WHO/CDS/2004.24

COMMUNICABLE DISEASE TOOLKIT

LIBERIA

5. GUIDELINES FOR OUTBREAK CONTROL

World Health Organization
Geneva

TABLE 1. STEPS IN MANAGEMENT OF AN OUTBREAK

1. PREPARATION

- Health coordination meetings
- Surveillance system – weekly health reports to WHO
- Stockpiles – specimen kits, appropriate antibiotics, IV fluids
- Epidemic investigation kits
- Contingency plans for isolation wards in hospitals
- Laboratory support

2. DETECTION

If a certain number of cases of any of the following diseases/syndromes is diagnosed (i.e. alert threshold is passed):

- acute watery diarrhoea in individuals over 5 years old
- bloody diarrhoea
- suspected cholera
- measles
- meningitis
- acute haemorrhagic fever syndrome
- acute jaundice syndrome
- acute flaccid paralysis (suspected poliomyelitis)
- a cluster of deaths of unknown origin
- (diseases/syndromes in list to be modified according to country profile)

inform your health coordinator as soon as possible. The health coordinator should inform the Ministry of Health and WHO.

3. RESPONSE

Confirmation

- The lead health agency should investigate reported cases to confirm the outbreak situation – number of cases higher than expected for same period of year and population. Clinical specimens will be sent for testing.
- The lead health agency should activate an outbreak control team with membership from relevant organizations: Ministry of Health, WHO and other United Nations organizations, nongovernmental organizations in the fields of health and water and sanitation, veterinary experts.

Investigation

- Confirm diagnosis (laboratory testing of samples).
- Define outbreak case definition.
- Count number of cases and determine size of population (to calculate attack rate).
- Collect/analyse descriptive data to date (e.g. time/date of onset, place/location of cases and individual characteristics such as age/sex).
- Follow up cases and contacts.
- Determine the at-risk population.
- Formulate hypothesis for pathogen/source/transmission.
- Conduct further investigation/epidemiological studies (e.g. to clarify mode of transmission, carrier, infectious dose required, better definition of risk factors for disease and at-risk groups).
- Write an investigation report (investigation results and recommendations for action).

Control

- Implement control measures specific for the disease and prevent exposure (e.g. isolation of cases in viral haemorrhagic fever outbreak).
- Prevent infection (e.g. immunization in measles outbreak).
- Treat cases as recommended in WHO guidelines.

4. EVALUATION

- Assess timeliness of outbreak detection and response, cost.
- Change public health policy if indicated (e.g. preparedness).
- Write outbreak report and disseminate.

TABLE 2. RESOURCES NEEDED FOR OUTBREAK RESPONSE

- Personnel (trained staff)
- Supplies (e.g. oral rehydration salts, intravenous fluids, water containers, water purifying tablets, drinking cups, vaccines, vitamin A, monitoring forms, vaccination cards, tally sheets)
- Treatment facilities (location, beds available, stocks of basic medical supplies)
- Laboratory facilities (location, capacity, stocks of reagents, etc.)
- Transport (sources of emergency transport and fuel, cold chain)
- Communication links (between health centres; between Ministry of Health, nongovernmental organizations and United Nations agencies)
- Computers (not essential)
- In an outbreak requiring an immunization campaign:
  - safe injection equipment (e.g. auto-destruct syringes and safety boxes (puncture-resistant boxes)
  - immunization facilities (location, capacity)
  - cold chain equipment (number and condition of refrigerators, cold boxes, vaccine carriers, ice-packs)

TABLE 3. RISK FACTORS FOR OUTBREAKS IN EMERGENCY SITUATIONS

Acute respiratory infections	Inadequate shelter with poor ventilation Indoor cooking, poor health care services Malnutrition, overcrowding Age group under one year old Large numbers of elderly Cold weather
Diarrhoeal diseases	Overcrowding Inadequate quantity and/or quality of water Poor personal hygiene Poor washing facilities Poor sanitation Insufficient soap Inadequate cooking facilities
Malaria	Mass population movement with increased vulnerability of displaced populations because of malnutrition, concomitant diseases, settlement in marginal areas close to mosquito breeding sites, housing in temporary shelters with increased exposure to mosquito bites, increased population density promoting malaria transmission. Poor access to health care (curative and preventive), combined with breakdown of health services, existing health facilities overwhelmed. Interruption of vector control activities Environmental degradation encouraging vector breeding
Measles	Measles immunization coverage rates below 80% in country of origin Population movement Overcrowding
Meningococcal meningitis	Meningitis belt. Dry season Dust storms Overcrowding High rates of acute respiratory infections

TABLE 3 (*continued*)

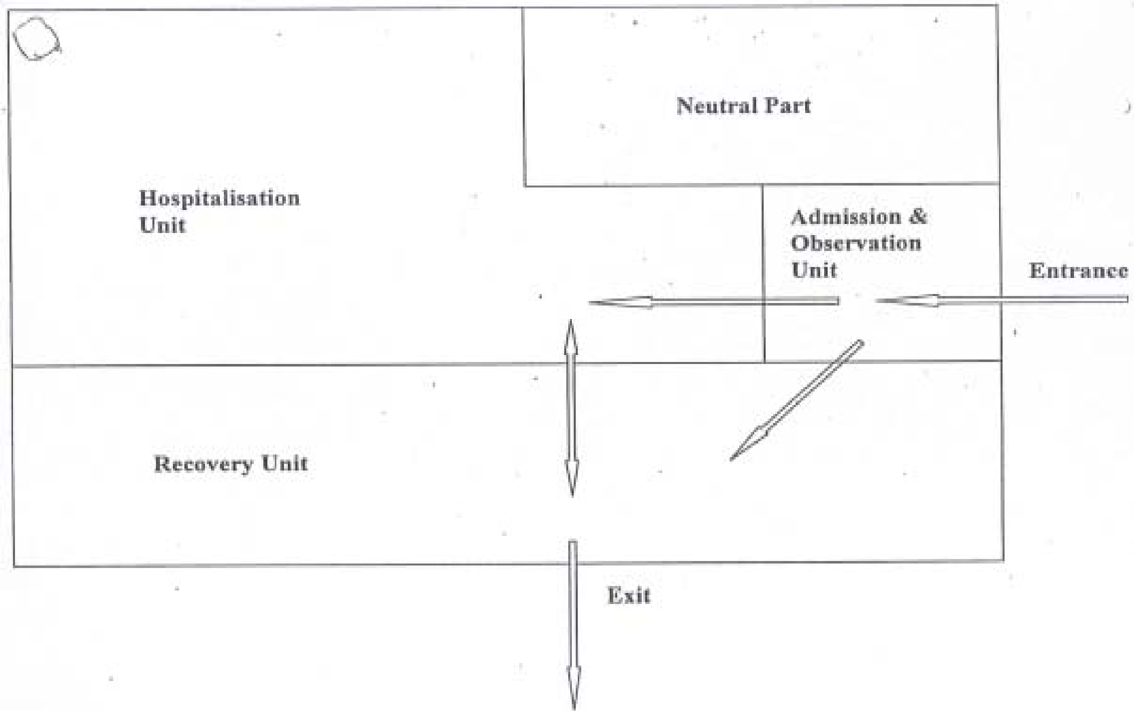
Viral haemorrhagic fever	Lack of hygiene, poor sanitation, contact with objects/food contamined with rodent excreta; unsafe food handling and storage practices (Lassa fever). Population displacement with subsequent overcrowding. Poor access to health services, poor isolation and protection measures (barrier nursing). Tick-infested areas (Crimean–Congo haemorrhagic fever) Handling or eating ill or dead infected primates (Ebola) or rodents (Lassa fever).
Yellow fever	Unvaccinated people moving to areas of endemicity are at risk. Overcrowding Open water storage provides favorable habitat for *Ae. aegypti* Old tyres, old water containers increase vector breeding Poor drainage leading to pools and open channels of water) may increase vector-breeding opportunities.

TABLE 4. ESSENTIAL HYGIENE RULES IN CHOLERA TREATMENT CENTRE

Mode of transmission	Essential rules in the unit	Additional recommended rules
People	• Access limited to patient + one family member + staff • One-way flow of people	• Ideally, only one carer per patient • Three separate spaces within unit (see Figure 1)
Water	• Safe water (chlorination concentration according to specific use; see Table 5) • Large quantity needed (minimum 10 litres/person per day)	• Ideally 50 litres/patientper day
Hands	• Hand-washing stations with safe water and soap in sufficient quantities • Wash hands with water and soap – before and after taking care of patients – after using the latrines – before cooking or eating – after leaving the admission ward	• Cut and clean nails
Food	• Cooked food • Health care workers should not handle food or water	• Food provided by the unit (preferably not by families) • Large stocks of food may be "tempting "and may lead to security problems
Clothes	• Wash clothes and linen with the appropriate chlorine solution	• If no chlorine available, wash clothes with soap and dry them in the sun
Environmental contamination (faeces and waste)	• Ensure exclusive latrines for the unit • Disinfect buckets, soiled surfaces and latrines regularly with the appropriate chlorine solution (see Table 5) • Incinerator for medical waste	• Latrines at least 100 metres away from wells or surface sources • Special cholera beds
Corpses	• Separate morgue • Disinfect corpses (see Table 5)	• Find ways to have safe funeral practices • Bury corpses as soon as possible

Developed by WHO Global Task Force on Cholera Control

FIGURE 1



Four **separate** spaces:

- Admission and observation unit
- Neutral Part: Staff office and staff rest room, hospital Kitchen, store rooms
- Hospitalisation unit : reserved for severe patients with IV fluids
- Recovery unit : Oral Rehydration space

In **each** space :ensure exclusive latrines , washing areas , large quantity of water and safe disposal of waste

Cholera bed in wood and rope

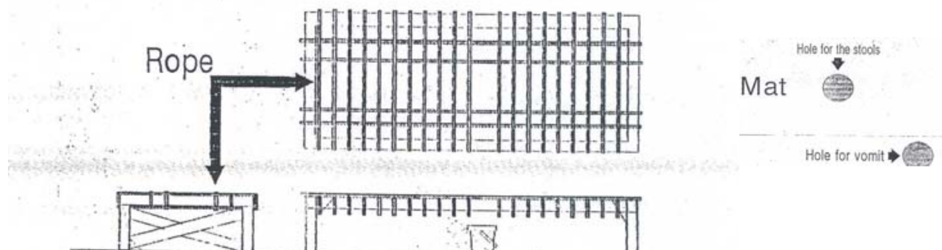


TABLE 5. PREPARATION AND USE OF DISINFECTANTS

Starting with:	**2% Solution**	**0.2% Solution**	**0.05% Solution**
Calcium hypochlorite at 70% active chlorine (“high-test hypochlorite”, “HTH”)	30 g/litre or 2 tablespoons/litre	30 g/10 litres or 2 tablespoons/10 litres	7 g/10 litres or ½ tablespoon/10 litres
Chlorinated lime at 30% active chlorine (“bleaching powder”)	66 g/litre or 4 tablespoons/litre	66 g/10 litres or 4 tablespoons/10 litres	16 g/10 litres or 1 tablespoon/10 litres
Sodium hypochlorite solution at 6% active chlorine (“household bleach”)	333 ml/litre or 22 tablespoons/litre	333 ml/10 litres or 22 tablespoons/10 litres	83 ml/10 litres or 5 tablespoons/10 litres
USE FOR DISINFECTION OF:	Excreta Corpses Shoes	Floor Utensils Beds	Hands Skin Clothes

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Approximate measurements
1 teaspoon = 5 ml
1 tablespoon = 15 ml,or 3 tea spoons

Do not use metallic bucket for preparation and storage of chlorinated solutions.

TABLE 6. CHOLERA TREATMENT SUPPLIES PER POPULATION

How to estimate the initial amount of supplies needed for a cholera outbreak
(0.2% of the population expected to fall ill initially).

The table below gives an estimate of the amount of supplies you will need according to the number of people in your area. To find the amounts needed for each item, look in the column under the approximate population of your catchment area (to the nearest 5000). You may add several columns (e.g. if your health facility serves 35 000 people, add the amounts in the 10 000 and 5000 columns to those in the 20 000 column). Write the amount needed at your health facility in the empty column on the right.

On the basis of drug resistance in your area, choose only one of the antibiotics.

Item	**Population** (+ *numbers expected to fall ill)*						Your area
	5000 *(10)*	10 000 *(20)*	15 000 *(30)*	20 000 *(40)*	50 000 *(100)*	100 000 *(200)*	
Rehydration supplies							
ORS packets (for 1 litre each)	65	130	195	260	650	1 300	
Nasogastric tubes (adults) 5.3/3.5 mm (16 Flack) 50 cm	1	1	1	2	3	6	
Nasogastric tubes (children)	1	1	1	2	3	6	
Ringer's lactate bags, 1 litre, with giving sets	12	24	36	48	120	240	
Scalp vein sets	2	3	4	5	10	20	
Antibiotics							
Doxycycline, 100 mg (adults)	6	12	18	24	60	120	
Erythromycin 250 mg (children)	24	48	72	96	240	480	
Other treatment supplies							
Large water dispensers with tap (marked at 5–10 litres)	1	1	1	2	2	4	
1-litre bottles for ORS solution	2	4	6	12	20	40	
0.5-litre bottles for ORS solution	2	4	6	12	20	20	
Tumblers, 200 ml	4	8	12	16	40	80	
Teaspoons	2	4	6	8	20	40	
Cotton wool, kg	1/2	1	11/2	2	5	10	
Adhesive tape, reels	1	1	1	2	3	6	

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TABLE 7. DYSENTERY TREATMENT SUPPLIES PER POPULATION

How to estimate the amount of supplies needed for a Dysentery outbreak:
(0.2% of the population expected to fall ill initially).

The table below gives an estimate of the amount of supplies you will need according to the number of people in your area. To find the amounts needed for each item, look in the column under the approximate population of your catchment area (to the nearest 5000). You may add several columns (e.g. if your health facility serves 35 000 people, add the amounts in the 10 000 and 5000 columns to those in the 20 000 column). Write the amount needed at your health facility in the empty column on the right.

On the basis of drug resistance in your area, choose only one of the antibiotics.

Item	**Population** (+ *numbers expected to fall ill*)						Your area
	5000 *(10)*	10 000 *(20)*	15 000 *(30)*	20 000 *(40)*	50 000 *(100)*	100 000 *(200)*	
Rehydration supplies							
ORS packets (for 1 litre each)	10	20	30	40	100	200	
Ringer's lactate bags, 1 litre, with giving sets	2	4	6	8	20	40	
Scalp vein sets	1	1	2	2	5	10	
Antibiotics							
Nalixidic acid, 500 mg (adults)	320	480	960	1280	3200	6400	
Nalixidic acid, 250 mg (children)	80	160	240	320	800	1600	
Ciprofloxacin, 500 mg	100	200	300	400	1000	2000	
Other treatment supplies							
Large water dispensers with tap (marked at 5–10 litres)	1	1	1	1	1	2	
1-litre bottles for ORS solution	1	1	2	2	5	10	
0.5-litre bottles for ORS solution	1	1	2	2	5	10	
Tumblers, 200 ml	1	2	3	4	10	20	
Teaspoons	1	1	2	2	5	10	
Cotton wool, kg	1/2	1	1 1/2	2	5	10	
Adhesive tape, reels	1	1	1	2	3	6	
Hand soap, kg	2	4	6	8	20	40	
Boxes of soap for washing clothes	3	6	9	12	30	60	
1-litre bottle of cleaning solution (2% chlorine or 1–2% phenol)	1	1	1	1	2	4	

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TABLE 8. TYPHOID FEVER TREATMENT SUPPLIES PER POPULATION

How to estimate the amount of supplies needed for a Typhoid outbreak:
(0.2% of the population expected to fall ill initially).

The table below gives you an estimate of the amount of supplies you will need according to the number of people in your area. To find the amounts needed for each item, look in the column under the approximate population of your catchment area (to the nearest 5000). You may add several columns (e.g. if your health facility serves 35 000 people, add the amounts in the 10 000 and 5000 columns to those in the 20 000 column). Write the amount needed at your health facility in the empty column on the right.

On the basis of drug resistance in your area, choose only one of the antibiotics.

Item	**Population** (+ *numbers expected to fall ill*)						Your area
	5000 *(10)*	10 000 *(20)*	15 000 *(30)*	20 000 *(40)*	50 000 *(100)*	100 000 *(200)*	
Rehydration supplies							
ORS packets (for 1 litre each)	**10**	**20**	**30**	**40**	**100**	**200**	
Ringer's lactate bags[a] 1 litre, with giving sets	1	2	3	4	10	20	
Scalp vein sets	1	1	2	2	5	10	
Antibiotics							
Chloramphenicol , 250 mg	2500	5000	7500	10000	25000	50000	
Amoxicillin, 500 mg	1680	3360	5040	6720	16800	33600	
Co-trimoxazole, (SMX 400 mg + TMP 80 mg)	840	1680	2520	3360	8400	16800	
Cefixime, 200 mg [b]	840	1680	2520	3360	8400	16800	
Other treatment supplies							
Large water dispensers with tap (marked at 5–10 litres)	1	1	1	1	1	2	
1-litre bottles for ORS solution	1	1	2	2	5	10	
0.5-litre bottles for ORS solution	1	1	2	2	5	10	
Tumblers, 200 ml	1	2	3	4	10	20	
Teaspoons	1	1	2	2	5	10	
Cotton wool, kg	1/2	1	11/2	2	5	10	
Adhesive tape, reels	1	1	1	2	3	6	
Hand soap, kg	2	4	6	8	20	40	
Boxes of soap for washing clothes	3	6	9	12	30	60	
1-litre bottle of cleaning solution (2% chlorine or 1–2% phenol)	1	1	1	1	2	4	

[a]Considering that less than 50% of the patients need IV rehydration
[b]In case of multidrug resistance to above antibiotics, choose cefixime.

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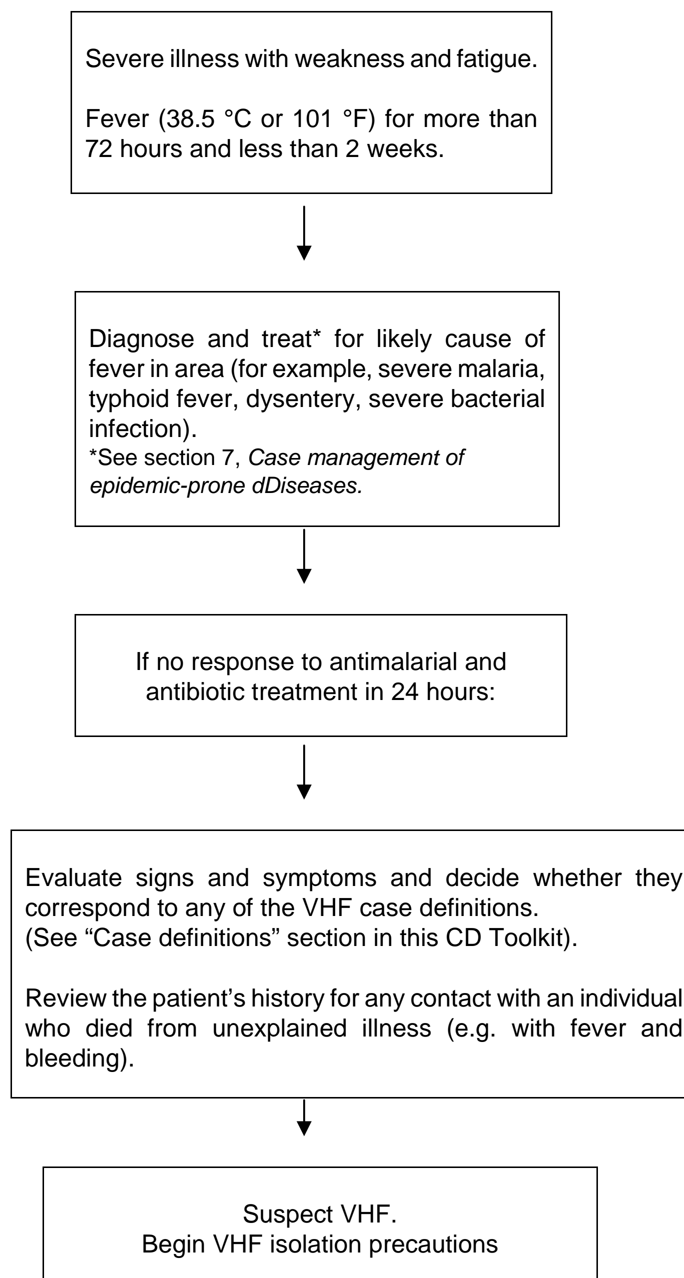
ANNEX 1
VIRAL HAEMORRHAGIC FEVER OUTBREAK CONTROL

Identify suspected cases of viral haemorrhagic fever (VHF).



*The above flowchart applies to the first steps for VHF outbreak investigation

As soon as a VHF is suspected, VHF isolation precautions should begin. This will help to reduce the number of people exposed to the disease.

USE INFORMATION FROM PREVIOUS OUTBREAKS TO SUSPECT A VHF

Talk with the district or national surveillance officer about VHFs that have been reported in your area. Report suspected cases of VHF according to national surveillance guidelines to the corresponding health authorities.

Begin VHF isolation precautions

- Adapt VHF isolation precautions as needed.
- Designate the health officer who will coordinate VHF isolation precautions. As soon as a health care worker suspects a VHF, he or she should notify the health facility administrator and the VHF co-ordinator who will:
  - refer the patient to the isolation area and take the necessary steps to begin VHF isolation precautions as described below;
  - limit the number of health facility staff and visitors in the patient's room;
  - limit the use of invasive procedures and reduce the number of injectable medications.

Important! Between the time when VHF is suspected and the time when the patient is received in the isolation area, there is a risk for disease transmission from the patient's blood and other body fluids (stool, urine, vomitus). Prevent disease transmission to other patients, visitors and health staff in the waiting area by placing the suspected VHF patient apart from other patients. Make every effort to reduce this waiting time.

➢ *Reinforce standard universal precautions in the health centre/hospital.*

VHF isolation precautions

Isolation precautions can be started even when if the diagnosis has not been laboratory-confirmed.

- Isolate the patient.
- Wear protective clothing in the isolation area, in the cleaning and laundry areas and in the laboratory. Wear a scrub-suit, gown, apron, two pairs of gloves, mask, headcover, eyewear, and rubber boots.
- Clean and disinfect spills, waste, and reusable equipment safely.*
- Clean and disinfect soiled linens and laundry safely.*
- Use safe disposal methods for non-reusable supplies and infectious waste.
- Provide information about the risk of VHF transmission to health facility staff. Emphasize and ensure the use of VHF isolation precautions with all health facility staff.
- Provide information to families and the community about prevention of VHFs and care of patients.

  *Pour or soak in 0.5% chlorine solution; see "Guidelines for collection of specimens for laboratory testing" in this Communicable Disease Toolkit (WHO/CDS/2003.24).

See: Annex 2, *Select the isolation area*, below.

Identify patient's contacts and travel history

Ask the patient (or a family member who can answer for the patient) questions on the following topics:
- Place where currently living.
- Other persons with the same symptoms in the family or village.
- Which places the patient has visited in the past 3 weeks.

Use the answers to identify contacts. Provide the contacts with information about VHF and when to seek care.

Specimen samples for laboratory confirmation

According to the suspected VHF, obtain specimens for confirmation of diagnosis. (See “Guidelines for collection of specimens for laboratory testing” in this Toolkit for specific techniques for collecting blood and other specimens from suspected VHF cases and their method of transport.)

All suspected cases should be reported and laboratory specimens given to the corresponding health authority (surveillance officer or WHO officer) or person responsible for coordinating epidemic control and transporting/shipping of the sample to the appropriate reference laboratory and for follow-up of results.

Alert health facility staff about specific risks for VHF transmission

- As soon as a VHF is suspected, alert the relevant health staff to start using VHF isolation precautions. This applies especially to:
  - doctors or nurses providing direct patient care;
  - cleaning, laundry, and waste disposal staff who clean and disinfect contaminated material and supplies;
  - laboratory staff who handle samples from the suspected VHF cases;
  - medical or support staff who prepare or handle the bodies of VHF patients who die.

- Explain how VHF transmission can occur in the health facility and the risks to health facility staff. Remind the staff that VHF is a highly infectious disease. They must use VHF isolation precautions whenever they have contact with a VHF patient, the patient’s blood or other body fluids, or contaminated supplies and equipment.

ANNEX 2
SELECT THE ISOLATION AREA

Establish a barrier between the VHF patient and uninfected patients, other health facility staff, and visitors.

Description

- A single room with an adjoining toilet or latrine.
- A separate building or ward that can be used for VHF patients only (especially if Ebola haemorrhagic fever is suspected, or if there is a large number of patients).
- An area in a larger ward that is separate and far away from other patients in the ward.

Important! There should be an isolated toilet, adequate ventilation, and screened windows.

Place a security barrier around the isolation area and restrict access. Place signs around the isolation area clearly stating that access is restricted.

Set up changing rooms for staff providing patient care

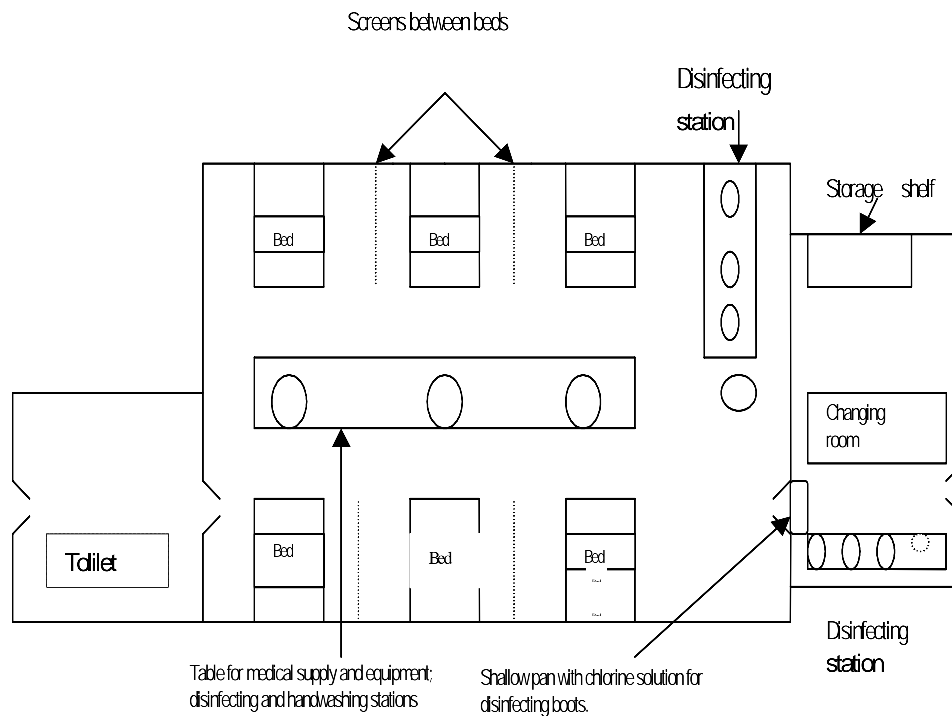
One changing room is needed outside the patient isolation area. This is where health care workers will put on protective clothing. Contaminated clothing and supplies remain in the changing room until cleaning staff – trained to use VHF isolation precautions – take the VHF-contaminated items to the laundry or disposal site.

If there are family members who will assist with direct patient care, give them information and training about:

– the risk of VHF transmission and the reason for protective clothing;
– how to wear gloves, gowns, and a mask;
– how to take off gloves, gowns, and mask and store them or dispose of them safely.

FIGURE 2. VHF ISOLATION AREA EXAMPLE

A sample layout for several viral haemorrhagic fever patients.



ANNEX 3
SAFE FUNERAL PRACTICES:

The bodies and body fluids of deceased VHF patients remain contagious for several days after death. Family and community members are also at risk if funeral practices involve touching and washing the body.

Prepare the body safely

The funeral should take place as soon as possible after the body is prepared in the health facility and health facility staff should:

– prepare the body safely;
– be aware of the family's cultural practices and religious beliefs, and help the family to understand why some practices cannot be observed because they place the family or others at risk for exposure and death.

To prepare the body in the health facility:

1. Wear protective clothing as recommended for staff in the patient isolation area. Use thick rubber gloves as the second pair (or outer layer) of gloves.
2. Spray the body and the area around it with a 0.5% chlorine solution.*
3. Place the body in a body bag (mortuary sack) and close it securely. Spray the body bag with a 0.5% chlorine solution.*
4. If a body bag is not available, wrap the body in two thickness of cotton cloth soaked with a 0.5% chlorine solution.* Then wrap the body in plastic sheeting. Seal the wrapping with plastic tape. Spray the body bag as in Step 3. Place the body in a coffin if one is available.
5. Transport the body to the burial site as soon as possible. Assign a health officer or a member of the health facility staff to accompany the body to ensure that the safety precautions continue to be observed during the journey.

*See Annex 8 in "Guidelines for collection of specimens for laboratory testing" in this Communicable Disease Toolkit for Liberia (WHO/CDS/2003.24).

Prepare burial site

- The grave should be at least 2 metres deep.
- Carefully explain to the family the reason for limiting attendance at the funeral ceremony to family only.

Disinfect the vehicle after transporting the body

- The staff member who disinfects the vehicle must wear protective clothing.
- Rinse the interior of the vehicle in which the body was carried with a 0.5% chlorine solution* and let it soak for 10 minutes.
- Rinse well with clean water and let the vehicle air-dry.