attenuating the effects of the disaster.\textsuperscript{58}

The intention of informing the public of a disaster situation is to prompt an appropriate response, to reduce public exposure to a minimum. Warning messages should:

a. contain precise information on the hazard,
b. state what action should be taken to protect life and property,
c. describe the consequences to the public of not heeding the warning,
d. provide feedback to the operational decision-makers,
e. cite a credible and respected authority,
f. be short, simple and precise,
g. have a personal context,
h. contain active verbs,
i. repeat important information regularly.

These messages can be put out in various ways depending on the availability of resources in the community.\textsuperscript{59}

During infectious disease outbreaks, information presented to the public should be limited to specific data and results. Speculation, over-interpretation of data, and overly confident assessments of investigations should be avoided. Rumors should be addressed as quickly as possible in order to avoid stigmatization of population groups. Such steps will contribute significantly to the maintenance of order and avoidance of public panic and fear.\textsuperscript{60}


\textsuperscript{60} Centers for Disease Control and Prevention, Public Health Guidance for Community-level Preparedness and Response to SARS, (Supplement G: Communication), 2003, pp. 1-3.
Here are examples of public messages:

“During and after a disaster, there may be a high level of water contamination because of broken water mains. Also, there may be a loss of electricity which would affect the pumping of water to homes. The Ministry of Health will inform you about the situation immediately after the disaster. Do not drink tap water until informed by officials.” [Delivered prior to onset of disaster, concerning water security] \(^{61}\)

“At this time, there is no evidence of ongoing transmission of SARS anywhere in the world. In the absence of SARS transmission, there is no need for concern about travel or other activities. Up-to-date information on SARS is available on the website....” [Delivered shortly after a disease outbreak] \(^{62}\)

V. Assessment of Human Resources

Among all of the health facility’s available resources, personnel remain the most important. This is a fact regardless of the health facility’s bed capacity, degree of technical advancement or whether the hospital is responding to its usual cases or to disaster situations. Thus, it is essential that their level of preparedness be assessed.

The topics covered in this section can be grouped into two aspects. One deals with the organization of the health facility personnel such as the emergency planning group, subcommittees, and inventory and mobilization of personnel; the other covers the preparedness activities for the personnel such as: hazard and vulnerability analysis, drills and training, community involvement, and evacuation.

A. Emergency Planning Group

72. Is there an existing emergency planning group in your institution?
   _____ Yes
   _____ No

   If you answered yes, please proceed to questions 72a-72e; otherwise go to box after question 72e.

   72a. When was this group formed? __________________________

   72b. Who are the members of this planning group? (Please check all applicable answers.)
       _____ Health facility chief executive officer

---

62 CDC, Supplement G, p. 3.
Chief of medical personnel
Head of administration
Director of nursing services
Public Information Centre head
Security services supervisor
Maintenance Chief
Staff representative
A health department representative
Engineer
Architect
Other organizations with which the health facility may interact in emergency management
Others, specify: ________________

72c. Are all members of sufficient seniority to commit the organization to planning group decisions?
Yes
No

72d. Are they capable of contributing to the planning group’s work?
Yes
No

72e. What activities are done by the emergency planning group? (Please check all applicable answers.)
Hazard/potential problem analysis
Structural vulnerability assessment
Non-structural vulnerability assessment
Functional vulnerability assessment
Determine hospital operating capacity during disaster situations
Plan for mobilization of resources
Define roles and responsibilities of each member/group
Ensure training and education of personnel as required
Provide for a monitoring and evaluation system for the emergency preparedness program
Provide pre-disaster photographic documentation of facility buildings and equipment for insurance purposes
Others, specify: ________________
An emergency planning group for the health facility should be formed. The group could consist of:
- the health facility chief executive officer;
- chief of medical personnel;
- head of administration;
- head of field medical service;
- director of nursing services;
- public information centre head;
- security services supervisor
- maintenance chief;
- engineers (structural, electrical, sanitary);
- architect;
- a staff representative;
- a representative of the health department;
- representatives from other organizations with which the hospital may interact in emergency management.\(^{63}\)

<table>
<thead>
<tr>
<th>Each member of the planning group should have a deputy and the group should appoint:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>emergency controller</strong> – responsible for coordinating emergency response; and an</td>
</tr>
<tr>
<td>2. <strong>emergency officer</strong> – acts as project manager for the preparedness program.</td>
</tr>
</tbody>
</table>

The planning process conducted by the emergency planning group gives rise to all the programmes for emergency management and to the necessary strategies and arrangements. It also establishes convention and arrangements among those concerned. The planning group must first conduct hazard assessment which aims to identify:
- the nature, severity and frequency of the hazard;
- the area likely to be affected; and
- the time and duration of impact.

The second step is to conduct **vulnerability analysis** which is the process used to identify vulnerable conditions which are exposed to natural hazards. Vulnerability analysis results in an understanding of the level of exposure to various hazards identified.\(^{64}\) This strategy will provide information concerning the causes of potential emergencies, suggest prevention strategies, and suggest contingent strategies and trigger events.

**Resource analysis** for a health facility should also be conducted including:
- an assessment of the hospital’s capacity for emergency medical response;
- an analysis of the hospital’s capacity to continue providing medical services with damaged or failed services and supplies;
- an analysis of emergency equipment for the protection of the hospital.\(^{65}\)

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73. What type/s of disaster does the health facility prepare for?
   _______ External disasters only
   _______ Internal disasters only
   _______ Both internal and external disasters

The health facility should always be prepared to respond to external disasters to provide assistance to victims. However, like any physical structure, the facility is also vulnerable to disasters directly occurring within its walls. Thus, preparation must be made for response to internal disasters, the most common of which is fire.

74. Does the hospital have an emergency preparedness plan?
   _______ Yes
   _______ No

If you answered yes, please proceed to questions 74a-74e; otherwise go to the box after question 74e

74a. Is the hospital emergency plan documented in writing?
   _______ Yes
   _______ No

74b. How often do you evaluate your disaster preparedness plan?
   _______ Semi-annually
   _______ Annually
   _______ Biannually
   _______ Others, specify: ______________________________

74c. How do you evaluate your disaster preparedness plan?
   _______ By discussion
   _______ By performing drills
   _______ By performing simulation exercises
   _______ Others, specify: ______________________________

74d. When was the plan last updated? ______________________

74e. What is your evaluation of your most recent emergency plan?
   _______ Effective
   _______ Needs changes/improvement
The emergency plan should be documented in writing so that all those who are involved will get an overview of the plan itself and the relationship between some parts and the various agencies involved. It will also enable them to quickly and easily find the part of the plan for which they are responsible. A good plan is simple, brief and can easily be revised.\textsuperscript{66}

Review of the emergency plan should be done at least once a year, then be evaluated according to its effectiveness.\textsuperscript{67} Adjustments must be made in response to changes in the health facility structure, acquisition of new equipment, expansion of health facility services, prevailing social conditions, and acquisition of better knowledge in disaster mitigation.

75. Is there an existing/updated organizational chart for disaster situations?

\begin{itemize}
  \item [\quad] Yes
  \item [\quad] No
\end{itemize}

\textit{If you answered yes, please proceed to question 75a; otherwise proceed to the box after 75a.}

75a. Does the organizational chart follow the structure recommended by the Hospital Emergency Incident Command System (HEICS)?

\begin{itemize}
  \item [\quad] Yes
  \item [\quad] No
\end{itemize}

\textsuperscript{66} Yahmed, pp. 16-17

The Hospital Emergency Incident Command System (HEICS)\(^{68}\) is an emergency management system that utilizes a logical management structure, defined responsibility for every staff member, clear reporting channels, and a unifying nomenclature for health facilities and their emergency responders. HEICS was developed in order to assist the operation of a health facility during crisis situations.

The HEICS organizational chart gives a chain of command which incorporates four sections (Logistics, Planning, Finance, Operations) under the leadership of an Emergency Incident Commander. The following illustrates the general layout of organization:

![Organizational Chart]

Each position has a written *Job Action Sheet* that specifies the important roles and duties of every team member.\(^{69}\)

76. How are the members of the emergency planning group made aware of these management roles? *(Please check all the applicable answers.)*
   - ___ Distribution of copies
   - ___ Regular meetings
   - ___ Others, specify: __________________________

77. How are the members encouraged to actively be involved in preparedness, response or recovery? *(Please check all applicable answers.)*
   - ___ Meetings
   - ___ Drills/exercises
   - ___ Others, specify: __________________________

\(^{68}\) See Appendix 2 for a more detailed overview on HEICS.

Once the emergency management structure is identified by the planning committee, the roles and responsibilities of each member/group must be clearly described, verbally and in writing. This aims to ensure that all required control, coordination and support functions are taken into account, and that there is no overlap between members.\textsuperscript{70}

\textbf{B. Subcommittees}

78. Is the emergency preparedness committee divided into subcommittees or subgroups?

\begin{itemize}
\item [\hspace{1em} ____] Yes
\item [\hspace{1em} ____] No
\end{itemize}

\textit{If you answered yes, please proceed to questions 78a-78d; otherwise go to the box after question 78d.}

78a. What are these subcommittees/subgroups? \textit{(Please check all applicable answers.)}

\begin{itemize}
\item [\hspace{1em} ____] Health
\item [\hspace{1em} ____] Rescue
\item [\hspace{1em} ____] Transport
\item [\hspace{1em} ____] Communication
\item [\hspace{1em} ____] Mutual assistance and welfare
\item [\hspace{1em} ____] Engineering
\item [\hspace{1em} ____] Others, specify: _______________
\end{itemize}

78b. Are the roles and responsibilities of these subcommittees/subgroups clearly defined by the planning committee?

\begin{itemize}
\item [\hspace{1em} ____] Yes
\item [\hspace{1em} ____] No
\end{itemize}

78c. How are these responsibilities assigned to them?

\begin{itemize}
\item [\hspace{1em} ____] According to existing function
\item [\hspace{1em} ____] According to assessed capability of a group
\item [\hspace{1em} ____] By random selection
\item [\hspace{1em} ____] By volunteerism
\item [\hspace{1em} ____] Others, specify: _______________
\end{itemize}

78d. What subcommittee/subgroup is directly involved among the following? \textit{(Please identify.)}

\hspace{20} \textsuperscript{70} Yahmed, p. 10.
<table>
<thead>
<tr>
<th>TASKS/DUTIES</th>
<th>Name of Subcommittee or Subgroup</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 servicing and testing of emergency equipment regularly in accordance with relevant standards and manufacturers’ recommendations</td>
<td></td>
</tr>
<tr>
<td>2 providing advice to management regarding new equipment or existing safety equipment</td>
<td></td>
</tr>
<tr>
<td>3 implementing a yearly plan of hazard audits of hospital to determine that good housekeeping is being maintained and to identify remedial action</td>
<td></td>
</tr>
<tr>
<td>4 planning and coordinating emergency planning group meetings</td>
<td></td>
</tr>
<tr>
<td>5 disseminating emergency plans</td>
<td></td>
</tr>
<tr>
<td>6 reviewing emergency planning at least once a year</td>
<td></td>
</tr>
<tr>
<td>7 exercising emergency plans at least once a year</td>
<td></td>
</tr>
<tr>
<td>8 providing all new, temporary, and casual personnel with a summary of emergency plans at the time of appointment</td>
<td></td>
</tr>
</tbody>
</table>

Functional subcommittees or subgroups are established in order to arrange specific and essential functions for emergency operation. The sectors that may be represented are health, communications, rescue, mutual assistance and welfare, transport, and engineering. Aside from these, there are specific tasks that must not be overlooked. These tasks are as follows:

1. servicing and testing of emergency equipment regularly in accordance with relevant standards and manufacturers’ recommendations;
2. providing advice to management regarding new equipment or existing safety equipment;
3. implementing a yearly plan of hazard audits of health facility to determine that good housekeeping is being maintained and to identify remedial action;
4. planning and coordinating emergency planning group meetings;
5. disseminating emergency plans;
6. reviewing emergency planning at least once a year;
7. exercising emergency plans at least once a year through drills;
8. providing all new, temporary, and casual personnel with a summary of emergency plans at the time of appointment.

Subcommittees/subgroups must be formed according to existing functions in the day-to-day operation of the health facility. For every element of the plan, it must also be established whether a subcommittee has an essential (primary) role in terms of responsibility for initiative and continuity action, a secondary role, with responsibility for supporting another group which has a primary role to play, or no role at all.

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72 Yahmed, p. 10.
C. Inventory of Personnel

79. How many doctors does your health facility have? *(Please fill in the table below.)*

<table>
<thead>
<tr>
<th>Areas of Specialty</th>
<th>No. of consultants</th>
<th>No. of Residents</th>
<th>No. of Interns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Medicine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal Medicine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obstetrics and Gynecology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pediatrics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anesthesiology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ophthalmology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orthopedics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Others, please specify:</em></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

80. How many staff members does the health facility have per ward/area? *(Please fill in the table below.)*

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<thead>
<tr>
<th>Ward/Area</th>
<th>Bed capacity of ward/area</th>
<th>No. of Staff Nurses/Shift</th>
<th>No. of Nursing Aides/Shift</th>
<th>No. of Orderlies/Shift</th>
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81. How many laboratory/radiology technicians does your health facility have?

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<thead>
<tr>
<th>Laboratory/ Radiology Area</th>
<th>No. of Technicians/ Shift</th>
<th>No. of Shifts</th>
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Like other resources, there should be knowledge of the number of human resources available in the health facility in the event of disaster. The number of personnel that could be called into service should also be known so that equitable distribution of personnel may be done. These personnel should be assigned to perform tasks similar to their day-to-day activities for them to function maximally.

Rest, food, and water breaks should be enforced since the medical personnel are generally reluctant to ask for these while victims are in need.73

D. Mobilization of Personnel

82. How are alarms raised during disaster situation? (Please check all applicable answers.)
   ____ Alarm
   ____ Bell
   ____ Megaphone
   ____ Verbal
   ____ Siren
   ____ Others, specify: ________________

83. Who may activate the alarm? (Please check all applicable answers.)
   ____ Special committee
   ____ Administrator
   ____ Director of health facility
   ____ Others, specify: ________________

The emergency planning committee should clearly define situations that would warrant the activation of the plan. A responsible person and a number of alternates should then be clearly designated for the decision to put the plan into effect. A mechanism should be arranged for raising the alarm to inform personnel on duty that the disaster plan has been activated.74

84. Does the administration have an updated list of addresses and telephone numbers of all staff involved in the emergency preparedness plan?
   ____ Yes
   ____ No

If you answered yes, please proceed to question 84a; otherwise, proceed to question 85.

73 Waeclerle, p. 818.
84a. Is the list of addresses and telephone numbers of hospital staff always located in an accessible area?
   ____ Yes
   ____ No

85. Does the health facility have a diagram of the communication network?
   ____ Yes
   ____ No

Aside from an organizational chart, the health facility disaster-preparedness plan should include a diagram of the health facility’s communication and transmission network. This is to ensure prompt and efficient information dissemination among the personnel. If an organized network is not present, some personnel may be inadvertently skipped or duplication of effort may occur.

86. Is there a pre-assigned emergency operations center (EOC) in the institution?
   ____ Yes
   ____ No

If you answered yes, please proceed to questions 86a-86b; otherwise go to the box after question 86b.

86a. Where is it located? _______________________

86b. Who is/are assigned to run the operation centre?
   ____ Administrative personnel
   ____ Physician
   ____ Nurse
   ____ All of the above
   ____ Others, specify: ____________________

A pre-determined site must be chosen for the Emergency Operations Centre (EOC) so that all personnel know where to report important information and/or get instructions. This is important in maintaining a unified intra-hospital command. The functions of the EOC include:
⊕ activation of the plan by the designated person;
⊕ control and coordination of hospital activities;
⊕ provision of additional resources
⊕ liaison with the overall emergency control centre;
⊕ control of field medical services.

It is recommended that the command personnel should include at least one physician, nurse, and administrator.75

87. Does the health facility have an on-site disaster response team?
   _____ Yes
   _____ No

If you answered yes, please proceed to questions 87a-87b; otherwise go to the box after question 87b.

87a. Who are the members of the on-site disaster response team? (Please check all applicable answers.)
   _____ ER Physician-on-duty
   _____ Family Medicine Resident-on-duty
   _____ Surgery Resident-on-duty
   _____ ER Nurse-on-duty
   _____ Emergency Medical Technicians (EMTs)
   _____ Volunteers
   _____ Others, specify: ____________________

87b. Which of the following are team members trained to do? (Please check all applicable answers.)
   _____ Analyze the magnitude of disaster
   _____ Coordinate efforts of various hospitals/support groups
   _____ Basic Life Support
   _____ Advanced Cardiac Life Support
   _____ Perform limited surgery when necessary
     (e.g. doing amputation to free trapped victims)
   _____ Relieve pain and anxiety of the injured
   _____ Indicate the order of how casualties must be rescued according to medical condition (Initial triage)

The health facility could create an on-site disaster response team depending on the availability of physical and human resources. The basic pre-requisite for the personnel in this team is that they be properly trained in first aid and that they have the necessary means to move immediately to the scene of disaster. It is, however, more desirable for members of the team to be properly trained in disaster medical care so that they may be better prepared for working under austere field conditions. They should not come from the ER personnel on-duty unless back-up personnel can take over. This is to ensure that the ER has the necessary personnel to accommodate incoming victims.

The physicians in this team should try to determine the magnitude of the disaster with the help of whoever is in-charge at the disaster area and make the proper coordination with the health facilities that can receive victims. Initial triage may be established at the disaster site so that priorities for treatment and evacuation may be designated. At the initial triage site, assessment is usually just based on respiration, pulse, and mental status. Vigilant monitoring is necessary since a patient’s triage status can be re-prioritized during transport to a health facility.
88. Do you have a pre-assigned area for reception of victims at the health facility?
   _____ Yes
   _____ No

*If you answered yes, please proceed to question 88a; otherwise go to question 89.*

88a. Where is the pre-assigned area for reception located?
   _____ Inside the emergency room
   _____ Outside the emergency room but inside the health facility
   _____ Outside the health facility
   _____ Others, specify: __________________

89. Do you have a pre-assigned area for triage in the health facility?
   _____ Yes
   _____ No

*If you answered yes, please proceed to questions 89a-89c; otherwise go to the box after question 89c.*

89a. Where is the pre-assigned area for triage located?
   _____ Inside the emergency room
   _____ Outside the emergency room but inside the health facility
   _____ Outside the health facility
   _____ Others, specify: __________________

89b. Who is/are tasked to man the triage area? *(Please check all applicable answers.)*
   _____ General Practitioners
   _____ Surgeons
   _____ Internists
   _____ Physicians trained in traumatology
   _____ Nurses
   _____ Volunteers
   _____ Paramedical personnel
   _____ Others, specify: __________________

89c. What functions are assigned to the triage team? *(Please check all applicable answers.)*
   _____ Classification of patients according to priority of treatment
   _____ Referral of the patient/s to the right place within the health facility
   _____ Referral of the patient/s to other treatment centers following stabilization
   _____ Updating the Health Facility Emergency Committee of the situation
During disaster situations where there is an expected increase in patient consultations, a reception and triage area should be established. Reception includes receiving patients and directing them to specific areas where they can receive initial treatment. On the other hand, triage is the process of setting priorities to ensure that the largest possible number of patients is treated. Functions of the triage team include the following:

1. classification of patients according to priority
2. referral of the patient/s to the right place within the health facility;
3. referral of the patient/s to other treatment centres following stabilization;
4. updating the hospital’s emergency committee of the situation.

A successful triage will make possible the rationalization of existing resources in the hospital and therefore will determine the success of all relief activities.\(^\text{77}\)

The emergency plan should specify an area for triage and reception, which may be located inside or outside the health facility, but should be as close as possible to, but outside of, the emergency room or the established primary treatment areas. Entry for all patients should be restricted to one point leading to the triage area.

Personnel with experience in the field of emergencies, surgery or traumatology should be part of the triage team, which is ideally composed of a doctor, a nurse and an auxiliary in charge of keeping statistics. As many triage teams as are needed and is feasible should be formed. However, once the triage team completes its task, members should be incorporated into other teams as needed.

90. Do you have an established system for proper categorization and tagging of patients/casualties (e.g. color-coding)?
   ____ Yes
   ____ No

Proper categorization and tagging of patients are functions of the triage team. The parameters are based on severity of injuries, prognosis, and the chances that the action taken may contribute to the recovery of the patient. This would hasten the initial diagnostic and therapeutic management and maximize efforts of health personnel.

The degrees of priority can be represented through the utilization of colors. A sample guideline for tagging of patients suggested by the Pan America Health Organization (PAHO) is presented here.\(^\text{78}\)

\(^{78}\) PAHO, *Health Services Organization*, pp. 15-17.
**Red Tag**
This signifies that the patient is a first priority for evacuation or treatment. These patients 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 1 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 air passages).

**Yellow Tag**
Identifies patients that receive second priority for evacuation or treatment since their injuries are not life-threatening.
1. Second-degree burns covering more than 30% of the body;
2. Third-degree burns covering 10% 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 (500-1000 cc);
6. Dorsal lesions, with or without injury to the spinal column;
7. Conscious patients with significant craniocerebral damage (serious enough to cause 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 per minute;
   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**
Patients who are given third priority for evacuation and treatment 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. 2nd degree burns covering less than 15% of the body;
   b. 3rd degree burns covering less than 25% of the body;
   c. 1st degree burns covering less than 20% of the body, excluding hands, feet and face.

**Fatal Injuries**

1. 2nd and 3rd degree burns over more than 40% of the body with death seeming reasonable certain.
2. 2nd and 3rd degree burns over more than 40% of the body, with other major lesions, 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 to movement.
6. Patient over 60 years old with major lesions.

It should be noted that the line separating the yellow-tag patients with fatal injuries from red-tag patients is very narrow. If there are patients belonging to the red-tag category mentioned above, this system will have to be followed. If there are none, the yellow-tag patients with apparently fatal injuries become red-tag patients. This is because 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**

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

91. Are there specific people assigned for security and crowd-control?

_____ Yes
_____ No

If you answered yes, please proceed to question 91a; otherwise go to the box after question 91a.

91a. What are these people tasked to do?
Close off other points of entry that are not vital to the emergency operations of the health facility
Control the flow of people entering the health facility
Direct people to appropriate areas inside the health facility
Act as marshals in case evacuation is necessary
Others, specify: ______________________

Security and crowd-control are important tasks that must be assigned to specific people in times of emergency. Crowd-control minimizes the number of people inside treatment areas. This also means directing people to wherever they can be attended to or determining whether they need medical attention or just information about relatives. Done efficiently, this helps reduce the chances of violence in a highly emotional atmosphere. This allows other health facility personnel to direct their efforts to important tasks at hand.

Marshals are vital to evacuation efforts. They may be of help in directing the flow of the evacuees and in physically assisting them. This is especially true for health facilities where many of the evacuees are with limited physical capabilities.

E. Hazard and Vulnerability Analysis

92. Has the emergency preparedness group conducted hazard and vulnerability analysis?
   ____ Yes
   ____ No

   *If you answered yes, please proceed to question 92a-92c; otherwise go to the box after question 92c.*

92a. What techniques were involved? *(Please check all applicable answers.)*
   ____ Identification of hazard
   ____ Listing of possible effects
   ____ Listing of potential problems
   ____ Determining causes
   ____ Develop preventive strategies
   ____ Develop response and recovery strategies and trigger events for these strategies

92b. What benefits have been realized from this tool? *(Please check all applicable answers.)*
   ____ Obtained a list of possible hazards
   ____ Identified the most likely and damaging hazards
   ____ Identified the effects of those hazards in the health facility infrastructure and community
Obtained a firm basis for health facility emergency management planning

92c. What types of hazard does the health facility prepare for? (Please check all applicable answers.)

____ Earthquake
____ Flood
____ Fire
____ Tsunami
____ Hurricane
____ Volcanic eruption
____ War/Armed conflict
____ Epidemic
____ Infectious Disease Outbreak
____ Chemical/Radiologic Emergency
____ Industrial/Technological
____ Others, specify: ______________
Hazard analysis is a process of analyzing potential risks and their effects on the health facility’s infrastructure and the community. It is in general, a qualitative process although it may be necessary to consult quantitative risk analysts for some particular hazards (e.g. engineers for seismic vulnerability of infrastructure).

The expected benefits in conducting a hazard analysis are:
1. obtaining a list of possible hazards;
2. identifying the most likely and possible hazards;
3. identifying the effects of those hazards in the health facility infrastructure and the community;
4. obtaining a firm basis for health facility emergency planning.\textsuperscript{79}

The hazard analysis process\textsuperscript{80} can be charted as shown on the flowchart below. Examples are provided inside the boxes on the lower portion.

---

\begin{itemize}
  \item Identify hazard/s
  \item Earthquake

  \item Describe hazard/s
  \item地面运动，通常突然发生且无预警。

  \item Describe community and environment
  \begin{itemize}
    \item 位于地震活跃地区
    \item 非抗震建筑
    \item 低意识水平（员工）
  \end{itemize}

  \item Describe effects
  \begin{itemize}
    \item 生命/身体伤害
    \item 广泛的基础设施和基本服务损失或损害
    \item 严重的社会学和心理学后遗症
  \end{itemize}

  \item Prioritize hazards
  \begin{itemize}
    \item 结构完整性
    \item 公众意识
  \end{itemize}

  \item Determine planning objectives
  \begin{itemize}
    \item 启动减缓措施（结构，等）
    \item 创造员工教育和培训计划
  \end{itemize}
\end{itemize}

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\textsuperscript{79} Yahmed, pp. 7-8.
\textsuperscript{80} Yahmed, pp. 8.
F. Training and Drills

93. Is the institution supporting training and education of staff members for emergency preparedness?
   ____ Yes
   ____ No

   *If you answered yes, please proceed to question 93a-93d; otherwise go to question 93.*

93a. What strategies have been tried? *(Please check all applicable answers.)*
   ____ Workshops, seminars, conferences
   ____ Self-directed learning
   ____ Individual tuition
   ____ Exercises
   ____ Pamphlets, videos, media
   ____ Informal/formal presentations
   ____ Public displays, meetings
   ____ Others, specify: ______________

93b. What stages are involved in training? *(Please check all applicable answers.)*
   ____ Analyze training need
   ____ Design training
   ____ Develop instruction
   ____ Conduct instruction
   ____ Validate training

93c. How often does the institution conduct training?
   ____ Biannually
   ____ Annually
   ____ As necessary
   ____ Others, specify: ______________

93d. How many attended the most recent training conducted by the institution?
   ____ *(actual number)*
   ____ % *(proportion of those who attended among those who need to be trained)*

94. Is there a regular drill/exercise being conducted in preparation for any disaster occurrence?
   ____ Yes
   ____ No

   *If you answered yes, please proceed to question 94a-94b; otherwise go to the box after question 94b.*
94a. How regular are these drills done?
   _____ Quarterly
   _____ Semi-annually
   _____ Annually
   _____ Others, specify: ________________

94b. Who heads the drills?
   _____ Special committee
   _____ Administrator
   _____ Director of health facility
   _____ Others, specify: ________________

95. Is there financial support for the training and drills mentioned above?
   _____ Yes
   _____ No

If you answered yes, please proceed to question 95a-95b; otherwise go to the box after question 95b.

95a. What are the sources of financial support? (Please check all applicable answers.)
   _____ Donation
   _____ Insurance
   _____ Allotment from the health facility’s budget
   _____ Others, specify: ________________

95b. How much is the budget for these preventive measures? _______/year

Ideally, a sufficient amount from the institution’s budget should be reserved for disaster mitigation activities, which include drills and training. If this cannot be done, coordination with local government units and some non-governmental organizations may yield positive results.

G. Evacuation

96. Is there a system for evacuation of the institution?
   _____ Yes
   _____ No

If you answered yes, please proceed to question 96a-96c; otherwise go to the box after question 96c.

96a. Which among the following stages of evacuation are being conducted in the institution? (Please check all applicable answers.)
   _____ Warning
   _____ Withdrawal
   _____ Return
96b. In general, what activities are done in connection with the evacuation? (Please check all applicable answers.)

_____ Identifying options of vertical or horizontal evacuation within the health facility
_____ Identifying the type of signal or alarm that will signify that an evacuation is required
_____ Outlining the evacuation routes
_____ Identifying the assembly areas
_____ Establishing the means of accounting for evacuees
_____ Anticipating types of support or assistance likely to be required by patients
_____ Establishing the type of “all clear” signal 82 that will be given

96c. Is there an evacuation warden assigned for each part of the health facility?

____ Yes
____ No

Total or partial evacuation of health facility patients, personnel and visitors could be required by internal or external emergencies. Careful planning before an emergency/disaster occurs is needed to come up with evacuation procedures since evacuation is a hazard in its own right. It exposes staff, patients and visitors to danger.

Assigning an evacuation warden for each part of the health facility to ensure that all people leave when required may minimize the dangers associated with evacuation. It will also be helpful if the alarm message for the evacuation specifies the following:
- the part of the health facility to be evacuated;
- any particular area to avoid while evacuating due to current hazards;
- any other deviations from the pre-planned evacuation procedure.

The evacuation procedures should specifically identify the following items:
1. options of vertical or horizontal evacuation within the health facility;
2. type of signal or alarm that will signify that an evacuation is required;
3. evacuation routes;
4. assembly areas;
5. means of accounting for evacuees;
6. types of support or assistance likely to be required by patients;
7. type of “all clear” signal. 83

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81 Vertical evacuation within a building involves movement to another floor/storey of a building, while horizontal evacuation entails movement to another part of the building within the same floor.
82 An “all clear” signal is an example of a signal given to signify that no imminent danger is present.
H. Health Facility Networking

97. Is your disaster plan coordinated with those of other health facilities in your area?
   _____ Yes
   _____ No

*If you answered yes, please proceed to question 97a-97b; otherwise go to the box after question 97b.*

97a. Is your coordination part of a formal agreement?
   _____ Yes
   _____ No

97b. Do you perform drills together?
   _____ Yes
   _____ No

Health facilities should maximize their existing network in times of disaster. The pooling of resources starts with the coordination of disaster plans. Areas of collaboration may include the establishment of proper patient referral system, sharing of resources, and conducting joint drills and personnel training programs. For example, one facility may absorb the existing patient load of another that is identified as the main receiving center for disaster victims. This practice expands all available resources of the involved health facilities, making them more capable of responding to disaster situations.

I. Community Involvement

98. Does the institution take into consideration the characteristics of its community in responding to emergency situations?
   _____ Yes
   _____ No

*If you answered yes, please proceed to question 98a; otherwise go to the box after question 98a.*

98a. What characteristics of the community are taken into account? *(Please check all applicable answers.)*
   _____ Demography
   _____ Environment (plants, animals, waters, air and soil)
   _____ Infrastructure
   _____ Culture
   _____ Economy
   _____ Disease pattern
   _____ Others, specify: _______________
Ideally, the health facility takes into consideration some characteristics of the community in responding to emergency situations. These are important in preparing supplies for the most probable diseases that may occur during emergency situations, in anticipating additional problems that may arise, and in identifying possible sources of human and material support.

99. Does the local community have its own disaster preparedness plan?
   _____Yes
   _____No

   If you answered yes, please proceed to question 99a; otherwise go to the box after question 99a.

99a. Is the health facility disaster preparedness plan coordinated with the community disaster preparedness plan?
   _____Yes
   _____No

Helping the local community develop its own disaster plan may prove to be vital especially in some areas in developing countries that remain isolated by poor communication and transportation facilities. Access to health facilities by patients from these areas is meagre even under normal conditions. Obviously, during a disaster, the difficulty is accentuated and these areas may remain isolated for some time. It is thus necessary to train these people to initially deal with the disaster situation themselves in the best possible way.\(^4\)

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Part III - Assessment of Preparedness for Specific Emergencies

I. Assessment of Industrial Emergency Preparedness

Technological advances and rapid industrialization is giving rise to a new kind of disaster involving the release of hazardous substances or their by-products into the environment. This kind of disaster is termed industrial or human-made.85

Almost everyone is at risk from this kind of disaster as developed countries increase their reliance on high-level industrialization for vital services such as electric power and telecommunications. In developing countries, on the other hand, the vulnerability results from importation of technology that is often not accompanied by training on how to utilize it properly. This is worsened by the fact that sometimes the required safety measures are lacking or done poorly due to cost-saving efforts, thus, preparing a perfect breeding ground for the occurrence of a disaster.

Planning for mitigation of industrial disasters should involve a multi-disciplinary body (e.g., law enforcement officials, public health authorities, and safety engineers). For health facilities within the vicinity of industrial firms and transportation routes used by vehicles conveying potentially hazardous materials, special responses are needed to ensure they can continue their task of protecting and saving lives. This section is designed to help these health facilities assess their capacity to respond to industrial disasters.86

Health facilities should consider the possibility of having to respond to an industrial disaster if they are located near industrial firms and/or near major transportation routes used by vehicles conveying potentially hazardous substances. Inadvertent accidents such as chemical spillage or transportation accidents resulting in chemical spillage might result in contaminated patients who would seek help from the health facility. The occurrence of an industrial accident might also have a direct effect on the health facility structure and its occupants. These situations involve a specific kind of preparedness.

1. Is there an industrial firm within your health facility’s catchment area?
   _____ Yes
   _____ No

   If you answered yes, please proceed to question 1a; otherwise, go to question 2.

1a. What is the distance of the industrial firm from the health facility?

2. Is the health facility near a roadway frequently used by vehicles conveying

86 Lillbridge, pp. 354-355.
potentially hazardous substances in or out of an industrial firm/s?
____ Yes
____ No

3. What kind of substances are used or produced by the industrial firms and/or transported by the vehicles? (Please check all applicable answers.)
____ Acids
____ Ammonias
____ Bases
____ Chlorines
____ Cyanides
____ Herbicides
____ Insecticides
____ Polychlorinated biphenyls
____ Radioactive substances
____ Volatile organic compounds
____ Do not know
____ Others, specify: _______________________

For health facilities located near industrial firms and their main transportation routes, part of the hazard and vulnerability analysis should be identifying potentially hazardous substances that can cause life-threatening situations. These substances may be used as raw material, produced as the main product or by-product, or transported in quantities to and from the manufacturing firms. Adequate information regarding the properties of substances, their clinical effects, procedures for proper neutralization, and appropriate antidotes should be gathered and made available to concerned medical personnel. This knowledge will be useful if inadvertent chemical spills or substance contamination occurs or if accidents involving the transporting vehicles take place near the health facility. In the deadliest industrial disaster which occurred in 1984 in Bhopal, India, ethyl isocyanate vapor was accidentally vented into the atmosphere. Methyl isocyanate is an intermediate product in the production of carbamate pesticides and is capable of causing chemical pneumonitis after inhalation. This substance spread throughout the residential neighborhood; killing more than 2,500 people and affecting about 200,000 more. The victims swamped local health facilities while authorities tried to understand the nature and toxicity of the offending agent, the proper treatment, and the length of decontamination needed.

Failure to consider emergency situations of this kind could lead to inappropriate patient management and risk of secondary contamination of unsuspecting medical personnel and patients.

87 See Appendix 4 for a list of establishments likely to hold hazardous materials.
88 Lilibridge, pp. 354-355.
4. Are antidotes for the substances identified in question number 3 present in your health facility?
   _____ Yes
   _____ No
   _____ Not applicable

   If you answered yes, please fill in the table below; otherwise, proceed to question no. 5.

<table>
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<tr>
<th>Substance</th>
<th>Antidote</th>
<th>Indication</th>
<th># of units in stock</th>
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5. Are there nearby sources of antidotes?
   _____ Yes
   _____ No

   If you answered yes, please fill in the table; otherwise, proceed to question number 6.

<table>
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<tr>
<th>Source</th>
<th>Antidote</th>
<th>Time to reach source</th>
<th>How to reach source</th>
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<tbody>
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6. Is the health facility capable of contacting any poison control or assistance centre?
   _____ Yes
   _____ No

   If you answered yes, please proceed to question 6a-6d; otherwise, go to question number 7.

6a. Which poison control/assistance centre can you easily get in touch with? __________________________

6b. Is this center accessible 24 hours a day, everyday of the week?
   _____ Yes
   _____ No
6c. What means exist for contacting the centre? *(Please check all applicable answers.)*

- Telephone
- Short-wave radio
- Internet
- Electronic mail
- Others, specify: __________________________

6d. Do all relevant personnel know how to contact the poison control/assistance centre?

- Yes
- No

7. Does the health facility have local experts who may offer assistance in the management of these patients?

- Yes
- No

*If you answered yes, please proceed to question 7a; otherwise, go to the box after question 7a.*

7a. What are their areas of expertise?

- Toxicology
- Pharmacology
- Industrial hygiene
- Occupational medicine
- Chemistry
- Others, specify: __________________________

The availability of up-to-date antidotes and other pharmaceutical substances necessary for the treatment of patients injured by hazardous substances should be ensured. Even prior to an emergency, it is prudent to develop active antidotes for substances that have no or insufficient antidotes.\(^{89}\)

Links with poison control centre/s for assistance must also be established. The means of contacting these centres must be identified and made accessible to emergency personnel for immediate retrieval in case of need. If there are resource persons within the community, they should also be contacted. Professionals in the field of toxicology, pharmacology, industrial hygiene, occupational medicine or chemistry might be able to offer immediate assistance in the management of disaster.\(^{90}\)

---


8. Does the health facility coordinate regularly with the nearby industrial firms and local authorities?

_____ Yes
_____ No

*If you answered yes, please proceed to questions 8a-8d; otherwise, go to the box after question 8d.*

8a. What are the areas of coordination that exist?

_____ Drafting of disaster plans
_____ Conducting joint hazardous materials disaster drills
_____ Conducting training seminars regarding industrial disasters
_____ Conducting periodic medical evaluation of the industrial firm’s employees
_____ Conducting public information campaign regarding industrial disasters
_____ Others, please specify: ____________________________________________

8b. Is the health facility constantly updated with regard possible hazards present in nearby industrial firms?

_____ Yes
_____ No

8c. What are the health facility’s responsibilities in the event of an industrial disaster?

_____ Send a team for search and rescue operations
_____ Act as the primary receiving hospital for victims
_____ Assist in conducting victims to other health facilities
_____ Others, please specify: ________________________________

8d. Who are the identified key players during an industrial emergency? *(Please check all that apply.)*

_____ Health facility liaison officer
_____ Police services
_____ Fire protection service
_____ Civil defense agencies
_____ Public works and utilities
_____ Industrial firm management
_____ Public information outlets
_____ Public health agencies
_____ Environmental agencies
_____ Others, please specify: _____________________________________
Coordination with public authorities and industrial firms will allow the health facility to obtain relevant information regarding possible hazards within the installation and surrounding areas. All parties expected to participate in an emergency response, along with each party’s roles and responsibilities, should be delineated in the emergency plan. Ideally, close coordination should be maintained between the following entities: Health facility liaison officer (or its equivalent), police services, fire protection services, civil defense agencies, public works and utilities, management of the industrial firm, public information outlets, and public health & environmental agencies.  

9. Does the health facility have adequate amenities for decontamination?  
____ Yes  
____ No  

10. Does the health facility have the capacity to evacuate its patients and personnel if the facility itself becomes contaminated?  
____ Yes  
____ No  

If you answered yes, proceed to questions 10a-10d; otherwise proceed to the box after 10d.  

10a. Where do you refer contaminated patients?  

<table>
<thead>
<tr>
<th>Referral health facility</th>
<th>Distance from your health facility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

10b. Are there transportation procedures for these patients?  
____ Yes  
____ No  

10c. Are medical personnel required to accompany the patient/s to the other health facility/ies?  
____ Yes  
____ No  

10d. Is there a provision for decontamination of the vehicle/s that conducted the contaminated patient/s?  
____ Yes  
____ No  

91 OECD, pp. 95-96.
In responding to industrial emergencies the adequacy of medical facilities, including transportation facilities, should be ensured. Some aspects of preparedness include decontamination equipment, protective equipment for personnel, and evacuation protocols.\textsuperscript{92, 93}

11. After a significant industrial emergency, does the health facility have the means to follow-up all persons exposed to the hazardous substances?

- Yes
- No

*If you answered yes, proceed to questions 11a-11b; otherwise, proceed to question 12.*

11a. Are all exposed persons, regardless of presence or absence of symptoms, registered for short- and long-term follow-up?

- Yes
- No

11b. Are biological samples taken from those who were exposed as soon as possible after an incident?

- Yes
- No

12. After an incident, are procedures in place for sharing of information regarding the short- and long-term effects of acute exposure to hazardous substances between the health facilities, industrial firms, local government, and other involved parties?

- Yes
- No

After an industrial emergency, there must be appropriate follow-up procedures in place for the monitoring and observation of persons exposed to hazardous substances. Even those who may appear asymptomatic have to be followed-up because the onset of symptoms can be delayed for hours or days after exposure. To facilitate follow-up, all persons with significant exposure should be registered. Ideally, biological samples should be taken as soon as possible after exposure and at regular intervals.

In order to apply lessons learned from a crisis situation to future events, further efforts should be made to promote the sharing of information concerning appropriate treatment, epidemiological data, and follow-up data involving hazardous substances.\textsuperscript{94}

\textsuperscript{92} OECD, p. 99.

\textsuperscript{93} Refer to Part III-II & III for a more detailed discussion on protective equipment and decontamination.

\textsuperscript{94} JOECD, p. 129.
II. Assessment of Infectious Disease Outbreak Preparedness

Infectious disease outbreaks pose a distinct challenge for health care facilities. The number of affected patients who need emergent medical care can rise exponentially, affecting a wide area within a particularly short period of time. Moreover, health care personnel, because of their constant interaction with the afflicted, are themselves highly susceptible to disease and may in fact hasten the spread of the causative organism in the community. Indeed, well documented epidemics in the past have illustrated how disease outbreaks can stretch a health facility’s resources to its limits. Thus, every facility must have a high level of preparedness prior to an infectious disease outbreak, for the most effective systems are those that were devised and tested prior to crisis situations. This subsection aims to assist health care managers in assessing whether present infrastructure, functional, and human resources can keep the impact of an epidemic in a health facility to an acceptable minimum.

A. Infrastructure Assessment

During epidemics, delays in immediate diagnosis and isolation of suspect cases contribute significantly to the spread of disease. Aside from the universal standard precautions, health facilities should always observe transmission-based precautions. These are designed for patients who are either suspected or proven cases of a highly infectious or epidemiologically important pathogen.

Isolation aims to disrupt the interconnections between the elements of disease transmission: source of microorganism, susceptible host, mode of transmission. Precautions should consider the possibility of contact, droplet, or airborne transmission.\(^{95}\)

13 Does the health facility have an existing evaluation or triage area/s for all incoming patients?

_____ Yes
_____ No

If you answered yes, proceed to questions 13a-13b; otherwise, go to question 14.

13a. Where is/are the evaluation area/s located? (Please check all applicable answers.)

_____ Outside the emergency department
_____ Inside the emergency department
_____ Outside the outpatient department
_____ Inside the outpatient department

13b. In the event of an epidemic, can this area be adequately isolated from the rest of the facility?
   _____ Yes
   _____ No

14. Are there specially designed infectious disease isolation units in the hospital?
   _____ Yes
   _____ No

   *If you answered yes, proceed to questions 14a-14b; otherwise, go to question 15.*

14a. What provisions are found in these units? *(Please check all applicable answers.)*
   _____ Individual rooms
   _____ Partitioned beds in one big ward
   _____ Negative air pressure
   _____ Separate air control / ventilation system
   _____ Individual handwashing facilities
   _____ Shared handwashing facilities
   _____ Individual toilets
   _____ Shared toilets
   _____ Sealed windows
   _____ Self-closing doors
   _____ Anterooms with gloving / gown-donning facilities
   _____ Separate waste disposal units

14b. What is the total bed capacity of all the isolation units? _____

15. What other areas in the facility can be temporarily converted into an isolation unit in the event of an epidemic?

<table>
<thead>
<tr>
<th>Area</th>
<th>Bed Capacity</th>
<th>With Negative Pressure? (Y/N)</th>
<th>Individual rooms? (Y/N)</th>
<th>Separate exhaust? (Y/N)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
During the recent SARS epidemic, transmission was controlled by assigning suspect cases to a separate evaluation unit. This may be a temporary or existing structure.\textsuperscript{96}

If confinement is necessary, patients should be assigned to a separate unit. Ideally, each patient should be placed in a room with air pressure that is negative in relation to the corridor. Doors should remain closed as much as possible. Each room should have its own handwashing and toilet facilities. If above setting is not possible, cohorting of similar cases to a single floor/area may be done. If possible, such an area should have independent air supply and exhaust systems.\textsuperscript{97}

The assignment of a separate SARS unit in health facilities during the recent SARS epidemic proved to be an effective strategy in Toronto and Canada.\textsuperscript{98}

16. Is there a heating, ventilation, air conditioning (HVAC) system installed in your facility?
   \[\begin{array}{ll}
   & \text{Yes} \\
   & \text{No} \\
\end{array}\]
   If you answered yes, proceed to questions 16a-16c; otherwise, go to the box after 16c.

16a. How long has the HVAC system been installed?__________

16b. What is the ambient temperature in the facility?_____; ambient humidity?_______

16c. How much Air Changes per Hour (ACH) are provided for by the HVAC system?______


\textsuperscript{97} www.who.int/csr/surveillance/infectioncontrol/en, 2003

\textsuperscript{98} www.cdc.gov/ncidod/sars, 2003
Heating, Ventilation, Air Conditioning (HVAC) systems maintain indoor air temperature and humidity at comfortable levels. Air temperature is usually maintained at 24°C, while humidity is kept at 30-60%. Moreover, HVAC systems control odors, remove contaminated air, and facilitate air-handling requirements to protect from airborne pathogens, thereby minimizing risks of microbial transmission from infected patients.\(^9\)

Areas housing patients infected with microorganisms that are spread via airborne transmission require special ventilation control systems.\(^{100}\) Although the most effective way of maintaining clean air would be to control pollutants at their source, ventilation control is the second most effective method. Ventilation is defined in terms of air volume per minute per occupant. This is based on the assumption that most of the contaminants in a given area come from the occupants. It is expressed as room Air Changes per Hour (ACH). Peak ventilation efficiency is achieved at 12-15 ACH. For existing facilities, >6 ACH is considered acceptable. For newly constructed or renovated facilities, >12 ACH should be targeted.\(^{101}\)

17. Does the facility’s HVAC systems utilize filtration devices?

_____ Yes

_____ No

*If you answered yes, proceed to questions 17a-17b; otherwise, go to question 18.*

17a. What kind of filtration devices are currently installed in the hospital?

_____ Fixed High Efficiency Particulate Air (HEPA) filters

_____ Portable HEPA filters

_____ Others, specify: ________________________

17b. What type of frame, if any, was used for the filters?

_____ None

_____ Metal

_____ Wood

_____ Plastic

_____ Fiberglass

_____ Others, specify: ________________________

18. Are Ultraviolet Germicidal Irradiation (UVGI) devices installed in the health facility?

_____ Yes

_____ No

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\(^{100}\) See Appendix 4 for a list of common organisms associated with airborne transmission.

\(^{101}\) Sehulster et al, p. 36.
19. Do isolation units contain pressure-controlled rooms?
   _____ Yes
   _____ No

If you answered yes, proceed to questions 19a; otherwise, go to the box after 19a.

19a. Please specify the specific type of pressurization method used.
   _____ Negative room / Airborne Infection Isolation Room (AIIR)
   _____ Variable pressure room
   _____ Others, specify: ________________________________________

Ventilation control can be achieved by the following methods:102
   a. Filtration. High Efficiency Particulate Air (HEPA) Filters provide at least
      99.97% efficiency in removing particles > 0.3 microns. These are usually
      fixed into HVAC systems. Portable HEPA units (filter air at 300-800
      ft³/min) may be used to augment systems, but do not fulfill fresh air
      requirements on their own. In securing the filters, metal frames are
      preferred over wooden frames as the latter can facilitate the growth of
      fungi and bacteria.

   b. Ultraviolet Germicidal Irradiation (UVGI). This method prevents or limits
      growth of vegetative bacteria and fungi. However, it is recommended as
      a supplemental measure only. It is not a substitute for HEPA filters, local
      exhaust, or negative pressure.

   c. Pressurization. Airborne Infection Isolation Rooms (AIIR’s) are set at a
      negative pressure in relation to the corridor.103 Hence, air circulates from
      the cleanest area (i.e. nurses’ station) to the least clean (i.e. patient’s
      room). Variable pressure rooms, where pressure can be manually shifted
      from positive to negative, are no longer recommended due to inherent
      difficulties in assuring a consistently proper pressure differential.

20. When was the present ventilation system installed? _________

21. Does the ventilation system undergo regular inspection?
   _____ Yes
   _____ No

If you answered yes, proceed to questions 21a-21d; otherwise, go to question 22.

21a. When was the last formal inspection / maintenance check? _________

21b. How long has it been since the time of installation or last formal
     inspection? ___________

102 Sehulster et al, pp. 15-18.
103 See Appendix 5 for Engineered Specifications for Negative Pressure Rooms.
21c. According to manufacturer’s specifications, how often should maintenance be done? _______________

21d. Who carries out the regular inspection of the ventilation system?
   ____ Manufacturer
   ____ Facility Administrator (Please specify) _________________
   ____ Government contractor
   ____ Private contractor
   ____ Others, specify: _______________________

If the facility has pressure-controlled rooms, answer the next question. Otherwise, proceed to the box after 22a.

22. Are pressure differentials constantly monitored for accuracy?
   ____ Yes
   ____ No

If you answered yes, go to question 22a; otherwise, go to the box after the question.

22a. What indicators are used to determine the direction of air stream?
   (Please check all applicable answers.)
   ____ Qualitative
   ____ Flutter strips
   ____ Ping-pong balls
   ____ Others, specify: _________________________________
   ____ Quantitative
   ____ Manometer tests
   ____ Others, specify: _________________________________

Ventilation systems require regular monitoring and replacement in accordance with manufacturers’ recommendations. The following are areas that need regular maintenance:

   a. Determination of pressure differentials. Qualitative indicators include placing flutter strips / ping-pong balls at the room’s entry point to determine direction of air stream. Manometer tests for positive and negative pressure areas can also be used.

   b. Inspection of system filters and ducts. Insulation can trap contaminants. Ducts should always be free from bird droppings. Excess humidity and moisture should be limited.

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104 Sehulster et al, p. 20.
23. Are alternative generators available in order to avoid disruption of ventilation control during a power outage?
   _____ Yes
   _____ No

If you answered yes, go to question 23a-23b otherwise, go to the box after 23b.

23a. How long does it take before the alternative power source engages?
   ______________________

23b. How long does the back-up power last? ____________

Ideally, alternative generators that will engage within 10 seconds of loss of main power should be available in order to minimize disruption of ventilation control.105

24. In your facility, the following procedures would entail movement / transport of infected patients out of the isolation areas: (Please check all applicable answers.)
   _____ Radiologic procedures
   _____ X-ray
   _____ Ultrasound
   _____ CT / MRI
   _____ Minor procedures
   _____ Thoracentesis
   _____ Paracentesis
   _____ Central line insertion
   _____ Venous cutdowns
   _____ Intubation
   _____ Suctioning
   _____ Major procedures
   _____ Chest tube insertions
   _____ Major operations (e.g. thoracotomies, laparatomies, etc.)

25. How many of the following are available for the sole use of infected patients in your health facility?

<table>
<thead>
<tr>
<th>Provision</th>
<th>No. of Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trolleys</td>
<td></td>
</tr>
<tr>
<td>Wheelchairs</td>
<td></td>
</tr>
<tr>
<td>Disposable linen</td>
<td></td>
</tr>
</tbody>
</table>

26. In the event that infected patients have to be transported,
26a. Are there elevator/lifts reserved for these patients?
   _____ Yes
   _____ No

26b. Are there dedicated corridors that will allow these patients to access services as necessary?
   _____ Yes
   _____ No

26c. Are the receiving staff given ample notice prior to any transport / movement?
   _____ Yes
   _____ No

Movement and transport of infected patients should be kept to a minimum. Trolleys / wheelchairs with disposable linen should be used. Corridors and elevators solely for the use of these patients should be designated.\(^\text{106}\)

B. Functional Assessment

Standard precautions are designed to decrease the risk of transmission of microorganisms from both recognized and unrecognized sources of infection. These apply to blood, all body fluids except sweat, non-intact skin, and mucous membranes.\(^\text{107}\)

During the recent SARS epidemic, unprotected exposure to unrecognized cases resulted in significant transmission in health care facilities.\(^\text{108}\)

27. Are the following Personal Protective Equipment (PPE) available in your health facility? *(Please fill up the table below.)*

<table>
<thead>
<tr>
<th>PPE</th>
<th>No. of units</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disposable particulate respirators (N95 or higher)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal air-purifying respiratory hoods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eye protection devices</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Face shields</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disposable gloves</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disposable long-sleeved gowns</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


\(^{107}\) Garner et al, p. 9.

28. Are the following materials used for cleaning possibly infected surfaces readily available in your health facility? *(Please fill in the table below.)*

<table>
<thead>
<tr>
<th>Equipment</th>
<th>No. of units</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol-impregnated wipes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antiseptic hand cleansers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antiseptic surface cleansers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

29. Does the health facility have an adequate supply of surgical masks for all incoming patients with respiratory symptoms?
   ____ Yes
   ____ No

30. In the event of an increased demand for supplies, is there a contingency plan in place for both government and private sourcing?
   ____ Yes
   ____ No

   *If you answered yes, go to question 30a; otherwise, proceed to the box after the question.*

30a. Who oversees the adequacy of PPE for the entire facility? ____________

Health care facilities must have an adequate supply of Personal Protective Equipment (PPE) which include, but are not limited to, hand hygiene supplies, disposable particulate respirators (N95 or higher), disposable gloves, personal air-purifying respiratory (PAPR) hoods and power packs (if applicable), eye protection devices, face shields, surgical masks, and disposable long-sleeved gowns.109

For reusable equipment like stethoscopes, alcohol impregnated wipes should be readily available. Potentially contaminated surfaces need to be cleaned with phenol or its equivalent.110

Contingency plans for replenishing supplies must be developed and implemented in the event of an outbreak. Efficient coordination between government and private sourcing is necessary.

31. Which component(s) of the universal respiratory etiquette strategy is/are strictly enforced in the facility during an epidemic? *(Please check all applicable answers.)*
   ____ All patients with respiratory illness are provided with surgical masks and given instructions regarding proper use.
   ____ Hand hygiene materials are present in the evaluation areas, and all

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110 MOH Singapore, 2003, pp. 16-17.
patients and staff are encouraged to practice hand hygiene.

_____ Patients with respiratory symptoms are segregated from other patients.

_____ Health-care personnel use proper protective equipment when evaluating infected patients.

_____ In the absence of barriers, health-care personnel maintain a distance of at least one metre from possibly infected patients.

_____ Droplet precautions are consistently observed until it is determined with certainty that the patient’s respiratory illness does not require any safety measures above the standard precautions.

The initiation of a universal respiratory etiquette strategy for the facility is recommended.\footnote{111}

Handwashing before and after each patient contact is the single most important preventive measure. Gloves may decrease the risk of exposure to blood-borne pathogens, the likelihood that organisms on health-care personnel’s’ hands are transferred to the patient, and the likelihood of transferring organisms from patient to patient. However, gloving is not a replacement for handwashing due to unapparent defects and possible contamination during removal.\footnote{112}

32. Is there an established system for handling soiled linen, patient laundry, and used utensils in the facility?

_____ Yes

_____ No

Soiled linen and patient laundry can be adequately managed using hygienic and common sense storage and processing. Hot water and detergents are sufficient in cleaning used utensils.

33. How are possible cross-infections between health care personnel, visitors, and infected contacts monitored? (Please check all applicable answers.)

_____ Vigilant recording of vital signs and telltale symptoms before and after each work shift by all health-care personnel with high-risk exposure.

_____ Updated personal diary of contacts for all health-care personnel throughout the duration of the epidemic.

_____ Regular medical evaluation for all health-care personnel.

_____ Quarantine of all symptomatic health-care personnel.

_____ Availability of a venue where health-care personnel with questionable health status can direct their queries and concerns.

_____ Registration of all visitors, with full contact details.

_____ Others, specify: __________________________________________

\footnote{111} CDC, Public Health Guidance, p. 10.

\footnote{112} Garner et al, p. 9.
A comprehensive yet realistic exposure reporting process should be developed. Vigilance in health-care personnel with regard reporting any alarming physical symptoms acquired after a high risk exposure is encouraged. Each worker must keep and update a personal diary of contacts during an outbreak. All visitors should be registered, with full contact details.\textsuperscript{113}

C. Human Resources Assessment

34. Does the health facility have an Infectious Disease Central Committee that addresses all technical concerns with regard infection control in the facility during an outbreak?
   _____ Yes
   _____ No

If you answered yes, go to question 34a-34c; otherwise, proceed to the box after question 34c.

34a. Who are the members of the committee, and what is the specific role of each member? (Please fill up the table below)

<table>
<thead>
<tr>
<th>Member</th>
<th>Department</th>
<th>Specific Role</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

34b. How often do the committee members meet?

Prior to an outbreak ______________________

During an outbreak ______________________

34c. Does the committee enlist the help of outside institutions and experts for technical concerns when necessary?
   _____ Yes
   _____ No

\textsuperscript{113} MOH Singapore, p. 13.
All health care facilities must have a designated infection control team available that will formulate and enforce infection control procedures. The roles and responsibilities of each member of the team, including all hospital officials, should be clearly defined.114

It is highly recommended that representatives from the following groups be included in the committee: administration/senior management, section of infectious disease, hospital disaster coordinator, engineering/physical plant, nursing administration, medical staff including out-patient areas, intensive care unit, emergency department, laboratory services, housekeeping department, public relations, security, materials management, diagnostic imaging department, staff education/development department.115

In the recent SARS epidemic, a disproportionate rate of transmission was noted in health care settings among health-care personnel. This phenomenon can be attributed to the personnel’s frequent exposure to patients, their secretions, and the contaminated environment.116

Because of this risk, appropriate measures should be instituted in order to guarantee that all health-care personnel will be sufficiently protected.

35. Does the health facility conduct training on disease outbreak preparedness for its personnel?
   _____ Yes
   _____ No

   If you answered yes, go to question 35a-35d; otherwise, proceed to the box after question 35d.

   35a. Who is/are the intended audience of the training program? (Please check the most appropriate option.)
       _____ Medical personnel
       _____ Non-medical personnel
       _____ All personnel who are possibly exposed to infected patients
       _____ Others, specify: ________________________________________

   35b. Is the training program a prerequisite prior to a health worker’s assignment to his/her area of responsibility?
       _____ Yes
       _____ No

   35c. How often is the training program given? ____________________________

35d. What knowledge items are covered by the training program on disease outbreak preparedness? *(Please check all applicable answers.)*

- [ ] Basic and essential knowledge on the infectious disease in question
- [ ] Major components of the health facility’s formal written plan of action on epidemics
- [ ] Standard precautions
- [ ] Airborne precautions (including universal respiratory etiquette strategy)
- [ ] Others, specify: ________________________________

Adequate training regarding standard operating procedures during an epidemic is compulsory for all health-care personnel (refers to all workers, medical and non-medical, in a health care facility who work with affected patients). Core components of the training program include knowledge of the particular disease in question, the facility’s formal plan of action, and basic health care infection control principles.\(^{117}\)

36. What kind of medical evaluations, if any, are given to health-care personnel in your health facility? *(Please check all applicable answers)*

- [ ] Pre-employment
- [ ] Periodic *(Please state frequency)* ________________________________
- [ ] Post-exposure
- [ ] As-needed basis
- [ ] None

37. Are vaccines made available for health-care personnel with possible high-risk exposures?

- [ ] Yes
- [ ] No

*If you answered yes, go to question 37a-37b; otherwise, proceed question 38.*

37a. Which vaccines are made available for health workers in your health facility? *(Please place a check mark in the appropriate space)*

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Available, without fee</th>
<th>Available, with fee</th>
<th>Not available</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varicella</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influenza</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polyvalent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetanus Toxoid</td>
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</tbody>
</table>

\(^{117}\) MOH Singapore, p. 15.
37b. Are health workers constantly followed-up for appropriate booster doses?  
   _____ Yes  
   _____ No  

38 Does the health facility maintain an updated database of medical records of its health-care personnel?  
   _____ Yes  
   _____ No  

If you answered yes, go to question 38a-38b; otherwise, proceed to the box after question 38b.

38a. What information regarding personnel is/are contained within the database? *(Please check all applicable answers.)*  
   _____ Past Medical History  
   _____ Immunization Status  
   _____ High Risk Exposures  
   _____ Post-exposure Prophylaxis  
   _____ Work-related injuries  
   _____ Others, specify: ____________________________________________

38b. Who has access to personnel health records? *(Please check all that apply)*  
   _____ Health worker in question  
   _____ Hospital Director  
   _____ Direct Supervisor  
   _____ Human Resources Department Official  
   _____ Health Facility Infectious Disease Central Committee  
   _____ Others, specify: ____________________________________________

Medical evaluations should be made available for all health-care personnel.
Individual risk factors for each worker are determined prior to placement, including immunization status and medical histories. Periodic evaluations and updating of records are necessary. Individualized health counseling should supplement medical evaluations.

Immunization of health-care personnel with constant high risk exposures is an essential component of preventive services. The choice of vaccines depends on: a) likelihood of personnel exposure, b) nature of employment, c) characteristics of the present patient population.

Efficient monitoring of personnel health status is of utmost importance. These records include an updated database of medical evaluations, immunizations, exposures, and post-exposure prophylaxis (if applicable). Information contained in the medical records of health-care personnel should be kept confidential.118

39. Does the health facility have the capacity to investigate all reports of high risk exposures by health-care personnel?
   _____ Yes
   _____ No

40. Do different departments in the facility coordinate with a central committee in order to facilitate exposure surveillance and post-exposure treatment?
   _____ Yes
   _____ No

Health care facilities are responsible for managing job-related illnesses and exposures. Decisions on work-related disease transmission are based on the mode of transmission and epidemiology of the disease, and will thus ultimately determine the work restrictions that will be imposed. Coordination between all involved departments will ensure efficient surveillance and provision of preventive services.119

41. In the event of an epidemic, are health-care personnel divided into multiple task-independent yet coordinating teams?
   _____ Yes
   _____ No

   If you answered yes, go to question 41a-41c; otherwise, proceed to question 42.

41a. Are high-risk tasks distributed to different teams in order to minimize

119 Bolyard et al, p. 295.
high-risk exposures for individual personnel?
  ____ Yes
  ____ No

41b. Does your setup prevent any unnecessary interactions between personnel of various departments with different responsibilities?
  ____ Yes
  ____ No

41c. Please outline the organization of health-care personnel in your facility during an infectious disease outbreak.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Assigned Area</th>
<th>Specific Task(s)</th>
</tr>
</thead>
</table>
| Team 1    | 1.  
           | 2. 
           | 3. 
           | 4. 
           | 5. |
| Team      | 1.  
           | 2. 
           | 3. 
           | 4. 
           | 5. |
| Team      | 1.  
           | 2. 
           | 3. 
           | 4. 
           | 5. |

42. Are health-care personnel discouraged from interacting with workers from other health facilities throughout the duration of an epidemic?
  ____ Yes
  ____ No

43. Does the facility temporarily close all shared common areas for personnel (e.g. coffee lounges) during an epidemic as a precautionary measure?
  ____ Yes
  ____ No
In order to minimize the disruption of services, breach of infection control procedures, and cross-infectivity between personnel, a modular system of service provision and staff deployment is recommended. Services are divided into self-contained units with minimal contact between other units. The number of staff-staff and staff-patient contacts should be minimized. Moreover, the number of procedures and encounters by different team members for one patient should be as low as possible. There should be minimal contact between health-care personnel of different facilities during an outbreak.

Special precautions should be observed regarding areas with common usage. Temporary closure of all common staff facilities is prudent.\textsuperscript{120}

44. Which of the following groups can your health facility utilize in the event of a staffing shortage during an infectious disease outbreak? \textit{(Please check all applicable answers.)}

- _____ Retired health-care personnel previously affiliated with the facility
- _____ Other personnel in the facility, previously with non-health-related responsibilities
- _____ Health-care Trainees
- _____ Volunteers
- _____ Others _______________________________________

45. What is the average length of each health-care worker’s work day? ______

45a. On the average, how many hours during a shift does each worker spend using PPE’s? __________________

As an outbreak progresses, staffing shortage may escalate. The existing personnel can be augmented by competent retired health-care personnel, non-health-care personnel within the facility, and volunteers. During an outbreak, increasing the size of the staff may be considered in order to facilitate PPE-free time for each worker.\textsuperscript{121}

46. Does the health facility have the means of communicating with concerned government agencies and public information systems during an epidemic?

- _____ Yes
- _____ No

47. Is there a Liaison Officer in your health facility who monitors the status of infectious disease outbreaks in both the facility and the community?

- _____ Yes
- _____ No

\textsuperscript{120} MOH Singapore, p. 21

\textsuperscript{121} www.cdc.gov/ncidod/sars, 2003.
48. Does the health facility ensure that, prior to discharge, every infected patient with resolved symptoms can be adequately followed-up?

_____ Yes

_____ No

An epidemic entails a rapid analysis of the status of patients and possible transmission among personnel in a health care facility. This information should be made known to the government and the general public. A working network with the health department facilitates regular updates on the status of the epidemic in the community and the health care facility.

Appropriate follow-up and management in the community of patients who were discharged after clinical improvement, can be facilitated by a working agreement between the health care facility administration and community officials.\(^ {122}\)

\(^ {122}\) Ibid.
III. Assessment of Biological, Chemical, and Radiologic Emergency Preparedness

Standards of armed conflict parallel advances in science and technology. Unfortunately, increasingly efficient weapons of mass destruction translate into an increased number of casualties during a single attack. Recent events, like the 1995 sarin nerve gas attack in a Tokyo subway station, have demonstrated that the threat from the intentional use of biological, chemical, and/or radiologic agents extend into supposed times of peace. As information becomes readily accessible globally, the capacity of intentionally utilizing these agents is already within the reach of common citizens with sufficient malicious intent. Unforeseen accidents in institutions utilizing chemical and radiologic technologies, moreover, add to the prevailing threat faced by the global community. The uncertainties involved in mass casualties due to both the intentional and unintentional agents of mass destruction impose a formidable challenge for both the community and its health facilities. In such incidents, health facilities have to be prepared for the difficult task of responding to a sustained and increased demand for health services.

This section discusses salient general points regarding a health facility’s response to mass casualties secondary to biological, chemical, and radiologic emergencies. Several details on isolation procedures for biological agents have been clarified in the previous section. The document will not delve into specific aspects of every agent, as there are other manuals designed for this purpose.

A. Infrastructure Assessment

As increasing numbers of casualties rush to the health facility, the risk of contaminating equipment, staff, and other patients also increase. Because of this, there is a need for health facilities to establish a reception area that is separate from the main treatment facility. A contamination-free facility ensures that maximal medical care can be given to the critically injured and ill.

49. During a mass casualty incident, does the health facility have the capacity to establish a temporary reception area for incoming patients?

____ Yes
____ No

If you answered yes, go to questions 49a-49h; otherwise, proceed to the box after question 49h.

49a. Where will the temporary reception area be located? (Please check the most appropriate response.)

____ Within the existing emergency room
____ Within the hospital compound, but outside the emergency room
Outside the hospital compound
Others, specify: ________________________________

49b. How large is the space available for the reception area? (Please state in square meters.) __________________

49c. Which of the following are present in the reception area? (Please check all applicable answers.)
   ___ Arrival point
   ___ Triage area
   ___ Emergency treatment area
   ___ Decontamination area
   ___ “Hot Line”
   ___ Others, specify: ________________________________

49d. How far is the temporary reception area from the main treatment facility? (Please state in meters) _________________

49e. Is the reception area: (Please check one)
   ___ Upwind? ___ Downwind?

49f. How many pathways lead into or out of the reception area? (Please check the most appropriate response)
   ___ One: for both ingress and egress
   ___ Two: one for ingress, one for egress
   ___ Four: separate points of ingress and egress for patients and staff
   ___ Others, specify: ________________________________

49g. Are pathways and perimeters clearly marked?
   ___ Yes
   ___ No

49h. Do vehicles entering and leaving the site have their own point of access?
   ___ Yes
   ___ No
Mass casualty reception areas, managed by a triage officer and augmented personnel, have the following components:¹²³

a. **Arrival point** – Serves as the entrance to the reception area.

b. **Triage area** – Patients are assigned to one of three categories, namely, *Immediate, Minimal,* or *Delayed Care.*

c. **Emergency treatment area** – Immediate, limited medical care is given according to individual need.

d. **Decontamination area** – Offending agents are removed according to standard recommendations.

e. **“Hot line”** – Separates the contaminated from the non-contaminated areas.

---

### Components of a Reception Area:¹²⁴

- **Arrival Point**
- **Triage Area**
- **Decontamination Area**
- **Emergency Treatment Area**

---

Ideally, the temporary reception area set up by a health facility should be walking distance and downwind from the main treatment facility. After an incident, the facility “locks down,” with only two entrances available: one for staff and one for incoming patients. Routes for both patient ingress and egress should be designated and clearly marked. Vehicles coming from affected areas are considered contaminated and access the vicinity of the facility through a separate entry/exit point.¹²⁵

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¹²⁴ Figure adapted from UAMRICD, p. 265.

¹²⁵ Smith et al, *Interim Guidelines for Hospital Response to Mass Casualties from a Radiologic Incident,* (Division of Environmental Hazards and Health Effects National Center for Environmental Health, CDC), 2003, p. 55.
50. Does the health facility have pre-arranged formal agreements with other facilities in the community that cover transfer procedures in the event that the hospital can no longer accommodate the influx of patients?

____ Yes (Please fill in table below)
____ No

<table>
<thead>
<tr>
<th>Health Facility</th>
<th>Contact Number</th>
<th>Liaison Officer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In reality, health facilities will have little or no advanced notification of incoming patients. During a mass casualty incident, space should be reserved for the most critically ill and injured. If the facility can no longer accommodate incoming patients, transfer to other health facilities should be expedited according to pre-arranged formal agreements. The discharge of non-critical patients who were in the hospital prior to the incident should be facilitated.126

51. Do patients going through the reception area get triaged to the proper level of care according to their particular needs?

____ Yes
____ No

Patients who are classified as requiring immediate care are immediately brought to the emergency treatment area. Those who need minimal care are referred to the emergency treatment area or the decontamination site, according to each patient’s particular need. Those identified as delayed care cases are sent to the decontamination area, while those deemed stable and labeled as expectant may be set aside and re-evaluated at a later time.127

52. What procedures are expected to be performed in the emergency treatment area? (Please check all applicable answers.)

____ Venoclysis
____ Loading IV therapy
____ Minor Suturing
____ Resuscitation
____ Repair of any defects in protective garments
____ Initial decontamination
____ Others, specify: ____________________________________________

126 Smith et al, p. 53.
127 UAMRICD, p. 196. Note: should this read US Army Medical Research Institute of Chemical Defense? (USAMRICD)
In the emergency treatment area, patients in need of immediate care are stabilized to the point that they can survive for around 20-30 minutes without further care, prior to transfer to the decontamination site and the main treatment facility. Time spent by patients in this area is limited, and procedures should be confined to venoclysis, loading IV therapy, and minor suturing. Here, any violations in the protective garments are addressed. Wounds and surrounding skin are flushed with decontaminating solutions.

53. How far is the decontamination area from the main treatment facility? (Please state in meters.) ________________

54. Is the decontamination area downwind in relation to the main treatment facility?
   _____ Yes
   _____ No

55. Is the decontamination area upwind from the arrival point and triage area?
   _____ Yes
   _____ No

56. Can the location of the decontamination area be easily transferred according to prevailing winds at any given moment?
   _____ Yes
   _____ No

57. Is the site of the decontamination area big enough to maintain a distance of 75 meters between the decontamination facilities and any contaminated areas?
   _____ Yes
   _____ No

58. Can the perimeter of the reception area be adequately secured against possible external attack?
   _____ Yes
   _____ No

59. Is the main treatment facility accessible by any other route that bypasses the temporary reception area?
   _____ Yes
   _____ No

---

128 UAMRICD, p. 197. . Note: should this read US Army Medical Research Institute of Chemical Defense? (USAMRICD)
The decontamination sites should be at least 45 meters downwind from the main treatment facility and upwind from the arrival point and triage area. Separate areas may be designated for ambulatory and stretcher-borne patients. Ideally, sites should be amenable to swift re-deployment, in the event that wind direction shifts more than 45 degrees. In case the sites are moved, a distance of more than 75 meters upwind from any contaminated area is desirable. Provisions for added security from possible attack must be made available since these sites serve as the only entry points to the “hot line” and into the main facility.\(^\text{129}\)

The most important decontamination process during a biologic, chemical, or radiologic emergency is done within the first minutes after exposure to the offending agent. In most cases, timely physical removal of the agent is more important than chemical means.\(^\text{130}\)

As much as possible, decontamination should not interfere with the medical care of patients with life-threatening conditions.\(^\text{131}\)

60. Which of the following decontamination methods can your health facility employ during a mass casualty incident? (Please check all applicable answers.)

- Physical decontamination
- Flushing with water and aqueous solutions
- Adsorbent materials (Please specify)
- M291 (Polystyrene Polymeric + ion exchange resins)
- Others, specify: ____________________________

- Chemical decontamination
- Soap wash
- Hypochlorite solutions
- Neutralizing agents (Please specify)
- Others, specify: ____________________________

61. Is there an alternative water source that the hospital can use for decontamination in order to supplement the present water supply during a sudden increase in demand?

- Yes (Please specify) ____________________________
- No

62. Does the health facility have a contingency plan in place for quickly replenishing its stock of decontamination solutions during a mass casualty incident?

- Yes
- No

\(^{129}\) UAMRICD, p. 246. Note: should this read US Army Medical Research Institute of Chemical Defense? (USAMRICD)

\(^{130}\) USAMRICD, p. 175. Note: should this read US Army Medical Research Institute of Chemical Defense? (USAMRICD)

\(^{131}\) Smith et al, p. 56.
Physical removal is effective against most chemical contaminating agents regardless of structure.\textsuperscript{132} It involves the following processes:

\begin{itemize}
  \item \textit{Flushing with water and aqueous solutions}.
  \item \textit{Use of adsorbent materials} – Advocated in some NATO nations. Involves the use of dry powders like soap detergent, followed by wiping with wet tissue paper.
  \item \textit{M291 (Polystyrene Polymeric + ion exchange resins)} - Currently used by American forces on the battlefield. Consists of a wallet-sized carrying pouch with individual packets. Each packet can be used on the skin on the face and around wounds.
\end{itemize}

Chemical decontamination, on the other hand, consists of the following:

\begin{itemize}
  \item \textit{Soap wash} – Works via mechanical force and slow hydrolysis. Both fresh and sea water may be used.
  \item \textit{Oxidation / Hydrolysis} – The ideal skin decontaminant is safe to use, easy to apply, readily available, able to neutralize most agents, stable in long-term storage, affordable, hypoallergenic, and easily disposed. Moreover, it should have a rapid onset of action, and not produce toxic end products nor enhance absorption of the offending agent. Usually, hypochlorite solutions act universally against organophosphorus and mustard agents. A 0.5% sodium or calcium hypochlorite solution is used for the skin, while 5% solution is used for contaminated equipment. The solutions should not be used for the eyes or in open wounds.\textsuperscript{133}
\end{itemize}

63. Are there skilled technicians in the health facility who can conduct rapid radiologic surveys of incoming patients and the facility itself in order to detect possibly harmful radiologic contamination?

\begin{tabular}{ll}
  Yes & \hspace{1cm} No \\
  \hline
\end{tabular}

64. In the event of a radiologic incident, does the hospital have the means to handle contaminated casualties and equipment in accordance with accepted guidelines?

\begin{tabular}{ll}
  Yes & \hspace{1cm} No \\
  \hline
\end{tabular}

65. Does the health facility have adequate stocks of the following supplies that are crucial during a radiologic emergency? \textit{(Please check all that apply and indicate the number of units in the parenthesis after each blank.)}

\begin{tabular}{ll}
  \hspace{1cm} & Intravenous therapy kits \\
  \hspace{1cm} & Intravenous fluids \\
  \hspace{1cm} & Anti-diarrheals \\
  \hspace{1cm} & Anti-emetics \\
  \hspace{1cm} & Potassium iodide
\end{tabular}

\textsuperscript{132} See Appendix 6 for a list of Common Agents Used in Chemical Warfare.
\textsuperscript{133} USAMRICD, p. 175.
Upon arrival at the health facility’s reception area, victims of radiologic incidents undergo a radiologic survey conducted by a trained technician using a standard measuring device. Patients are then decontaminated using water and soap. A resurvey is done after the wash, with re-washing done as needed until an acceptable radiation level is attained. Any area that remains contaminated, despite standard measures, should be covered with a plastic bag or wrap. All personal belongings of the patient should be kept in tightly sealed plastic bags, properly labeled and accounted for by the triage officer. Corpses from a radiologic event may be contaminated with radioactive material and must be handled according to existing guidelines.134

Health facilities responding to radiologic emergencies should have adequate stocks of the following: IV therapy kits, IV fluids, anti-diarrheals, anti-emetics, and potassium iodide.135

66. Are germicidal cleaning agents readily available in your health facility?
   _____ Yes
   _____ No

67. Does your health facility have an efficient system for sterilizing all reusable equipment?
   _____ Yes
   _____ No

68. Does the health facility comply with accepted guidelines for disposal of contaminated single-use equipment?
   _____ Yes
   _____ No

In emergencies involving biological agents136, the method of decontamination done depends on the suspected exposure. In contrast to chemical and radiologic agents, containment of possible spread from biological agents is not an emergent issue. Most cases would require little or no decontamination at all. The main goal in treating these patients is to reduce the extent of external contamination and prevent further spread.

Germicidal cleaning agents should be readily available in patient care areas. All reusable equipment should be appropriately cleaned and reprocessed prior to use on succeeding patients. Single-use items must be appropriately discarded in accordance with local regulations.137

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135 Smith et al, p. 54.

136 See Appendix 7 for a list of Common Agents Used in Biological Warfare.

69. Does your health facility have the necessary instruments to check for possible radiologic contamination in patients, health care workers, and equipment?

____ Yes
____ No

If you answered yes, go to questions 69a-69c; otherwise, proceed to the box after question 69c.

69a. Which radiation measurement device(s) is/are available in your health facility? (Please check all that apply, and indicate the number of units within the parentheses after each blank)

____ ( ) Thermoluminiscent dosimeters
____ ( ) Self-reading dosimeters
____ ( ) Dosimeter cards
____ ( ) Geiger-Mueller counters
____ ( ) Pancake probes
____ ( ) Portable spectrometers
____ ( ) Area monitors
____ ( ) Portal monitors
____ ( ) Air monitors
____ Others (Please specify) ____________________________

69b. Does the health facility have skilled personnel who can operate the instruments?

____ Yes, How many? ____________
____ No

69c. Are the instruments checked and calibrated periodically while not in use?

____ Yes
____ No

---

During a radiologic event, the probability and severity of health effects are dependent on the radiation dose present. Thus, a facility must have instruments that can measure background and contaminant radiation. Examples of these instruments include:138

a. Thermoluminiscent dosimeter – Reusable instrument that stores radiation readings which are later read by an electric reader. Can be stockpiled and rapidly issued. However, this cannot be used as an early warning device, and thus should not be used alone by first responders.

b. Self-reading dosimeter – Easy to use. Gives a reading of total absorbed dose in real time. However, the instrument is fragile and gives erroneous readings when dropped.

c. Dosimeter card – Compact credit card-sized instrument that can be used only once. Successive dots on the card change color according to the level of radiation, giving an approximate reading. Good for emergency responders, but not for those involved in cleanup.

---

d. **Geiger-Mueller counter** – Measures alpha, beta, and gamma radiation. Instrument is directional, and is thus prone to erroneous readings when used in areas with intense radiation. Instrument needs periodic calibration.

e. **Pancake probe** – GM counter with a wide flat probe. The added fixture allows for a more rapid scan of an area. However, it is prone to erroneous readings when used in areas with intense radiation.

f. **Portable spectrometer** – Determines the specific radioisotopes present. Needed by those involved in formulating treatment for possible internal contamination.

g. **Area monitor** – Stationary device designed to continuously detect radiation over a wide area. May be connected to a data-logging device which will enable reconstruction of the extent of contamination and staff exposure.

h. **Portal monitor** – Doorway-type device that detects the presence of radiation as people pass through. Allows rapid evaluation of a large number of people.

i. **Air monitor** – Omnidirectional probe that is mounted in areas with increased risk of contamination by airborne radiation.

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**B. Functional Assessment**

70. Does your health facility have an existing system of monitoring all patient areas for signs of possible disease outbreak or bioterrorist attack?

____ Yes
____ No

*If you answered yes, go to questions 70a-70c; otherwise, proceed to the box after question 70c.*

70a. Who are the key participants in the facility’s infectious disease surveillance system? (Please check all applicable answers)

____ Infectious disease control professional / committee
____ Chief Nurse
____ Attending Physicians
____ Staff Nurses
____ Others, specify: __________________________________________________________

70b. Are the medical records of new patients with telltale signs and symptoms of a possible biologic incident immediately put on review?

____ Yes
____ No
70c. Does the facility observe close coordination with the local health department for early detection and/or reporting of possible intentional biologic incidents?

____ Yes
____ No

Maintaining a high level of vigilance leads to rapid intervention and prevention. Especially in a bioterrorist attack, early identification of a crisis situation significantly minimizes the number of casualties. A bioterrorist event should be suspected when progressively increasing numbers of otherwise healthy patients seek treatment for similar signs and symptoms. Other telltale signs include: a) patients with unusual clinical presentations coming from the same geographic area; b) increased reports of dead animals from the same area; c) significant increase in the number of patients who die within 72 hours of admission.

Frequent surveillance in the Intensive Care Units, Emergency Room, and other patient care units is vital for the early recognition of a bioterrorism event. Moreover, medical records of new patients with unusual signs and symptoms that go undiagnosed for more than 48 hours should be reviewed.\(^{139}\)

The key to a health facility’s capacity to serve the critically ill is recognizing that it is part of a community. Understanding how the facility fits into the community’s emergency plan is paramount. If there is no existing plan for mass casualty incidents, then the hospital should actively participate in the formulation of one.\(^{140}\)

71. Does the community where your health facility is located have an existing mass casualty emergency preparedness plan?

____ Yes
____ No

If you answered yes to question 71, answer questions 71a-71d.

71a. When was the plan formulated? ___________

71b. Was the health facility involved in the formulation of the plan?

____ Yes
____ No

71c. When was the plan last updated? ___________

\(^{140}\) Smith et al, p. 80.
71d. Does the health facility have a representative in the committee that oversees the periodic review of the emergency plan?

_____ Yes (Please specify the name of the representative.)

_____ No

*If you answered no to question 71, answer question 71e.*

71e. Does the health facility have a representative in the community’s health committee who can facilitate the formulation of a mass casualty emergency preparedness plan?

_____ Yes (Please specify the name of the representative.)

_____ No

72. Does your facility participate in community-wide emergency drills?

_____ Yes

_____ No

73. In the event of a mass casualty incident secondary to biologic, chemical, or radiologic agents, what subset of patients can your facility accommodate? *(Please check the most applicable response.)*

_____ Exposed patients only

_____ Unexposed patients only

_____ Both exposed and unexposed patients

_____ The subset of patients has not been determined in the hospital’s emergency plan

Preparedness of health facilities for mass casualty incidents should extend into involvement with community-wide initiatives and participation in community drills. Additional protection of the community may be achieved by designating some hospitals for casualties and others for those who are unexposed only.\(^{141}\)

```
The usual communication systems used in the health facility and the community can easily be overwhelmed during a mass casualty incident. Back-up systems have to be developed, tested, and drilled.\(^{142}\)
```

74. Which communication devices can the health facility utilize during a mass casualty incident? *(Please fill in the table below.)*

<table>
<thead>
<tr>
<th>Communication Device</th>
<th>Number of Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular telephones</td>
<td></td>
</tr>
<tr>
<td>Cellular phones</td>
<td></td>
</tr>
</tbody>
</table>


\(^{142}\) AHA, *Hospital Preparedness*, 2000.
Fax machines
Short wave radios
Internet consoles

75. Are there back-up communication systems in place?
   ____ Yes (Please specify) ________________________________
   ____ No

The community will depend on health facilities for updates about ongoing mass casualty incidents. However, to minimize the provision of medical services, press and media briefings should be regularly scheduled away from the hospitals by a knowledgeable representative of the facility together with leaders of the community.  

76. Does the health facility have an assigned representative who coordinates with the press and media during a mass casualty incident?
   ____ Yes (Please specify the name of the representative.)
   ____ No

C. Human Resources Assessment

77. In addition to the standard PPE enumerated in the previous section of the manual, are the following items readily available in your health facility?  
   (Please fill in the table below.)

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Number of Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disposable shoe coverings</td>
<td></td>
</tr>
<tr>
<td>Standard issue chemical protective masks</td>
<td></td>
</tr>
<tr>
<td>Standard issue MOPP-4 suits</td>
<td></td>
</tr>
<tr>
<td>Rubber gloves</td>
<td></td>
</tr>
<tr>
<td>Rubber aprons</td>
<td></td>
</tr>
</tbody>
</table>

78. Which of the following materials are readily available for use by the facility's health care workers?  
   (Please check all applicable answers.)
   ____ Plastic wrap
   ____ Plastic bags
   ____ Plain paper for the floors
   ____ Personal dosimeters for heavily exposed personnel
   ____ Others, specify: ________________________________
Aside from the Personnel Protective Equipment (PPE) enumerated in the previous section, the following items will provide additional protection for health care workers against contamination by offending agents:

a. Disposable shoe coverings
b. Standard issue protective masks
c. Standard issue MOPP-4 suits (chemical protective over-garments)

Moreover, the following should be readily available for personnel use: plastic wrap to cover and protect equipment, butcher paper or its equivalent to cover the floors, and personal dosimeters for personnel who have frequent contact with contaminated patients.\textsuperscript{144,145}

Most of the agents that are likely to be used in a bioterrorist attack are not transmitted from person-to-person. Patients may be managed using Standard Precautions since re-aerosolization is unlikely.\textsuperscript{146}

Chemical agents rarely pose a vapor hazard. Thus, chemical protective masks for personnel are not absolutely necessary. However, foreign bodies that have been introduced into wounds may sequester the chemical, leading to retarded release that can be harmful to the patient and personnel. The use of well-fitting rubber gloves is recommended.\textsuperscript{147} (USAMRICD, p. 220)

79. Are the health care workers in the facility required to wear photo identification cards while on duty?
   _____ Yes
   _____ No

80. Can the health facility rapidly issue standard identification cards to reserve staff and volunteers during a mass casualty incident?
   _____ Yes
   _____ No

During a mass casualty incident, the hospital itself, together with its staff, may be a target for attacks. Thus, security plans should include provision of photo identification cards to all authorized personnel. Public safety personnel (i.e. military and police) must be briefed beforehand regarding the characteristics of authentic ID cards for every health facility in the community. Reserve staff and official volunteers can be issued specially coded ID cards so that officials can readily identify those who are authorized to cross any restricted perimeters.\textsuperscript{148}

\textsuperscript{145} Smith et al, p. 61.
\textsuperscript{146} APIC, p. 7.
\textsuperscript{147} USAMRICD, p. 220.
\textsuperscript{148} CDHS, p. 10.
81. During mass casualty incidents, does the health facility allow physicians who are not regular members of its medical staff to admit and attend to victims?
   ____ Yes
   ____ No

82. Does the health facility have a contingency plan for maximizing and augmenting its work force during a mass casualty incident?
   ____ Yes
   ____ No

The capacity of a health facility to respond to mass casualty incidents is better measured by the availability of sufficient numbers of trained staff, rather than the facility’s total bed capacity. Various health facilities must coordinate with each other in order to ensure that increased demand for medical services can be matched with augmentation of health care staff. During disaster situations, hospitals in the community may follow a policy of recognition of temporary privileges for all physicians. This will allow physicians to attend to patients who are admitted in a facility regardless of whether the former is a member of the facility’s medical staff. The community’s “first responders” (e.g. firemen, policemen, etc.) are potential sources for additional staff. Each facility must develop contingency plans in case medical professionals and volunteers do not show up.  

83. Does the health facility provide regular training regarding biological, chemical, and radiologic incidents for its health care workers?
   ____ Yes
   ____ No

   *If you answered yes, go to question 83a; otherwise, proceed to question 84.*

83a. What components are included in the training program? *(Please check all applicable answers.)*
   _____ Universal Precautions
   _____ Health Facility Emergency Plan
   _____ Decontamination Procedures
   _____ Specific roles during a mass casualty incident
   _____ Maintenance of physical and psychological well-being during a mass casualty incident
   _____ Others, specify: ____________________________________________

84. Does the health facility conduct regular emergency preparedness drills?
   ____ Yes
   ____ No

   *If you answered yes, go to questions 84a-84b; otherwise, proceed to the box after question 84b.*

84a. How frequent does the facility hold the drills? ______________

84b. Is the health facility’s emergency plan modified according to the results of the drills?
   ____ Yes
   ____ No

Ideally, health facilities should conduct two emergency preparedness drills per year. The drills provide training exercises as well as underline previously unidentified shortcomings of the existing plan. The specific role of each healthcare worker during an emergency situation should be elucidated during the drills.  

Summary

There is no such thing as absolute preparedness, only various levels of unpreparedness. It should be kept in mind that occurrences regarded as “disasters” (earthquake, typhoon, volcanic eruption, war, etc.) are really hazards that transform a vulnerable condition into a disaster. Therefore, a reduction in vulnerabilities would result in reduction of the impact of hazards. Identification of vulnerable areas is the first step in this process. Hopefully, this was achieved by patiently going through all the parts of this protocol. Results that were obtained from this endeavor must then be analyzed by the emergency planning group and appropriate actions taken.

The protocol attempted to expose all possible areas of vulnerability in a health facility. Unlike most of the previously published disaster-related materials, a little more emphasis was placed on matters involving the assessment of the structural integrity of the building/s and other significant architectural issues. These are frequently forgotten topics whenever health facilities outline their preparedness plans. Bearing in mind the role of health facilities as ‘life-line’ buildings, the importance that these health facilities remain structurally and functionally operational when disaster strikes cannot be overemphasized.

In the past, the existence of a written plan was the only measure of disaster preparedness. It is now advocated that pre-disaster planning should include clarification of gray areas of responsibility and the identification of unusual or exceptional tasks, resources and procedures. Preparedness is improved by anticipating and solving potential problems. And it is a never-ending task.

150 AHA, Hospital Preparedness, 2000.
153 Poncelet and Goyet, p. 197.
Appendices

APPENDIX 1: The New Emergency Health Kit\textsuperscript{154}

The New Emergency Health Kit is designed to meet the needs of the population with disrupted medical facilities in the second phase of a disaster, or of a displaced population without medical facilities. It is not intended for the acute phase response. The kit is composed of two different sets of medicines and medical supplies: a \textit{BASIC UNIT} and a \textit{SUPPLEMENTARY UNIT}.

Basic Unit

The basic unit is intended for use by basic health workers and contains estimated provisions for a population of 1,000 persons for 3 months. The contents of the basic unit are as follows:

<table>
<thead>
<tr>
<th>Medicines</th>
<th>unit</th>
<th>no. of units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetylsalicylic acid, tab 300 mg</td>
<td>tab</td>
<td>3000</td>
</tr>
<tr>
<td>Aluminum hydroxide, tab 500 mg</td>
<td>tab</td>
<td>1000</td>
</tr>
<tr>
<td>Benzyl benzoate, lotion 25%</td>
<td>1 liter bottle</td>
<td>1</td>
</tr>
<tr>
<td>Chlorhexidine (5%)</td>
<td>1 liter bottle</td>
<td>1</td>
</tr>
<tr>
<td>Chloroquine, tab 150 mg base</td>
<td>tab</td>
<td>2000</td>
</tr>
<tr>
<td>Ferrous sulfate + folic acid, tab 200 + 0.25 mg</td>
<td>tab</td>
<td>2000</td>
</tr>
<tr>
<td>Gentian violet, powder</td>
<td>25 g</td>
<td>4</td>
</tr>
<tr>
<td>Mebendazole, tab 100 mg</td>
<td>tab</td>
<td>500</td>
</tr>
<tr>
<td>ORS (oral rehydration salts)</td>
<td>sachet for 1 liter</td>
<td>200</td>
</tr>
<tr>
<td>Paracetamol, tab 100 mg</td>
<td>tab</td>
<td>1000</td>
</tr>
<tr>
<td>Sulfamethoxazole + trimethoprim, tab 400 + 80 mg</td>
<td>tab</td>
<td>2000</td>
</tr>
<tr>
<td>Tetracycline eye ointment 1%</td>
<td>tube 5 g</td>
<td>50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Renewable supplies</th>
<th>unit</th>
<th>no. of units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absorbent cotton wool</td>
<td>kg</td>
<td>1</td>
</tr>
<tr>
<td>Adhesive tape, 2.5 cm x 5 m</td>
<td>roll</td>
<td>30</td>
</tr>
<tr>
<td>Bar of soap (100-200g)</td>
<td>bar</td>
<td>10</td>
</tr>
<tr>
<td>Elastic bandage (crepe) 7.5 cm x 5 m</td>
<td>unit</td>
<td>20</td>
</tr>
<tr>
<td>Gauze bandage with selvedge, 7.5 cm x 5 m</td>
<td>roll</td>
<td>200</td>
</tr>
<tr>
<td>Gauze compresses 10 x 10 cm, 12 ply</td>
<td>unit</td>
<td>500</td>
</tr>
<tr>
<td>Ball pen blue or black</td>
<td>unit</td>
<td>10</td>
</tr>
<tr>
<td>Exercise book., A4, hard cover</td>
<td>unit</td>
<td>4</td>
</tr>
<tr>
<td>Health card with plastic cover</td>
<td>unit</td>
<td>500</td>
</tr>
<tr>
<td>Small plastic bags for medicines</td>
<td>unit</td>
<td>3000</td>
</tr>
<tr>
<td>Notepad A6</td>
<td>unit</td>
<td>10</td>
</tr>
<tr>
<td>Thermometer, Celsius, clinical, flat type</td>
<td>unit</td>
<td>6</td>
</tr>
<tr>
<td>Glove, examination, latex, pre-powdered non-sterile, disposable</td>
<td>unit</td>
<td>100</td>
</tr>
<tr>
<td>Treatment guidelines for basic list</td>
<td>unit</td>
<td>2</td>
</tr>
</tbody>
</table>

# Equipment

<table>
<thead>
<tr>
<th>Equipment</th>
<th>unit</th>
<th>no. of units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nail brush, plastic, autoclavable</td>
<td>unit</td>
<td>2</td>
</tr>
<tr>
<td>Bucket, plastic, approx. 12 liters</td>
<td>unit</td>
<td>2</td>
</tr>
<tr>
<td>Gallipot, stainless steel, 100 ml</td>
<td>unit</td>
<td>1</td>
</tr>
<tr>
<td>Kidney dish, stainless steel, approx. 26x14 cm</td>
<td>unit</td>
<td>1</td>
</tr>
<tr>
<td>Dressing set (3 instruments + box)</td>
<td>unit</td>
<td>2</td>
</tr>
<tr>
<td>Dressing tray, stainless steel approx. 30x15x3 cm</td>
<td>unit</td>
<td>1</td>
</tr>
<tr>
<td>Drum for compresses with lateral clips 15cm H, diam. 15cm</td>
<td>unit</td>
<td>2</td>
</tr>
<tr>
<td>Foldable jerry can, 20 liters</td>
<td>unit</td>
<td>1</td>
</tr>
<tr>
<td>Forceps Kocher, no teeth, 12-14 cm</td>
<td>unit</td>
<td>2</td>
</tr>
<tr>
<td>Plastic bottle, 1 liter</td>
<td>unit</td>
<td>3</td>
</tr>
<tr>
<td>Syringe Luer, disposable, 10 ml</td>
<td>unit</td>
<td>1</td>
</tr>
<tr>
<td>Plastic bottle 125 ml</td>
<td>unit</td>
<td>1</td>
</tr>
<tr>
<td>Scissors straight/blunt, 12-14 cm</td>
<td>unit</td>
<td>2</td>
</tr>
</tbody>
</table>

## Supplementary Unit

The supplementary unit is designed for use by physicians and senior health workers for a population of 10,000 persons for 3 months. To be operational, the supplementary unit should be used with 10 basic units.

<table>
<thead>
<tr>
<th>Medicines</th>
<th>unit</th>
<th>no. of units</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anesthetics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ketamine, inj., 50 mg/ml</td>
<td>10 ml/vial</td>
<td>25</td>
</tr>
<tr>
<td>Lidocaine, inj. 1%</td>
<td>20 ml/vial</td>
<td>50</td>
</tr>
<tr>
<td><strong>Analgesics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morphine inj. 10 mg/ml</td>
<td>1 ml/ampule</td>
<td>50</td>
</tr>
<tr>
<td><strong>Anti-allergics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrocortisone powder 100 mg</td>
<td>100mg powder for inj. in vial</td>
<td>50</td>
</tr>
<tr>
<td>Prednisolone, tab 5 mg</td>
<td>tab</td>
<td>100</td>
</tr>
<tr>
<td>Epinephrine (see respiratory tract)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Antidotes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Naloxone inj., 0.4 mg/ml</td>
<td>1 ml/ampule</td>
<td>200</td>
</tr>
<tr>
<td><strong>Anti-epileptics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diazepam, inj. 5 mg/ml</td>
<td>2 ml/ampoule</td>
<td>200</td>
</tr>
<tr>
<td>Phenobarbital, tab 50 mg</td>
<td>tab</td>
<td>1000</td>
</tr>
<tr>
<td><strong>Anti-infective medications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ampicillin, tab 250 mg</td>
<td>Scored tab</td>
<td>3000</td>
</tr>
<tr>
<td>Ampicillin, inj. 500 mg/vial</td>
<td>vial</td>
<td>200</td>
</tr>
<tr>
<td>Benzathine benzylpenicillin, inj. 2.4 MIU/vial</td>
<td>vial</td>
<td>50</td>
</tr>
<tr>
<td>Benzylpenicillin, inj. 5 MIU/vial</td>
<td>vial</td>
<td>250</td>
</tr>
<tr>
<td>Chloramphenicol, caps 250 mg</td>
<td>caps</td>
<td>2000</td>
</tr>
<tr>
<td>Chloramphenicol, inj. 1 g/vial</td>
<td>vial</td>
<td>500</td>
</tr>
<tr>
<td>Doxycycline, tab 100mg</td>
<td>caps or tab</td>
<td>2000</td>
</tr>
<tr>
<td>Metronidazole, tab 250 mg</td>
<td>tab</td>
<td>2000</td>
</tr>
<tr>
<td>Medications affecting the blood</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Folic acid, tab 5 mg</td>
<td>tab 1000</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cardiovascular medications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyldopa, 250 mg</td>
<td>tab 500</td>
</tr>
<tr>
<td>Hydralazine, inj. 20 mg/ml</td>
<td>ampule 20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dermatological</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyvidone iodine, 10%, sol</td>
<td>200 ml bottle 10</td>
</tr>
<tr>
<td>Silver sulfadiazine cream 1%</td>
<td>50g tube 30</td>
</tr>
<tr>
<td>Benzoic acid 6% + salicylic acid 3% ointment</td>
<td>40g tube 25</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diuretics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Furosemide, inj., 10 mg/ml</td>
<td>2 ml/ampule 20</td>
</tr>
<tr>
<td>Hydrochlorothiazide, tab 25mg</td>
<td>Tab 200</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emergency contraceptives</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethinylestradiol 50 mcg + Levonorgestrel 250mcg</td>
<td>pack of 4 100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gastro-intestinal medications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Promethazine, tab 25 mg</td>
<td>tab 500</td>
</tr>
<tr>
<td>Promethazine, inj. 25 mg/ml</td>
<td>2 ml/ampule 50</td>
</tr>
<tr>
<td>Atropine inj. 1 mg/ml</td>
<td>1 ml/ampule 50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Oxytocics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxytocin inj. 10 IU/ml</td>
<td>1 ml/ampule 200</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Psychotherapeutic medications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorpromazine, inj. 25 mg/ml</td>
<td>2 ml/ampule 20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medications acting on the respiratory tract</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Salbutamol tab 4mg</td>
<td>tab 1000</td>
</tr>
<tr>
<td>Aminophylline, inj. 25 mg/ml</td>
<td>10 ml/ampoule 50</td>
</tr>
<tr>
<td>Epinephrine, inj. 1 mg/ml</td>
<td>1 ml/ampoule 50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Solutions for correction of water, electrolyte and acid-base disturbances</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ringer’s lactate, with giving set and needle</td>
<td>500 ml/bag 200</td>
</tr>
<tr>
<td>Glucose, inj. Sol 5% with giving set and needle</td>
<td>500 ml/bag 100</td>
</tr>
<tr>
<td>Glucose, inj. sol. 50%</td>
<td>50 ml/vial 20</td>
</tr>
<tr>
<td>Water for injection</td>
<td>10 ml/plastic vial 2000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vitamins</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Retinol (Vitamin A) caps, 200,000 IU</td>
<td>caps 4000</td>
</tr>
<tr>
<td>Ascorbic acid, tab 250 mg</td>
<td>tab 4000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Renewable supplies</th>
<th>unit</th>
<th>No. of units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scalp vein infusion set, disposable 25 G (diam 0.5 mm)</td>
<td>unit</td>
<td>300</td>
</tr>
<tr>
<td>Item</td>
<td>Quantity</td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------------------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>Scalp vein infusion set, disposable 21G (diam 0.8 mm)</td>
<td>unit 100</td>
<td></td>
</tr>
<tr>
<td>IV placement canula, disposable 18G (diam 1.3 mm)</td>
<td>unit 15</td>
<td></td>
</tr>
<tr>
<td>IV placement canula, disposable, 22G (diam 0.8 mm)</td>
<td>unit 15</td>
<td></td>
</tr>
<tr>
<td>IV placement canula, disposable, 24G (diam 0.7 mm)</td>
<td>unit 15</td>
<td></td>
</tr>
<tr>
<td>Needle Luer IV, disposable 19G (diam 1.1×38 mm)</td>
<td>unit 1000</td>
<td></td>
</tr>
<tr>
<td>Needle Luer IM, disposable 21G (diam 0.8×40 mm)</td>
<td>unit 2000</td>
<td></td>
</tr>
<tr>
<td>Needle Luer SC, disposable 25G (diam 0.5×16 mm)</td>
<td>unit 100</td>
<td></td>
</tr>
<tr>
<td>Spinal needle, disposable 22G (diam 0.7×40 mm) black</td>
<td>unit 25</td>
<td></td>
</tr>
<tr>
<td>Spinal needle, disposable 20G (diam 0.9×90 mm) yellow</td>
<td>unit 25</td>
<td></td>
</tr>
<tr>
<td>Syringe Luer resterilisable, nylon, 2 ml (diam 0.9×90mm)</td>
<td>unit 20</td>
<td></td>
</tr>
<tr>
<td>Syringe Luer resterilisable, nylon 5 ml</td>
<td>unit 100</td>
<td></td>
</tr>
<tr>
<td>Syringe Luer resterilisable, nylon 10 ml</td>
<td>unit 40</td>
<td></td>
</tr>
<tr>
<td>Syringe Luer disposable, 2 ml</td>
<td>unit 400</td>
<td></td>
</tr>
<tr>
<td>Syringe Luer disposable, 5 ml</td>
<td>unit 500</td>
<td></td>
</tr>
<tr>
<td>Syringe Luer disposable, 10 ml</td>
<td>unit 200</td>
<td></td>
</tr>
<tr>
<td>Syringe conic connector (for feeding), 60 ml</td>
<td>unit 20</td>
<td></td>
</tr>
<tr>
<td>Feeding tube CH 5 or 6 (premature baby), Luer tip, 40 cm disposable</td>
<td>unit 20</td>
<td></td>
</tr>
<tr>
<td>Feeding tube CH 8, Luer tip, 40cm disposable</td>
<td>unit 50</td>
<td></td>
</tr>
<tr>
<td>Feeding tube CH 16, conical tip, 125cm disposable</td>
<td>unit 10</td>
<td></td>
</tr>
<tr>
<td>Urinary catheter (Foley), no 12, disposable</td>
<td>unit 10</td>
<td></td>
</tr>
<tr>
<td>Urinary catheter (Foley), no 14, disposable</td>
<td>unit 5</td>
<td></td>
</tr>
<tr>
<td>Urinary catheter (Foley), no 18, disposable</td>
<td>unit 5</td>
<td></td>
</tr>
<tr>
<td>Surgical gloves sterile and resterilisable no 6.5 Pair</td>
<td>Pair 50</td>
<td></td>
</tr>
<tr>
<td>Surgical gloves sterile and resterilisable no 7.5 Pair</td>
<td>Pair 150</td>
<td></td>
</tr>
<tr>
<td>Surgical gloves sterile and resterilisable no 8.5 Pair</td>
<td>Pair 50</td>
<td></td>
</tr>
<tr>
<td>Safety box for disposal of used syringe &amp; needles</td>
<td>unit 20</td>
<td></td>
</tr>
<tr>
<td>Sterilization test tape (for autoclave)</td>
<td>Roll 2</td>
<td></td>
</tr>
<tr>
<td>Sodium dichloroisocyanate, tab 1.67g</td>
<td>tab 1200</td>
<td></td>
</tr>
<tr>
<td>Thermometer, Celsius, clinical, flat-type</td>
<td>unit 10</td>
<td></td>
</tr>
<tr>
<td>Spare bulb for otoscope</td>
<td>unit 4</td>
<td></td>
</tr>
<tr>
<td>Batteries R6 alkaline AA size (for otoscope)</td>
<td>unit 12</td>
<td></td>
</tr>
<tr>
<td>Urine collecting bag with valve, 2000 ml</td>
<td>unit 10</td>
<td></td>
</tr>
<tr>
<td>Glove, examination, latex nonsterile, large</td>
<td>unit 100</td>
<td></td>
</tr>
<tr>
<td>Glove, examination, latex nonsterile, medium</td>
<td>unit 100</td>
<td></td>
</tr>
<tr>
<td>Glove, examination, latex nonsterile, small</td>
<td>unit 100</td>
<td></td>
</tr>
<tr>
<td>Mucus extractor, disposable</td>
<td>unit 5</td>
<td></td>
</tr>
<tr>
<td>Suture, synthetic absorbable, braided, 70 cm size DEC 3 (USP 00)</td>
<td>4x36 units 144</td>
<td></td>
</tr>
<tr>
<td>Surgical blade (surgical knives) no 22 for handle no 4</td>
<td>unit 50</td>
<td></td>
</tr>
<tr>
<td>Tape umbilical, nonsterile, 3mm wide x 100m spool</td>
<td>unit 1</td>
<td></td>
</tr>
<tr>
<td>Razor blade</td>
<td>unit 100</td>
<td></td>
</tr>
<tr>
<td>Tongue depressor (wooden, disposable)</td>
<td>unit 100</td>
<td></td>
</tr>
<tr>
<td>Gauze roll 90 m x 0.90 m</td>
<td>roll 3</td>
<td></td>
</tr>
</tbody>
</table>
Gauze compresses, 10 x 10 cm, 12 ply, sterile  

<table>
<thead>
<tr>
<th>Equipment</th>
<th>unit</th>
<th>No. of units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apron, utility, plastic reusable</td>
<td>unit</td>
<td>2</td>
</tr>
<tr>
<td>Clinical stethoscope, dual cup</td>
<td>unit</td>
<td>4</td>
</tr>
<tr>
<td>Obstetrical stethoscope (metal)</td>
<td>unit</td>
<td>1</td>
</tr>
<tr>
<td>Sheet, plastic PVC clear, 90x180 cm</td>
<td>unit</td>
<td>2</td>
</tr>
<tr>
<td>Sphygmomanometer (adult)</td>
<td>unit</td>
<td>4</td>
</tr>
<tr>
<td>Razor non-disposable</td>
<td>unit</td>
<td>2</td>
</tr>
<tr>
<td>Scale for adult</td>
<td>unit</td>
<td>1</td>
</tr>
<tr>
<td>Scale hanging 25 kg x 100 g (Salter type) + trousers</td>
<td>unit</td>
<td>3</td>
</tr>
<tr>
<td>Tape measure (cm/mm)</td>
<td>unit</td>
<td>5</td>
</tr>
<tr>
<td>Tape measure, mid-upper arm circumference</td>
<td>unit</td>
<td>10</td>
</tr>
<tr>
<td>Towel HUCK, 430x500 mm</td>
<td>unit</td>
<td>2</td>
</tr>
<tr>
<td>Drum for compresses 10x15cm</td>
<td>unit</td>
<td>2</td>
</tr>
<tr>
<td>Otoscope + set of pediatric speculums</td>
<td>unit</td>
<td>2</td>
</tr>
<tr>
<td>Tourniquet</td>
<td>unit</td>
<td>2</td>
</tr>
<tr>
<td>Dressing tray, stainless steel approx 30x20x3 cm</td>
<td>unit</td>
<td>1</td>
</tr>
<tr>
<td>Kidney dish, stainless steel approx 26x14 cm</td>
<td>unit</td>
<td>1</td>
</tr>
<tr>
<td>Scissors straight/blunt 12/14 cm</td>
<td>unit</td>
<td>2</td>
</tr>
<tr>
<td>Forceps Kocher no teeth, 12/14 cm</td>
<td>unit</td>
<td>2</td>
</tr>
<tr>
<td>Abscess/suture set (7 instruments + box)</td>
<td>unit</td>
<td>2</td>
</tr>
<tr>
<td>Dressing set (3 instruments + box)</td>
<td>unit</td>
<td>5</td>
</tr>
<tr>
<td>Delivery set</td>
<td>unit</td>
<td>1</td>
</tr>
<tr>
<td>Pressure sterilizer, 15 liters (type: Prestige 7503, double rack)</td>
<td>unit</td>
<td>1</td>
</tr>
<tr>
<td>Pressure sterilizer, 21 liters with basket</td>
<td>unit</td>
<td>1</td>
</tr>
<tr>
<td>Kerosene stove, single burner, tank capacity 1-2 liters (type: UNICEF 017.000)</td>
<td>unit</td>
<td>2</td>
</tr>
<tr>
<td>Water filter with candles, 10/20 liters (type: UNICEF 561.9902)</td>
<td>unit</td>
<td>3</td>
</tr>
<tr>
<td>Nail brush, plastic, autoclavable</td>
<td>unit</td>
<td>2</td>
</tr>
<tr>
<td>Clinical guidelines (diagnostic and treatment manual)</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX 2: Hospital Emergency Incident Command System (HEICS) – An Overview

Background

First implemented in 1993, clear advantages were observed in hospitals (mainly in the United States) that used the Hospital Emergency Incident Command System (HEICS). Among the advantageous features observed were: predictable chain of management, flexible organizational chart that allows flexible response to specific emergencies, prioritized response checklists, accountability of position function, improved documentation for improved accountability and cost recovery, common language to promote communication and facilitate outside assistance, and cost effective emergency planning within health care organizations. Moreover, adoption of the system proved to be financially beneficial for the facilities because it allowed them to remain operational after a disaster, with prompt restoration of day-to-day hospital function.

HEICS Key Concepts

The third edition of HEICS, produced by the County of San Mateo Emergency Medical Services Agency under a grant by the State of California EMS Authority, adheres to the basic attributes formulated/enumerated in the first edition:

- **Responsibility oriented chain of command**
  The organizational structure recommended by HEICS allows for the addressing of many aspects of an emergency. It also allows a manageable scope of supervision for all functions.

- **Wide acceptance through commonality of mission and language**
  The organizational chart utilizes broadly accepted titles, fostering acceptance in both public and private circles.

- **Prioritization of duties with the use of Job Action Sheets (JAS)**
  JAS are job descriptions containing a prioritized list of emergency response tasks. These also serve as reminders for reporting and promoting the documentation of an emergency incident.

- **Applicability to varying types and magnitudes of emergency events**
  The system is flexible, allowing changes in programs that would meet specific needs in specific crisis situations.

- **Thorough documentation of actions taken in response to the emergency**
  The JAS will facilitate documentation of the facility’s response to emergencies. This, in turn, will improve recovery of financial expenditures while decreasing liabilities.

- **Expeditious transfer of resources (mutual aid) within a particular system or from one facility to another**
  Because of the use of a common system of management, HEICS will facilitate the exchange of resources during a crisis.

- **Minimal disruption to existing hospital departments by virtue of parallel job qualifications/duties**
  While the HEICS organization structure is specially designed for use during emergencies, it is apparent that many individuals within the regular day-to-day

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155 Adapted from the *Hospital Emergency Incident Command System 3rd Edition, 1998*, prepared by the State of California Emergency Medical Services Authority.
management structure of the health facility have responsibilities similar to those prescribed by HEICS.

**HEICS Organization**

*Figure 1* illustrates the entire organization chart as formulated by HEICS. Each position in the chart has a written *Job Action Sheet* that specifies the important roles and duties of every team member during an emergency. An individual may be assigned more than one position, especially during critical situations wherein an individual has to perform multiple tasks until additional support can be obtained. The provision of distinct position checklists makes this possible.

As previously mentioned, the HEICS plan is flexible. During a crisis, only those positions which are needed should be activated. Efficiency and cost effectiveness are promoted because the system allows for the addition of needed positions or conversely, deactivation of positions at any time. While major disasters may require full activation of the system, most emergencies usually require the activation of only a few positions. *Figure 2* gives an example of minimal staffing activation (e.g. during an early morning major vehicular accident).

**HEICS Implementation**

The length of time needed to implement HEICS in a health facility depends on the size of the facility, the number of people committed to the project, availability of funds, and the amount of support given by the management. The implementation of HEICS in a health facility goes through several phases:

1) **HEICS Concept Briefing**
   Interested administrators and emergency planners can be briefed by someone experienced in HEICS. Details regarding the estimated cost of implementation and maintenance on HEICS should be discussed at this point. The result of the briefing would be the facility’s decision either to accept or reject a plan to implement HEICS.

2) **Commitment to Adapt the HEICS Plan**
   A transition team should be appointed once the decision to implement HEICS has been made. As many upper level managers as possible should be involved. Members of the team are expected to devote five to ten hours a week for one to three months in order to effect the transition.

3) **Establishment of the HEICS Implementation Committee**
   The HEICS Implementation Committee is composed of staff members of various management levels and from different department. The committee’s role is to construct a comprehensive program that will integrate HEICS into the facility while promoting a positive attitude toward the facility’s revised emergency response plan.

4) **Management Briefing**
   The briefing, co-sponsored by the HEICS Implementation Team and a Board representative, aims to solidify support for the program in all areas of the health facility. This involves both education and public relations.
5) Revision of the Health Facility's Disaster / Emergency Plan
The current disaster plan of the health facility needs to be reconfigured so that the Incident Command System serves as the standard operating procedure.

6) Introductory Lesson for All Employees
The staff of the health facility are instructed on the HEICS plan; all levels and areas of service should be in attendance. Participants of the session are made aware of the plan and its effect on their particular disaster response.

7) Staff Table Top Exercise
This is a paper drill that aims to demonstrate the working and communication relationships of functions found within the HEICS organizational plan. It is intended for administrators, managers, and personnel who will be placed into and officer’s position once the plan is activated.

8) Full Functional Exercise of the HEICS Plan
The new HEICS disaster response plan is tested when the health facility conducts a general disaster drill. This involves the activation and simulated activity of all sections of the Incident Command System.

8) Continuing Staff Education
Periodic sessions are held in order to keep all hospital responders committed to disaster preparedness and proficient in emergency operating procedures. Educational offerings may be centered on paper or functional exercises, new disaster-related topics, or review of the disaster plan.

Further Reading
For a more comprehensive discussion on HEICS, the reader is advised to refer to the original manuscript drafted by the State of California EMS Authority.
APPENDIX 3: Sample Message Based on Standard Themes

<table>
<thead>
<tr>
<th>Theme</th>
<th>Topic</th>
<th>Sample message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information</td>
<td>Stay turned to radio</td>
<td>“This was the message from the emergency Operating Committee. For more information, please contact health personnel at the nearest Health Centre. The next message will be broadcast at...”</td>
</tr>
<tr>
<td>Source of Information</td>
<td>Examples of Official Information Centers: National Disaster Committee and Ministry of Health</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>Potability; contamination</td>
<td>“During and after a disaster, there may be high level of water contamination because of broken water mains. Also, there may be loss of electricity which would effect the pumping of electricity to homes. The ministry of Health will inform you about the situation immediately after the disaster. Do not drink tap water until being informed by officials.”</td>
</tr>
<tr>
<td>Quantity; Storage</td>
<td>“Planning ahead is the best way you and your family can prepare for a hurricane. It is wise to store as much water as possible. Water should be placed in clean covered containers. Empty plastic cooking oil, soft drink and bleach bottles can be good water storage containers. However, water should not be stored in empty herbicide, pesticide or motor oil containers. If you have any questions, please contact....”</td>
<td></td>
</tr>
<tr>
<td>House Safety</td>
<td>“If a house is not safe, go to a neighbor or arrange for other shelter. Increase safety of your house by checking condition of roof, shutters, valves and making necessary repairs. Check condition of trees, removing dead limbs.”</td>
<td></td>
</tr>
<tr>
<td>House Storage of equipment and tools</td>
<td>“Store basic tools and materials that will be needed for repairs following a disaster in an easily accessible place. Keep on hand equipment that will be needed during a disaster such as flashlight, batteries.”</td>
<td></td>
</tr>
<tr>
<td>Evacuation</td>
<td>“If in flood prone area, be prepared to evacuate. Keep tuned to radio to learn of other evacuation plans.”</td>
<td></td>
</tr>
<tr>
<td>Food Storage</td>
<td>“Most disasters result in some kind of food shortage. Don’t wait until after a hurricane to ask, ‘How am I going to feed my family?’ It is wise to have an emergency food supply. Keep a small supply of canned goods, dry food items such as rice, cornmeal, flour and sugar. Make sure you have foods that do not need refrigerator or cooking such as canned meat, salted meat and fish, biscuits, condensed milk. If you need further information, please contact...”</td>
<td></td>
</tr>
<tr>
<td>Food preservation</td>
<td>“Without electricity, special precautions must be taken to ensure the safety of refrigerated cooked foods and to avoid food poisoning. Frozen foods which have thawed should be cooked and eaten the same day. Meats and fish can be preserved by salting and pickling.”</td>
<td></td>
</tr>
</tbody>
</table>

156 PAHO, Communicating with the Public in Times of Disaster, pp. 20-30.
| Provision for cooking food; energy supply | “Keep a supply of charcoal, kerosene, a coal pot and a kerosene stove for cooking. Make sure that the stove is always in working condition” |

## SAMPLE MESSAGES FOR PUBLIC IN PERIOD *DURING THE DISASTER*

| Injuries | Injuries | Stop bleeding  
| Treat minor injuries at home  
| Do not expose yourself to the elements |
| House | Safety | Stay indoors and close all windows, taps.  
| Be careful When using candles. |
| Food | Food | Watch what you can eat and buy. |

## SAMPLE MESSAGES FOR PUBLIC IN PERIOD *FOLLOWING THE DISASTER*

| Information | Keep listening to the radio |
| Water | Potability | Contaminated water can help the spread of diseases such as gastroenteritis, dysentery, typhoid, leptospirosis, and cholera. To prevent the spread of disease, use boiled or chlorinated water for drinking and preparation of foods |
| Purification | Watercollectedshouldbeboiledordisinfected before it is used for human consumption. To disinfect five (5) gallons of water, that is, the amount of water in a standard bucket, one teaspoonful of any household bleach should be added to the water. The water should then be stirred thoroughly and allowed to stand for thirty (30) minutes. The water is then ready to be used for the preparation of food and drinking. Continue to disinfect the water until the Ministry of Health declares that the water in your area is safe. |
| Sanitation | Excreta disposal | If toilet are destroyed or severely damaged after a hurricane or any other disaster, in order to prevent the spread of disease, a pit latrine should installed for the disposal of human excreta. All body waste, including that of all children, should be sanitarily disposed of by placing into a pit. Latrines should always be located on the downhill side of rivers, springs or wells or any other water source. |
APPENDIX 4: Examples of Establishments Likely to Hold Hazardous Materials

<table>
<thead>
<tr>
<th>LOCATIONS</th>
<th>HAZARDOUS MATERIALS AND OTHER SUBSTANCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Large storage or combustible-processing facilities</td>
<td>Gasoline, naphta, hydrofluoric acid, propane, butane, ethylene, propylene, mercaptan, liquefied natural gas and other combustibles</td>
</tr>
<tr>
<td>Refinery and storage</td>
<td>Gasoline, propane, butane and other combustibles</td>
</tr>
<tr>
<td>Intermediary storage</td>
<td>Gasoline, diesel, propane, butane and other combustibles</td>
</tr>
<tr>
<td>Service station</td>
<td>Gasoline, diesel, propane</td>
</tr>
<tr>
<td>2. Transport of petroleum or gasoline</td>
<td>Natural gas, propane</td>
</tr>
<tr>
<td>Gas distribution center</td>
<td>Natural gas, propane, butane, ethylene, ethane, methane, kerosene, crude petroleum, chlorine, hydrogen, etc.</td>
</tr>
<tr>
<td>Pipelines</td>
<td>Natural gas, propane, butane, ethylene, ethane, methane, kerosene, crude petroleum, chlorine, hydrogen, etc.</td>
</tr>
<tr>
<td>3. Large cooling factories</td>
<td>Ammonia</td>
</tr>
<tr>
<td>Food industry</td>
<td>Ethyl oxide</td>
</tr>
<tr>
<td>4. Food</td>
<td>Ethyl oxide</td>
</tr>
<tr>
<td>Spices</td>
<td>Sulfur dioxide</td>
</tr>
<tr>
<td>Sugar industry</td>
<td>Methyl bromide</td>
</tr>
<tr>
<td>Flour processing</td>
<td>Hexane</td>
</tr>
<tr>
<td>Extraction of vegetable or animal oils and fats</td>
<td>Hexane, ammonia</td>
</tr>
<tr>
<td>Cocoa, chocolate and coffee industry</td>
<td>Various solvents, ammonia</td>
</tr>
<tr>
<td>Yeast</td>
<td>Ammonia</td>
</tr>
<tr>
<td>Brewery</td>
<td>Ammonia</td>
</tr>
<tr>
<td>Distilleries, alcohol bottling</td>
<td>Ethanol</td>
</tr>
<tr>
<td>5. Specific basic products</td>
<td>Acrolein, formic acid</td>
</tr>
<tr>
<td>Leather industry (tannery)</td>
<td>Formaldehyde, impregnation agents</td>
</tr>
<tr>
<td>Wood distribution industry</td>
<td>Chlorine, chlorine dioxide, sulfur dioxide, ammonia</td>
</tr>
<tr>
<td>Paper industry</td>
<td>Styrene, butadiene</td>
</tr>
<tr>
<td>Rubber industry</td>
<td>Hydrofluoric acid</td>
</tr>
<tr>
<td>Glass industry</td>
<td>Hydrofluoric acid</td>
</tr>
<tr>
<td>6. Metallurgic and electronic industry</td>
<td>Hydrofluoric acid, oleum, chlorine</td>
</tr>
<tr>
<td>Aluminum smelters</td>
<td>Hydrochloric acid, chlorine, hydrogen, sulfur dioxide</td>
</tr>
<tr>
<td>Magnesium</td>
<td>Carbon monoxide, nitric oxide</td>
</tr>
<tr>
<td>Gold</td>
<td>Lead compounds</td>
</tr>
<tr>
<td>Smelting furnaces</td>
<td>Acids, plating solutions, arsine, cyanides</td>
</tr>
<tr>
<td>Surface preparation (plating)</td>
<td>Sulfuric acid, arsenic, sulfur dioxide</td>
</tr>
<tr>
<td>Copper refining</td>
<td>Arsine, trimethylchlorosilane</td>
</tr>
<tr>
<td>Pigments of titanium dioxide</td>
<td>Ammonia, nitric acid, nitric oxide, ammonium nitrate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Synthetic resins</th>
<th>Ethylene oxide, propylene oxide, chlorine, acrylonitrile, phosgene, isocyanates, formaldehyde, styrene</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber</td>
<td>Butadiene, styrene</td>
</tr>
<tr>
<td>Plastics and other synthetic products</td>
<td>Ethylene, propylene, vinyl chloride, acrylonitrile, chlorine, toxic combustion products</td>
</tr>
<tr>
<td>Paints and pigments</td>
<td>Phosgene, various solvents</td>
</tr>
<tr>
<td>Perfumes and essences</td>
<td>Acids, solvents, toxic combustion products</td>
</tr>
<tr>
<td>Synthetic products</td>
<td>Carbon sulfide, hydrogen sulfide</td>
</tr>
<tr>
<td>Medications and other pharmaceutical products</td>
<td>Chlorine, sulfur compounds, solvents, formic acid</td>
</tr>
<tr>
<td>Detergents</td>
<td>Acids, bases, ethylene oxide</td>
</tr>
<tr>
<td>Cleaning agents</td>
<td>Acids, bases</td>
</tr>
<tr>
<td>Linoleum products</td>
<td>Solvents, toxic combustion products</td>
</tr>
<tr>
<td>Textiles</td>
<td>Lye, dyes, solvents, formic acid</td>
</tr>
<tr>
<td>Printing products</td>
<td>Solvents</td>
</tr>
<tr>
<td>Photographic and cinematographic products</td>
<td>Nitrocellulose</td>
</tr>
<tr>
<td>Fluorocarbons</td>
<td>Hydrofluoric acid</td>
</tr>
</tbody>
</table>

**8. Pesticides**

<table>
<thead>
<tr>
<th>Production of raw materials</th>
<th>Phosgene, isocyanates, chlorine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulk sale and storage</td>
<td>Toxic powders and liquids, toxic combustion products, ammonia</td>
</tr>
<tr>
<td>Retail sale and storage</td>
<td>Various substances, methyl bromide</td>
</tr>
<tr>
<td>Smelting furnaces</td>
<td>Cyanides, sulfur dioxide</td>
</tr>
</tbody>
</table>

**9. Chemical products: non-specific raw materials**

<table>
<thead>
<tr>
<th>Inorganic products</th>
<th>Chlorine, ammonia, hydrochloric acid, sulfuric acid, oleum, sulfur dioxide, chlorine dioxide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic products</td>
<td>Acrylonitrile, phosgene, solvents</td>
</tr>
<tr>
<td>Industrial gases</td>
<td>Hydrogen, solvents, phosgene</td>
</tr>
</tbody>
</table>

**10. Explosives**

<table>
<thead>
<tr>
<th>Production and storage of explosives</th>
<th>Explosives, nitric acid, TNT, ANFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage of munitions</td>
<td>Munitions, TNT</td>
</tr>
<tr>
<td>Manufacturing and sale of fireworks</td>
<td>Fireworks, pyrotechnic parts</td>
</tr>
<tr>
<td>Others</td>
<td>Hydrogen peroxide, organic peroxides, ammonium nitrate, sodium chlorate, etc.</td>
</tr>
</tbody>
</table>

**11. Public areas and services**

<table>
<thead>
<tr>
<th>Drinking water filtration plant</th>
<th>Chlorine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sewage treatment plant</td>
<td>Chlorine, hydrogen peroxide</td>
</tr>
<tr>
<td>Pool</td>
<td>Chlorine</td>
</tr>
<tr>
<td>Arena, rink</td>
<td>Ammonia</td>
</tr>
<tr>
<td>Hospital</td>
<td>Oxygen, gas and various solvents</td>
</tr>
</tbody>
</table>

**12. Pipelines except those used for fixed installations**

|                        | Chlorine                                                                 |

**13. Laundries**

|                        | Chlorinated solvents                                                   |

**14. Centres for transferring, processing, and eliminating hazardous materials**

|                        | Solvents, chlorinated solvents, cyanides                               |

**15. PVC industries**

|                        | Hydrogen chloride, chlorine, phosgene, dioxins                         |

**16. Storage sites for hazardous waste**

|                        | Various chemical products                                              |

**17. Storage for PBC’s, tires, various scraps (plastic)**

|                        | Toxic combustion products                                              |
### APPENDIX 5: Microorganisms Associated with Airborne Transmission

<table>
<thead>
<tr>
<th>Category</th>
<th>Fungi</th>
<th>Bacteria</th>
<th>Viruses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numerous reports in health-care facilities</td>
<td>Aspergillus sp.</td>
<td>M. tuberculosis</td>
<td>Rubeola</td>
</tr>
<tr>
<td></td>
<td>Mucorales sp.</td>
<td></td>
<td>Varicella-zoster</td>
</tr>
<tr>
<td>Atypical, occasional reports</td>
<td>Acremonium sp.</td>
<td>Acinetobacter sp.</td>
<td>Variola</td>
</tr>
<tr>
<td></td>
<td>Fusarium sp.</td>
<td>Bacillus sp.</td>
<td>Influenza</td>
</tr>
<tr>
<td></td>
<td>P. boydii</td>
<td>Brucella sp.</td>
<td>RSV</td>
</tr>
<tr>
<td></td>
<td>Scedosporium sp.</td>
<td>S. aureus</td>
<td>Adenovirus</td>
</tr>
<tr>
<td></td>
<td>S. cyanescens</td>
<td>Group A</td>
<td>Norwalk-like virus</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Streptococcus</td>
<td></td>
</tr>
<tr>
<td>Airborne in nature; airborne transmission in</td>
<td>C. immitis</td>
<td>C. burnetti</td>
<td>Hantavirus</td>
</tr>
<tr>
<td>health care settings not described</td>
<td>Cryptococcus sp.</td>
<td></td>
<td>Lassa</td>
</tr>
<tr>
<td></td>
<td>H. Capsulatum</td>
<td></td>
<td>Marburg</td>
</tr>
<tr>
<td>Under investigation</td>
<td>P. Carinii</td>
<td></td>
<td>Ebola</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Crimean-Congo</td>
</tr>
</tbody>
</table>

APPENDIX 6: Engineered Specifications for Negative Pressure Rooms

<table>
<thead>
<tr>
<th>Negative Pressure Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure differentials</td>
</tr>
<tr>
<td>Air changes per hour (ACH)</td>
</tr>
</tbody>
</table>
| Filtration efficiency  | Supply: 90% (dust spot test)  
Return: 99.97% |
| Room airflow direction  | Into the room |
| Clean-to-dirty airflow in room | Towards the patient |
| Ideal pressure differential | > -2.5 Pa |

Example of Airborne Infection Isolation Room

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159 Table adapted from Sehulster et al, p. 19.
160 Figure adapted from Sehulster et al, p. 36.
## APPENDIX 7: Common Agents Used in Chemical Warfare

### CHEMICAL AGENTS

<table>
<thead>
<tr>
<th>Chemical Agents</th>
<th>TOXIC</th>
<th>INCAPACITATING / RIOT CONTROL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulmonary Agents</td>
<td>* Pulmonary Agents</td>
<td>* Cyanide</td>
</tr>
<tr>
<td>Cyanide</td>
<td>* Viscants</td>
<td>* Nerve Agents</td>
</tr>
</tbody>
</table>

### General Class | Agents | Antidote |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pulmonary Agents</strong></td>
<td>Phosgene, Perfluororisobutylene, HC Smoke, Oxides of Nitrogen</td>
<td>None</td>
</tr>
<tr>
<td><strong>Cyanide</strong></td>
<td>Hydrocyanic Acid, Cyanogen Chloride</td>
<td>Intravenous sodium nitrite and sodium thiosulfate</td>
</tr>
<tr>
<td><strong>Vesicants</strong></td>
<td>Mustard, Lewisite, Phosgene oxime</td>
<td>BAL (for Lewisite)</td>
</tr>
<tr>
<td><strong>Nerve Agents</strong></td>
<td>Tabun, Sarin, Soman</td>
<td>Atropine, Pralidoxime</td>
</tr>
<tr>
<td><strong>Incapacitating Agents</strong></td>
<td>BZ, Agent 15</td>
<td>Physostigmine</td>
</tr>
<tr>
<td><strong>Riot-Control Agents</strong></td>
<td>Corson &amp; Stoughton Mace</td>
<td>None</td>
</tr>
</tbody>
</table>

---

### APPENDIX 8: Common Agents Used in Biological Warfare

<table>
<thead>
<tr>
<th>Disease</th>
<th>Chemotherapy</th>
<th>Chemoprophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anthrax</strong></td>
<td>Ciprofloxacin 400mg IV q12h or Doxycycline 200mg IV, then 100mg IV q12h</td>
<td>Ciprofloxacin 500mg PO bid x 4wk if unvaccinated, begin initial doses of vaccine</td>
</tr>
<tr>
<td></td>
<td>Penicillin 4 million units IV q4h</td>
<td>Doxycycline 100mg PO bid x 4wk plus vaccination</td>
</tr>
<tr>
<td><strong>Cholera</strong></td>
<td>Oral rehydration therapy</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Tetracycline 500mg q6h x 3d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Doxycycline 300mg one, or 100mg q12h x 3d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ciprofloxacin 500mg q12h x 3d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Norfloxacin 400mg q12h x 3d</td>
<td></td>
</tr>
<tr>
<td><strong>Q Fever</strong></td>
<td>Tetracycline 500mg PO q6h x 5-7d continued at least 2d after afebrile</td>
<td>Tetracycline 500mg PO qid x 5d (start 8-12d post-exposure)</td>
</tr>
<tr>
<td></td>
<td>Doxycycline 100mg PO q12h x 5-7d continued at least 2d after afebrile</td>
<td>Doxycycline 100mg PO bid x 5d (start 8-12d post-exposure)</td>
</tr>
<tr>
<td><strong>Plague</strong></td>
<td>Streptomycin 30mg/kg/d IM in 2 divided doses x 10-14d or Gentamycin 5mg/kg or IV once daily x 10-14d or Ciprofloxacin 400mg IV q12h until clinically improved then 750mg PO bid for total of 10-14d</td>
<td>Doxycycline 100mg PO bid x 7d or duration of exposure</td>
</tr>
<tr>
<td></td>
<td>Doxycycline 200mg IV then 100 mg IV bid, until clinically improved then 100mg PO bid for total of 10-14d</td>
<td>Ciprofloxacin 500mg PO bid x 7d</td>
</tr>
<tr>
<td><strong>Brucellosis</strong></td>
<td>Doxycycline 200mg/d PO plus Rifampin 600mg/d PO x 6wk</td>
<td>Doxycycline 200mg/d PO plus Rifampin 600mg/d PO x 6wk</td>
</tr>
<tr>
<td></td>
<td>Ofloxacin 400 / Rifampin 600mg/d PO x 6wk</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Disease</th>
<th>Chemotherapy</th>
<th>Chemoprophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tularemia</td>
<td>Streptomycin 7.5-10mg/kg IM bid x 10-14d</td>
<td>Doxycycline 100mg PO bid x 14d</td>
</tr>
<tr>
<td></td>
<td>Gentamycin 3-5mg/kg/d IV x 10-14d</td>
<td>Tetracycline 500mg PO qid x 14d</td>
</tr>
<tr>
<td></td>
<td>Ciprofloxacin 400mg IV q12h until improved, then 500mg PO q12h for total of 10-14d</td>
<td>Ciprofloxacin 500mg PO q12h x 14d</td>
</tr>
<tr>
<td></td>
<td>Ciprofloxacin 750mg PO q12h x 10-14d</td>
<td></td>
</tr>
<tr>
<td>Viral Encephalitides</td>
<td>Supportive therapy</td>
<td>NA</td>
</tr>
<tr>
<td>Viral Hemorrhagic Fevers</td>
<td>Ribavirin 30mg/kg IV initial dose; then 16mg/kg IV q6h x 4d; then 8mg/kg IV q8h x 6d</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Passive Antibodies</td>
<td></td>
</tr>
<tr>
<td>Smallpox</td>
<td>Supportive therapy</td>
<td>Vaccinia Ig 0.6mL/kg IM (within 3d of exposure, best within 24h)</td>
</tr>
<tr>
<td>Botulism</td>
<td>DOD heptavalent equine despeciated antitoxin for serotypes A-G, 10mL IV</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>CDC trivalent equine antitoxin for serotypes A, B, E</td>
<td></td>
</tr>
<tr>
<td>Staphylococcus Enterotoxin B</td>
<td>Ventilatory support</td>
<td>NA</td>
</tr>
<tr>
<td>Ricin</td>
<td>Supportive therapy</td>
<td>NA</td>
</tr>
<tr>
<td>T-2 Mycotoxins</td>
<td>None</td>
<td>Decontamination</td>
</tr>
</tbody>
</table>
References Cited


Noji, EK. Disaster planning and operation in the emergency department. In: Schwartz


**Suggested Readings**

**Emergencies**


**Sanitation**


**Standard Operating Procedures**

California Emergency Medical Services Authority Website (Primer on HEICS):

www.emsa.cahwnet.gov/aboutems/brochur.asp

Friedman, Kenneth. Guide to National Safety Data Sheets (MSDS), 1994. In:

www.techstar.com
Structural Vulnerability
