Democratic Republic of the Congo
Democratic Republic of the Congo

1. Health surveillance forms
2. Surveillance system guidelines and alert thresholds
3. Case definitions
4. Guidelines for outbreak control
5. Case management of epidemic-prone diseases
6. Guidelines for collection of specimens for laboratory testing
7. Outbreak investigation kit
Democratic Republic of the Congo

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7. Outbreak investigation kit
## 1. WEEKLY MORBIDITY FORM

| County: ................................................. | District/Zone: ...................................... |
| Community/Settlement/Camp: ................................ | Health facility: ...................................... |
| Agency: .................................................. | Reporting period: From Monday ……/……/…….. To Sunday ……/……/……… |
| Total population covered: .............................. | Under-5 population: ................................. |

### DISEASE / SYNDROME

<table>
<thead>
<tr>
<th>NEW CASES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 5 years</td>
</tr>
<tr>
<td>Acute watery diarrhoea (incl. suspected *cholera)</td>
</tr>
<tr>
<td>Acute bloody diarrhoea (incl. suspected *shigellosis)</td>
</tr>
<tr>
<td>* Acute flaccid paralysis (suspected poliomyelitis)</td>
</tr>
<tr>
<td>* Acute haemorrhagic fever syndrome</td>
</tr>
<tr>
<td>* Acute jaundice syndrome (including *yellow fever)</td>
</tr>
<tr>
<td>* Measles</td>
</tr>
<tr>
<td>* Meningitis – suspected</td>
</tr>
<tr>
<td>* Neonatal tetanus</td>
</tr>
<tr>
<td>Acute lower respiratory infection/pneumonia</td>
</tr>
<tr>
<td>Malaria</td>
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<tr>
<td>– suspected</td>
</tr>
<tr>
<td>– confirmed (rapid test/smear)</td>
</tr>
<tr>
<td>Fever of unknown origin</td>
</tr>
<tr>
<td>Sexually transmitted infections</td>
</tr>
<tr>
<td>Tuberculosis – suspected</td>
</tr>
<tr>
<td>Severe malnutrition</td>
</tr>
<tr>
<td>Trauma/injury</td>
</tr>
<tr>
<td>Others</td>
</tr>
</tbody>
</table>

### TOTAL NUMBER OF CONSULTATIONS

- Count new cases only.
- Count the primary disease/syndrome only.
- If no cases, write 0.
- Review “Emergency phase surveillance system Democratic Republic of the Congo: case definitions”.

* Report these diseases and any cases of suspected cholera or suspected shigellosis immediately to your health coordinator or field surveillance officer using CASE-BASED REPORTING FORM. Alert thresholds for other diseases/syndromes are provided in WHO “Emergency phase surveillance system Democratic Republic of the Congo: guidelines for use of health surveillance forms”.

---

*For use by data management office*

Form received: ___/___/___ Validated ☐ Entered ☐ Record number:
2. WEEKLY MORTALITY FORM

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Address</th>
<th>Sex</th>
<th>Age*</th>
<th>Cause of death</th>
<th>Date of death</th>
<th>Place** of death</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

*Age in months. ** Place – either home (H) or health facility (HF).

For use by data management office

Form received: ___/___/___ Validated □ Entered □ Record number:
### 3. DEMOCRATIC REPUBLIC OF THE CONGO MONTHLY MORBIDITY FORM

|----------------------------------|-------------------|--------------------|------------------|-------------------|------------------------------|-----------|

<table>
<thead>
<tr>
<th>Catchment Population:</th>
<th>Under-5 population:</th>
<th>Name of reporting officer:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>DISEASE / SYNDROME</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>Acute diarrhoea</td>
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<tr>
<td>*Acute watery diarrhoea</td>
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<tr>
<td>*Bloody diarrhoea</td>
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<td>*VHF – suspected</td>
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<td>*Measles</td>
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<tr>
<td>*Meningitis – suspected</td>
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<tr>
<td>*AFP (suspected poliomyelitis)</td>
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<tr>
<td>*Acute jaundice syndrome</td>
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<td>(including yellow fever)</td>
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<td>ALRI / pneumonia</td>
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<td>Malaria – suspected</td>
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<td>Neonatal tetanus</td>
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<td>Tuberculosis – suspected</td>
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<tr>
<td>Fever of unknown origin</td>
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<td>Noncommunicable diseases</td>
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<td>Others</td>
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<tr>
<td>TOTAL NUMBER OF CONSULTATIONS</td>
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</tbody>
</table>

*Diseases with outbreak potential – report as soon as possible to your district surveillance officer and provisional medical officer or health coordinator using outbreak alert form. See alert thresholds in “Guidelines for use of health surveillance forms”.

For use by data management office: Form received: __/__/___ Validated ☐ Entered ☐ Record number: _
### 4. DEMOCRATIC REPUBLIC OF THE CONGO MONTHLY MORTALITY FORM

**District:** ……………………………   **Province/Section:** ……………………………
**Town/Village/Camp:** ………………………………
**Health facility:** ………………………   **Supporting agency:** ……………………
**Reporting period:** From Monday ……/……/…….. To Sunday ……/……/……..
**Catchment population:** ………………………
**Under-5 population:** ………………………
**Name of reporting officer:** ……………………………………… ..

<table>
<thead>
<tr>
<th>No.</th>
<th>First and middle names</th>
<th>Family name</th>
<th>Sex</th>
<th>Age (mos / yrs)</th>
<th>Fever</th>
<th>Cough</th>
<th>Bloody Diarrhoea</th>
<th>Watery Diarrhoea</th>
<th>Specified cause or main symptoms if unknown</th>
<th>Unknown</th>
<th>Neonatal death §</th>
<th>Maternal death §</th>
<th>Malnutrition</th>
<th>Other (specify)</th>
<th>Date of death dd/mm/yy</th>
<th>Location of death</th>
<th>Lab</th>
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</tbody>
</table>

§ see list of "Case definitions ".

# If this box is ticked, also specify cause in the "specify cause" column. Example, if cholera is suspected as the cause of the acute watery diarrhoea death, tick the acute watery diarrhoea column and write "cholera" in "specify cause" column.

For use by data management office: Form received: ___/___/___ Validated □ Entered □ Record number: ___
### 5. DEMOCRATIC REPUBLIC OF THE CONGO

#### OUTBREAK ALERT FORM

<table>
<thead>
<tr>
<th>District:</th>
<th>Province/Section:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Province/Section:</td>
<td></td>
</tr>
<tr>
<td>Town/Village/Camp:</td>
<td></td>
</tr>
<tr>
<td>Health facility:</td>
<td>Supporting agency:</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Date:</td>
<td></td>
</tr>
<tr>
<td>Name of reporting officer:</td>
<td></td>
</tr>
</tbody>
</table>

**Symptoms and signs:**
- [ ] Acute watery diarrhoea
- [ ] Bloody diarrhoea
- [ ] Fever
- [ ] Rash
- [ ] Cough
- [ ] Vomiting
- [ ] Neck stiffness
- [ ] Jaundice
- [ ] Sore throat
- [ ] Bleeding
- [ ] Acute paralysis or weakness
- [ ] Other: _______________________________

**Suspected disease/syndrome:**
- [ ] Acute watery diarrhoea
- [ ] Bacillary dysentery/shigellosis
- [ ] Cholera
- [ ] Measles
- [ ] Meningitis
- [ ] Malaria
- [ ] Ebola and Marburg viral haemorrhagic fever (VHF)
- [ ] Yellow Fever
- [ ] Poliomyelitis
- [ ] Typhoid fever
- [ ] Unknown disease
- [ ] Other: _________________________

**Total number of cases reported:**

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>Age</th>
<th>Sex</th>
<th>Location</th>
<th>Date of onset</th>
<th>Laboratory specimen taken (yes/no)</th>
<th>Treatment given</th>
<th>Outcome(^a)</th>
<th>Final classification(^b)</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

\(^a\) Outcome: I = currently ill, R = Recovering or recovered, D = died.
\(^b\) Final classification: S = suspected case with clinical diagnosis, C = confirmed case with laboratory diagnosis.
### 6. DEMOCRATIC REPUBLIC OF THE CONGO
OUTBREAK INVESTIGATION FORM

<table>
<thead>
<tr>
<th>District: ....................</th>
<th>Province/Section: ..........................</th>
</tr>
</thead>
<tbody>
<tr>
<td>Town/Village/Camp: ...........</td>
<td>..............................................</td>
</tr>
<tr>
<td>Health facility: ...............</td>
<td>Supporting agency: ..................................</td>
</tr>
<tr>
<td>Date: ........../......./.......</td>
<td>..............................................</td>
</tr>
<tr>
<td>Name of reporting officer: .................</td>
<td>..............................................</td>
</tr>
</tbody>
</table>

#### 1. PATIENT IDENTIFICATION

<table>
<thead>
<tr>
<th>Case no: ................................</th>
<th>Name: ..............................................</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location in village or site: ..................................................................</td>
<td></td>
</tr>
<tr>
<td>Date of birth: ______ / ______ / ______</td>
<td>Age: ______</td>
</tr>
</tbody>
</table>

#### 2. CLINICAL DATA

- Date of onset of illness: ______ / ______ / ______
- [ ] Acute watery diarrhoea
- [ ] Bloody diarrhoea
- [ ] Fever
- [ ] Rash
- [ ] Cough
- [ ] Vomiting
- [ ] Neck stiffness
- [ ] Jaundice
- [ ] Sore throat
- [ ] Bleeding
- [ ] Acute paralysis or weakness
- [ ] Other: ________________________________________

#### 3. LABORATORY DATA

<table>
<thead>
<tr>
<th>Sample: ................................</th>
<th>Date taken: ______ / ______ / ______</th>
<th>Lab. received: ______ / ______ / ______</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of laboratory: .................</td>
<td>...............................................</td>
<td></td>
</tr>
<tr>
<td>Type of test: ..................</td>
<td>Date of results: ______ / ______ / ______</td>
<td>Result: Pos. Neg.</td>
</tr>
</tbody>
</table>

#### 4. FINAL CLASSIFICATION

- [ ] Laboratory
  - Date of final diagnosis: ______ / ______ / ______
- [ ] Clinical case
  - Discarded final diagnosis: ..............................................

#### 5. FIELD INVESTIGATOR

| Name: .............................................. | Position: .............................................. | Signature: .............................................. |

**NOTE:** ONE FORM PER CASE INVESTIGATED
Democratic Republic of the Congo

1. Health surveillance forms

2. Surveillance system guidelines and alert thresholds

3. Case definitions

4. Guidelines for outbreak control

5. Case management of epidemic-prone diseases

6. Guidelines for collection of specimens for laboratory testing

7. Outbreak investigation kit
PURPOSE
These surveillance forms are for use in Democratic Republic of the Congo. Included are: a monthly morbidity form, a monthly mortality form, an outbreak alert form and a case investigation form.

They aim to provide early warning of outbreaks of the following major communicable diseases:
- bacillary dysentery
- cholera
- Ebola and Marburg viral haemorrhagic fever (VHF)
- measles
- meningococcal meningitis
- poliomyelitis
- typhoid fever
- yellow fever

In addition to the above outbreak-prone diseases, the main health problems are likely to be:
- malaria
- lower respiratory tract infection/pneumonia
- malnutrition

REPORTING MECHANISMS
In each health facility, a daily register of consultations should be kept. Suggested layout of register in health facility:

<table>
<thead>
<tr>
<th>OPD no</th>
<th>Date</th>
<th>Name</th>
<th>Location</th>
<th>Sex</th>
<th>DOB</th>
<th>New case/ follow up</th>
<th>Diagnosis</th>
<th>Treatment</th>
<th>Outcome</th>
</tr>
</thead>
</table>

- One person in each health facility should be identified as responsible for data collection and notification of potential epidemics to the District Surveillance Officer or Provisional Medical Officer (DMO). One person should be responsible for compiling the data from the daily register for the Weekly Morbidity Report.

- The monthly morbidity report should be filled out on a weekly basis from Monday to Sunday and compiled by the in-charge officer in a timely manner.

HOW TO FILL IN THE MONTHLY MORBIDITY REPORT
- Data should be recorded in two age categories: under 5 years and 5 years and over.
- New cases/consultations requested for communicable and noncommunicable diseases.
- All cases attending the health facility should be recorded on the Monthly Morbidity Report, including those who are subsequently referred to hospital.
- The first consultation only should be reported; follow-up visits for the same disease should not be reported.
At the end of each week, the reporting officer must count up all the cases and deaths from each disease as recorded in the outpatient and inpatient records. The health worker must select the main cause for the consultation, i.e. one disease/syndrome for each case.

If one of the diseases has epidemic potential marked with an asterisk on the form, record this disease as the main cause of consultation.

“Other communicable diseases” include all cases of communicable diseases not mentioned in the list of diseases e.g. skin infections.

“Other noncommunicable diseases” include all cases of noncommunicable diseases not mentioned in the list of diseases, e.g. gastrointestinal problems, heart disease, diabetes.

Diseases for immediate reporting are marked with an asterisk (*) on the morbidity form. They must be reported to your district surveillance officer or DMO using the outbreak alert form if the weekly alert thresholds below are passed (see box on alert thresholds below).

Other diseases/syndromes must be alerted to your health coordinator or supervisor if the weekly alert thresholds specified in the box are reached. If alert thresholds are passed, surveillance activities may need to be enhanced. If the number of cases of a disease/syndrome increases – such as in the event of an outbreak of meningitis or cholera for example – active case-finding and case definitions may need to be reviewed.

HOW TO FILL IN THE MONTHLY MORTALITY FORM:
— This form is a line-listing of all deaths.
— Fill in all the details as required for each case including names, age, sex, date and location of death and laboratory sample taken, and record a main cause of death for each entry even if “unknown”.

Calculations of mortality rates can be performed as follows:

<table>
<thead>
<tr>
<th>Crude mortality rate (CMR):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of deaths for the month / total population at the end of the month x 1000 persons = deaths/1000 persons/month</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Under-5 mortality rate (U5MR):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of deaths among children aged &lt;5 years for the month / under 5-year population at the end of the month x 1000 persons = deaths/1000 persons/month</td>
</tr>
</tbody>
</table>

Alert thresholds for mortality are shown in the box below.
DISEASES/SYNDROMES FOR IMMEDIATE REPORTING
ALERT THRESHOLDS PER WEEK

<table>
<thead>
<tr>
<th>Disease/Syndrome</th>
<th>Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute watery diarrhoea:</td>
<td>5 cases in the 5 years and over age group</td>
</tr>
<tr>
<td>Bloody diarrhoea:</td>
<td>5 cases or 1.5 times the baseline</td>
</tr>
<tr>
<td>Malaria:</td>
<td>1.5 times the baseline</td>
</tr>
<tr>
<td>Measles:</td>
<td>1 case</td>
</tr>
<tr>
<td>Meningitis - suspected:</td>
<td>5 cases or 1.5 times the baseline</td>
</tr>
<tr>
<td>VHF – suspected:</td>
<td>1 case</td>
</tr>
<tr>
<td>Yellow fever – suspected:</td>
<td>1 case</td>
</tr>
<tr>
<td>AFP (suspected poliomyelitis):</td>
<td>1 case</td>
</tr>
<tr>
<td>Neonatal tetanus:</td>
<td>1 case</td>
</tr>
<tr>
<td>Fever of unknown origin:</td>
<td>1.5 times the baseline</td>
</tr>
<tr>
<td>Other communicable diseases:</td>
<td>1.5 times the baseline</td>
</tr>
<tr>
<td>Severe malnutrition:</td>
<td>3 cases</td>
</tr>
<tr>
<td>CMR:</td>
<td>&gt;1/10 000/day (i.e. &gt; 2.8/1000/month)</td>
</tr>
<tr>
<td>U5MR:</td>
<td>&gt;2/10 000/day (i.e. &gt; 5.6/1000/month)</td>
</tr>
</tbody>
</table>

Baseline = average weekly number of cases of the disease calculated over the past 3 weeks.

Use Alert form to report to District Surveillance Officer and DMO if one of these thresholds is reached in a week.
Democratic Republic of the Congo

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WHO-RECOMMENDED CASE DEFINITIONS

ACUTE WATERY DIARRHOEA

Three or more abnormally loose or fluid stools in the past 24 hours with or without dehydration.

Suspected cholera case:
Person aged over 5 years with severe dehydration or death from acute watery diarrhoea with or without vomiting.
Person aged over 2 years with acute watery diarrhoea in an area where there is a cholera outbreak.

To confirm case:
Isolation of *Vibrio cholera* O1 or O139 from diarrhoeal stool sample.

BLOODY DIARRHOEA

Person with acute diarrhoea with visible blood in the stool.

Suspected shigellosis case:
Any person with acute diarrhoea, visible blood in the stool and fever.

Confirmed shigellosis case:
Isolation of *Shigella dysenteriae* type 1 through stool culture and serology from a suspected case.

To confirm case of epidemic bacillary dysentery:
Take stool specimen for culture and blood for serology. Isolation of *Shigella dysenteriae*.

MEASLES

Person with fever and maculopapular rash (i.e. non-vesicular) and cough, coryza (i.e. runny nose) or conjunctivitis (i.e. red eyes)

or

Any person in whom a clinical health worker suspects measles infection.

To confirm case:
Presence of measles-specific IgM antibodies.

MENINGITIS

Suspected meningitis case:
Sudden onset of fever (>38.0 °C axillary) and one of the following:

- neck stiffness
- altered consciousness
- other meningeal sign or petechial/purpural rash

In children aged <1 year meningitis is suspected when fever is accompanied by a bulging fontanelle.

Confirmed meningitis case:
A suspected case with laboratory confirmation through positive cerebrospinal fluid antigen detection or positive cerebrospinal fluid culture or positive blood culture.

To confirm case:
Positive cerebrospinal fluid antigen detection or positive cerebrospinal fluid culture or positive blood culture.
**ACUTE FLACCID PARALYSIS (SUSPECTED POLIOMYELITIS)**

Acute flaccid paralysis (AFP) in a child aged <15 years, including Guillain–Barré syndrome or any paralytic illness in a person of any age.

Confirmed poliomyelitis case:
An AFP case with laboratory-confirmed wild poliovirus in stool sample.

**EBOLA AND MARBURG VIRAL HAEMORRHAGIC FEVERS (VHF)**

Suspected (clinical) case:
Any person ill or deceased who has or had a fever with acute clinical symptoms and signs of haemorrhage, such as bleeding of the gums, nose bleeds, conjunctival injection, red spots on the body, bloody stools and/or mealena (black liquid stools), or vomiting blood (haematemesis). Documented prior contact with a case of VHF is not required.

Probable case (with or without bleeding):
Any person (living or dead) having had contact with a clinical case of EHF and with a history of acute fever.

Or

Any person (living or dead) with a history of acute fever and three or more of the following symptoms: headache/vomiting/nausea/loss of appetite/diarrhoea/intense fatigue/abdominal pain/general muscular or articular pain/difficulty in swallowing/hiccoughs.

Or

Unexplained death:
The distinction between a suspected case and a probable case in practice is relatively unimportant as far as outbreak control is concerned.

Contact:
A person without any symptoms having had physical contact with a case or the body fluids of a case within the past 3 weeks. The notion of physical contact may be proven or highly suspected, such as having shared the same room/bed, cared for a patient, touched body fluids or closely participated in a burial (e.g. physical contact with a corpse).

To confirm case:
Laboratory confirmation of initial cases is necessary when an epidemic of VHF is suspected. Once the outbreak is confirmed, however, there is no need to collect specimens systematically from each patient, unless this can be done under perfectly safe conditions with appropriate laboratory support.

Confirmed diagnosis is based on ELISA for specific IgG and IgM antibodies, or Ebola-specific antigen detection. These tests are not commercially available and must be performed in specially equipped regional laboratories or shipped to WHO collaborating centres.
YELLOW FEVER

Suspected case:
Acute onset of fever followed by jaundice within 2 weeks of onset of first symptoms. Haemorrhagic manifestations and signs of renal failure may occur.

There are two disease phases for yellow fever.

Acute phase:
While some infections cause no symptoms whatsoever, this first phase is normally characterized by fever, muscle pain (with prominent backache), headache, shivers, loss of appetite, nausea and/or vomiting. Often, the high fever is paradoxically associated with a slow pulse (Faget's sign). Most patients improve after 3–4 days and their symptoms disappear, but 15% enter the toxic phase.

Toxic phase:
Fever reappears, the patient rapidly develops jaundice and complains of abdominal pain with vomiting. Bleeding can occur from the mouth, nose, eyes and/or stomach. Once this happens, blood appears in the vomit and faeces. Kidney function deteriorates; this can range from abnormal protein levels in the urine (albuminuria) to complete renal failure with no urine production (anuria). Half the patients in the “toxic phase” die within 10–14 days; the remainder recover without significant organ damage.

To confirm case:
Laboratory confirmation through:
— isolation of yellow fever virus, or
— presence of yellow fever specific IgM or a 4-fold or greater rise in serum IgG levels in paired sera (acute and convalescent), or
— positive post-mortem liver histopathology, or
— detection of yellow fever antigen in tissues by immunohistochemistry, or
— detection of yellow fever virus genomic sequences in blood or organs by PCR.
Or epidemiologically linked to a confirmed case or outbreak.

ACUTE LOWER RESPIRATORY TRACT INFECTION / PNEUMONIA IN CHILDREN AGED UNDER 5 YEARS

Cough or difficult breathing
and
Breathing 50 or more times per minute for infants aged 2 months to 1 year
Breathing 40 or more times per minute for children aged 1–5 years
and
No chest indrawing, no stridor, no general danger signs.

Note: Severe pneumonia = Cough or difficult breathing plus any general danger sign (unable to drink or breastfeed, vomits everything, convulsions, lethargic or unconscious) or chest indrawing or stridor in a calm child

MALARIA

Clinical case definition:

Uncomplicated malaria
Patient with fever or history of fever within the past 48 hours (with or without other symptoms such as nausea, vomiting and diarrhoea, headache, back pain, chills, myalgia) in whom other obvious causes of fever have been excluded.
Severe malaria
Patient with symptoms as for uncomplicated malaria, as well as drowsiness with extreme weakness and associated signs and symptoms related to organ failure such as disorientation, loss of consciousness, convulsions, severe anaemia, jaundice, haemoglobinuria, spontaneous bleeding, pulmonary oedema and shock.

Confirmed malaria case (uncomplicated or severe):
Patient with uncomplicated or severe malaria with laboratory confirmation of diagnosis by malaria blood film or other diagnostic test for malaria parasites.

To confirm case:
Demonstration of malaria parasites in blood film by examining thick or thin smears, or by rapid diagnostic test kit for *Plasmodium falciparum*.

**NEONATAL TETANUS**

Suspected case:
Any neonatal death between 3 and 28 days of age in which the cause of death is unknown or
Any neonate reported as having suffered from neonatal tetanus between 3 and 28 days of age but not investigated.

Confirmed case:
Any newborn with normal ability to suck and cry during the first 2 days of life but who, between 3 and 28 days of age, can no longer suck normally and becomes stiff or has convulsions (i.e. jerking of the muscles) or both.
Hospital-reported cases are considered as confirmed cases.

The diagnosis is entirely clinical and does not depend on bacteriological confirmation.

**SEXUALLY-TRANSMITTED INFECTIONS**

**Genital ulcer syndrome**
Ulcer on penis or scrotum in men and on labia, vagina or cervix in women with or without inguinal adenopathy.

**Urethral discharge syndrome**
Urethral discharge in men, with or without dysuria.

**Vaginal discharge syndrome**
Abnormal vaginal discharge (amount, colour and odour), with or without lower abdominal pain or specific symptoms or specific risk factors

**Lower abdominal pain**
Symptoms of lower abdominal pain and pain during sexual relations, with examination showing vaginal discharge, lower abdominal tenderness on palpation, or temperature >38 °C.

**TUBERCULOSIS (TB)**

Suspected TB case:
Any person who presents with symptoms or signs suggestive of pulmonary TB, in particular cough of long duration (>2 weeks).

May also be coughing blood, have chest pain, shortness of breath, fever/night sweats, tiredness, loss of appetite and significant weight loss.
All TB suspects should have three sputum samples examined by light microscopy. Early morning samples are more likely to contain the TB organism than a sample taken later in the day.

**Pulmonary TB smear-positive (PTB+)***
Diagnostic criteria should include:
- At least two sputum smear specimens positive for acid fast bacilli (AFB)
- One sputum smear specimen positive for AFB and radiographic abnormalities consistent with active pulmonary TB
- One sputum smear specimen positive for AFB and a culture positive for *Mycobacterium tuberculosis*.

**Pulmonary TB smear-negative (PTB–)**
A case of pulmonary TB that does not meet the above definition for smear-positive TB. Diagnostic criteria should include:
- At least three sputum smear specimens negative for AFB
- Radiographic abnormalities consistent with active pulmonary TB
- No response to a course of broad spectrum antibiotics
- Decision by a clinician to treat with a full course of anti-TB chemotherapy.

**FEVER OF UNKNOWN ORIGIN**
Person with fever (>38 °C axillary) in whom all obvious causes of fever have been excluded.

**OTHER COMMUNICABLE DISEASES**

**TYPHOID FEVER**
Person with fever of at least 38 °C for 3 or more days is considered suspect if the epidemiological context is conducive.

Clinical diagnosis is difficult as it may vary from a mild illness with low grade fever and malaise to a severe picture of sustained fever, diarrhoea or constipation, anorexia, severe headache and intestinal perforation.

**To confirm case:**
Isolation of *S. Typhi* from blood or stool cultures.

**SEVERE MALNUTRITION**
In children aged 6–59 months (65 cm to 110 cm in height):
- Weight-for-height (W/H) index <-3 Z-scores (on table of NCHS/WHO normalized reference values of weight-for-height by sex) or
- Bilateral pitting oedema irrespective of W/H, in absence of other causes.
**TRAUMA/ INJURY**

Any person who has sustained, either directly or indirectly, a fatal or non-fatal injury caused by:

- war-related: any weapons or explosion of a landmine or other unexploded ordnance (UXO).
- other: road traffic accidents, domestic violence, burns.

Note: Landmine injuries relate to buried mines (e.g. antipersonnel and/or antivehicle mines). UXO injuries arise from explosive objects/devices that are typically above ground at the time of detonation, such as cluster munitions that did not detonate on impact.

**MATERNAL DEATH**

Death of a woman while pregnant or within 42 days of termination of pregnancy, regardless of the site or duration of pregnancy, from any cause related to or aggravated by the pregnancy or its management.

**NEONATAL DEATH**

Death of liveborn infant during the first 28 days of life. It is a classification by age, not cause.
Democratic Republic of the Congo

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4. **Guidelines for outbreak control**
5. Case management of epidemic-prone diseases
6. **Guidelines for collection of specimens for laboratory testing**
7. Outbreak investigation kit
### TABLE 1. STEPS IN MANAGEMENT OF AN OUTBREAK

<table>
<thead>
<tr>
<th>1. PREPARATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health coordination meetings</td>
</tr>
<tr>
<td>Surveillance system: weekly epidemic-prone disease reports to MOHS and WHO</td>
</tr>
<tr>
<td>Stockpiles: sampling kits, appropriate antibiotics, intravenous fluids</td>
</tr>
<tr>
<td>Contingency plans for isolation wards in hospitals</td>
</tr>
<tr>
<td>Laboratory support</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. DETECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diseases of outbreak potential are marked with an asterisk (*) on the Weekly morbidity form. They must be reported as soon as possible to your district medical officer (DMO) or district surveillance officer or health coordinator using the Outbreak alert form if the weekly alert thresholds provided in “Guidelines for use of surveillance forms” are passed. The health coordinator should inform the Ministry of Health and WHO.</td>
</tr>
<tr>
<td>A clinical specimen (e.g. stool, serum, cerebrospinal fluid) must be taken for laboratory confirmation. Include the case in the weekly health report.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Confirmation</strong></td>
</tr>
<tr>
<td>The lead health agency will investigate reported cases to confirm the outbreak situation. Clinical specimens will be sent for testing.</td>
</tr>
<tr>
<td>The lead health agency will set up 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.</td>
</tr>
</tbody>
</table>

| **Investigation**             |
| Collect/analyse descriptive data to date (e.g. age, date of onset, location of cases). |
| Develop hypothesis for pathogen/source/transmission. |
| Develop outbreak case definition. |
| Follow up cases and contacts. |
| Conduct further investigation/epidemiological studies. |

| **Control**                   |
| Implement control measures specific for the disease. |
| Treat cases with recommended treatment as in WHO guidelines. |
| Prevent exposure (e.g. isolation of cases in cholera outbreak). |
| Prevent infection (e.g. immunization in measles outbreak). |

<table>
<thead>
<tr>
<th>4. EVALUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess timeliness of outbreak detection and response.</td>
</tr>
<tr>
<td>Change public health policy if indicated (e.g. preparedness).</td>
</tr>
<tr>
<td>Write and disseminate outbreak report.</td>
</tr>
<tr>
<td>Resource Category</td>
</tr>
<tr>
<td>-----------------------------------------</td>
</tr>
<tr>
<td>Personnel</td>
</tr>
<tr>
<td>Supplies</td>
</tr>
<tr>
<td>Treatment facilities</td>
</tr>
<tr>
<td>Laboratory facilities</td>
</tr>
<tr>
<td>Transport</td>
</tr>
<tr>
<td>Communication links</td>
</tr>
<tr>
<td>Computers</td>
</tr>
</tbody>
</table>

In an outbreak requiring an immunization campaign:
- Safe injection equipment (e.g. auto-disable 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

<table>
<thead>
<tr>
<th>Disease Category</th>
<th>Risk Factors</th>
</tr>
</thead>
</table>
| Acute respiratory infections | Inadequate shelter with poor ventilation  
Indoor cooking, poor health-care services  
Malnutrition, overcrowding  
Age group under 1 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                  | Movement of people from endemic into malaria-free zones or from areas of low endemicity to hyperendemic areas.  
Increased population density promoting mosquito bites.  
Interruption of vector control measures  
Inadequate health-care services  
Stagnant water  
Flooding, changes in weather patterns |
| Measles                  | Measles immunization coverage rates below 80%  
Population movement  
Overcrowding |
| Meningococcal meningitis | Meningitis belt  
Dry season  
Dust storms  
Overcrowding  
High rates of acute respiratory infections |
| Viral haemorrhagic fever (VHF) | Lack of hygiene, poor sanitation, contact with objects/food contaminated with rodent excreta; unsafe food handling and storage practices  
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 chimpanzees (Ebola) |
| Yellow Fever             | Unvaccinated people moving to areas of endemicity are at risk  
Overcrowding  
Open water storage provides favorable habitat for *Aedes aegypti*  
Old tyres, old water containers increase vector breeding  
Poor drainage (leading to pools and open channels of water) may increase vector breeding opportunities. |
FIGURE 1:

Organization of an Emergency Treatment Centre and Patient-Flow

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 4. ESSENTIAL HYGIENE RULES IN A CHOLERA TREATMENT CENTRE

<table>
<thead>
<tr>
<th>Mode of transmission</th>
<th>Essential rules in the unit</th>
<th>Additional recommended rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>People</td>
<td>Access limited to patient + one family member + staff</td>
<td>Ideally one carer per patient only</td>
</tr>
<tr>
<td></td>
<td>One way flow of people</td>
<td>3 separate spaces within Unit (see Figure 1)</td>
</tr>
<tr>
<td>Water</td>
<td>Safe water (chlorination concentration according to specific use; see Table 5)</td>
<td>Ideally 50 litres per patient and per day</td>
</tr>
<tr>
<td></td>
<td>Large quantity needed (minimum 10 litres/person/day)</td>
<td></td>
</tr>
<tr>
<td>Hands</td>
<td>Hand-washing stations with safe water and soap in sufficient quantities</td>
<td>Cut and clean nails</td>
</tr>
<tr>
<td></td>
<td>Wash hands with water and soap before and after taking care of patients</td>
<td></td>
</tr>
<tr>
<td></td>
<td>after using the latrines</td>
<td></td>
</tr>
<tr>
<td></td>
<td>before cooking or eating</td>
<td></td>
</tr>
<tr>
<td></td>
<td>after leaving the admission ward</td>
<td></td>
</tr>
<tr>
<td>Food</td>
<td>Cooked food</td>
<td>Food provided by the unit (preferably not by families)</td>
</tr>
<tr>
<td></td>
<td>Health-care workers should not handle food or water</td>
<td>Large stocks of food may be &quot;tempting&quot; and may lead to security problems</td>
</tr>
<tr>
<td>Clothes</td>
<td>Wash clothes and linen with the appropriate chlorine solution</td>
<td>If no chlorine available, wash clothes with soap and dry them in the sun</td>
</tr>
<tr>
<td>Environmental contamination (faeces and waste)</td>
<td>Ensure exclusive latrines for the unit</td>
<td>Latrines at least 100 metres away from wells or surface sources</td>
</tr>
<tr>
<td></td>
<td>Disinfect buckets, soiled surfaces and latrines regularly with the appropriate chlorine solution (see Table 5)</td>
<td>Special cholera beds</td>
</tr>
<tr>
<td></td>
<td>Incinerator for medical waste</td>
<td></td>
</tr>
<tr>
<td>Corpses</td>
<td>Separate morgue</td>
<td>Find ways to have safe funeral practices</td>
</tr>
<tr>
<td></td>
<td>Disinfect corpses (see Table 5)</td>
<td>Bury corpses as soon as possible</td>
</tr>
</tbody>
</table>

*Developed by the WHO Global Task Force on Cholera Control*
## TABLE 5. PREPARATION AND USE OF DISINFECTANTS

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

*Developed by the WHO Global Task Force on Cholera Control*

Approximate measurements used:
1 teaspoon = 5 ml
1 tablespoon = 15 ml

Do not use a metallic bucket for the 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 are 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.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>Population (+ numbers expected to fall ill)</th>
<th>Your area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5000</td>
<td>10000</td>
</tr>
<tr>
<td></td>
<td>(10)</td>
<td>(20)</td>
</tr>
<tr>
<td><strong>Rehydration supplies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ORS packets (for 1 litre each)</td>
<td>65</td>
<td>130</td>
</tr>
<tr>
<td>Nasogastric tubes (adults) 5.3/3.5 mm (16 Flack) 50 cm</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Nasogastric tubes (children)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Ringer’s lactate bags, 1 litre, with giving sets</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>Scalp vein sets</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>Antibiotics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doxycycline, 100 mg (adults)</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Erythromycin 250 mg (children)</td>
<td>24</td>
<td>48</td>
</tr>
<tr>
<td><strong>Other treatment supplies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large water dispensers with tap (marked at 5–10 litres)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1 litre bottles for ORS solution</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>0.5 litre bottles for ORS solution</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Tumblers, 200 ml</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Teaspoons</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Cotton wool, kg</td>
<td>1/2</td>
<td>1</td>
</tr>
<tr>
<td>Adhesive tape, reels</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

*Developed by the WHO Global Task Force on Cholera Control.*
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 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.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>Population (+ numbers expected to fall ill)</th>
<th>Your area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5000</td>
<td>10000</td>
</tr>
<tr>
<td></td>
<td>(10)</td>
<td>(20)</td>
</tr>
<tr>
<td>Rehydration supplies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ORS packets (for 1 litre each)</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Ringer’s lactate bags, 1 litre, with giving sets</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Scalp vein sets</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Antibiotics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ciprofloxacin, 500mg</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td>Other treatment supplies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large water dispensers with tap (marked at 5–10 litres)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1 litre bottles for ORS solution</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>0.5 litre bottles for ORS solution</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Tumblers, 200 ml</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Teaspoons</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Cotton wool, kg</td>
<td>1/2</td>
<td>1</td>
</tr>
<tr>
<td>Adhesive tape, reels</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Hand soap, kg</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Boxes of soap for washing clothes</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>1-litre bottle of cleaning solution (2% chlorine or 1–2% phenol)</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Developed by the WHO Global Task Force on Cholera Control.
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.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>Population (+ numbers expected to fall ill)</th>
<th>Your area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>5 000</td>
<td>10 000</td>
</tr>
<tr>
<td>(10)</td>
<td>(20)</td>
<td>(30)</td>
</tr>
</tbody>
</table>

Rehydration supplies

| ORS packets (for 1 litre each) | 10 | 20 | 30 | 40 | 100 | 200 |
| Ringer’s lactate bags<sup>a</sup> 1 litre, with giving sets | 1 | 2 | 3 | 4 | 10 | 20 |
| Scalp vein sets | 1 | 1 | 1 | 2 | 2 | 5 | 10 |

Antibiotics

| Antibiotic | Population (+ numbers expected to fall ill) | Your area |
| Chloramphenicol, 250 mg | 2 500 | 5 000 | 7 500 | 10 000 | 25 000 | 50 000 |
| Amoxicillin, 500 mg | 1 680 | 3 360 | 5 040 | 6 720 | 16 800 | 33 600 |
| Co-trimoxazole, (SMX 400 mg + TMP 80 mg) | 840 | 1 680 | 2 520 | 3 360 | 8 400 | 16 800 |
| Cefixime, 200 mg<sup>b</sup> | 840 | 1 680 | 2 520 | 3 360 | 8 400 | 16 800 |

Other treatment supplies

| Item | Population (+ numbers expected to fall ill) | Your area |
| 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 | 1 | 2 | 2 | 5 | 10 |
| Cotton wool, kg | ½ | 1 | 1½ | 2 | 5 | 10 |
| Adhesive tape, reels | 1 | 1 | 1 | 2 | 3 | 6 |
| Hand soap, kg | 2 | 4 | 6 | 8 | 20 | 40 |
| Box 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 |

<sup>a</sup> Less than 50% of patients need IV rehydration.
<sup>b</sup> In case of multidrug resistance to above antibiotics, choose cefixime.

Developed by the WHO Global Task Force on Cholera Control.
FIGURE 2: VIRAL HAEMORRHAGIC FEVER OUTBREAK CONTROL

Identify suspected cases of viral haemorrhagic fever (VHF)

Severe illness with weakness and fatigue.
Fever (38.5 °C or 101 °F) for more than 72 hours and less than 2 weeks.

Diagnose and treat for likely cause of fever in area (such as malaria, typhoid fever, dysentery, severe bacterial infection).

If no response to antimalarial and antibiotic treatment.

Evaluate signs and symptoms and define if they correspond to any of the VHF case definitions.
(See Case definitions section from Toolkit).
Review the patient’s history for any contact with someone who died from unexplained illness (e.g. with fever and bleeding).

Suspect VHF
Begin VHF isolation precautions.

Note: The above flowchart applies to the first steps for VHF outbreak investigation.
Health workers should be aware of the possibility for suspecting a VHF in a non-outbreak situation. As soon as a VHF is suspected, VHF isolation precautions should begin. This will help to reduce the number of people exposed to the VHF.

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 healthcare worker suspects a VHF, he or she should notify the health facility administrator and the VHF coordinator who will:
  - refer the patient to the isolation area and take the necessary steps to begin VHF isolation precautions 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 a VHF is suspected and 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, vomit). 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:
These can be started even 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. Reinforce 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 Annex 7: Guidelines for collection of specimens for laboratory testing).

See Appendix 1: 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) the following questions:
- Place where is currently living.
- Other persons with the same symptoms in the family or village.
- Which place the patient has visited in the past 3 weeks.
- Use the answers to identify contacts.
- Provide them with information about VHF and when to seek care.
Specimens samples for laboratory confirmation:

Obtain specimen samples according to the suspected VHF for confirmation of diagnosis (See Annex 7: 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 transport/shipping of the sample to a WHO-recommended reference laboratory and 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 begin using VHF isolation precautions, especially:

- doctors or nurses providing direct patient care;
- cleaning, laundry, and waste disposal staff who clean and disinfect contaminated material and supplies;
- laboratory staff who handles samples from the suspected VHF cases;
- medical or support staff who prepares or handle deceased VHF patients.

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. Emphasize and ensure use VHF Isolation precautions whenever they have contact with the VHF patient, the patient’s blood or other body fluids, or contaminated supplies and equipment.
APPENDIX 1. 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 with 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 isolation area and restrict access to the isolation area. 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 area 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 or dispose of them safely.
FIGURE 3: EXAMPLE OF A VIRAL HAEMORRHAGIC FEVER TREATMENT ISOLATION AREA

ISOLATION AREA EXAMPLE

A sample layout for several viral haemorrhagic fever patients.
APPENDIX 2. USE SAFE BURIAL 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 burial practices involve touching and washing the body.

Prepare the body safely

Burial should take place as soon as possible after the body is prepared in the health facility.

Health facility staff should:

- Prepare the body safely;
- be aware of the family’s cultural practices and religious beliefs. Help the family understand why some practices cannot be done 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.¹
3. Place the body in a body bag (mortuary sack) and close it securely. Spray the body bag with a 0.5% chlorine solution.¹
4. If body bags are not available, wrap the body in two thickness of cotton cloth soaked with a 0.5% chlorine solution.¹ 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 member of the health facility staff to accompany the body to ensure that the safety precautions remain secure during the journey.

Prepare burial site

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

Disinfect the vehicle after transporting the body

- The staff person who disinfects the vehicle must wear protective clothing.
- Rinse the interior of the vehicle where the body was carried with a 0.5% chlorine solution¹ and let it soak for 10 minutes.
- Rinse well with clean water and let the vehicle air-dry.

¹ See Annex 7: Guidelines for collection of specimens for laboratory testing in this Toolkit.
COMMUNICABLE DISEASE TOOLKIT

ANNEX

Democratic Republic of the Congo

1. Health surveillance forms
2. Surveillance system guidelines and alert thresholds
3. Case definitions
4. Guidelines for outbreak control
5. Case management of epidemic-prone diseases
6. Guidelines for collection of specimens for laboratory testing
7. Outbreak investigation kit
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2. CHOLERA.........................................................................................................5
3. TYPHOID FEVER............................................................................................8
4. MEASLES .......................................................................................................10
5. MENINGITIS..................................................................................................13
6. YELLOW FEVER ...........................................................................................16
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APPENDIX 1: ASSESSMENT AND TREATMENT OF DIARRHOEA ...............21
1. BACILLARY DYSENTERY (SHIGELLOSIS)

Basic facts

- Bacillary dysentery is an acute bacterial disease involving the large and small intestines.
- It is the most important cause of acute bloody diarrhoea.
- Two-thirds of cases and most deaths occur in children aged under 10 years.
- Of the four *Shigella* serogroups (*S. dysenteriae*, *S. flexneri*, *S. sonnei* and *S. boydii*), *S. dysenteriae* type 1 (Sd1) causes the most severe disease and is the only cause of large-scale epidemics.

*Shigella dysenteriae* type 1:

- Most severe in young children, the elderly and malnourished.
- Displaced populations are at high risk in situations of overcrowding and poor sanitation/water.
- Transmission is by faecal–oral route from person to person and through contaminated food and water.
- Highly contagious: as few as 10–100 bacteria have caused disease in volunteers.
- Treatment is with antimicrobials, which reduce severity and duration of illness.
- Not usually associated with marked loss of fluid and electrolytes.
- Without prompt effective treatment, case-fatality rate can be as high as 10%.
- As infectious dose is low, shigellosis is associated with high secondary attack rates.

Clinical features

- Causes bloody diarrhoea often associated with fever, abdominal cramps and rectal pain.
- Incubation period usually 1–3 days, but may be up to 1 week.
- Complications include sepsis, rectal prolapse, haemolytic uraemic syndrome, seizures.
- Diagnosis is by observing blood in a fresh stool specimen or asking the patient or mother of a child whether the stools are bloody.

Diagnosis

- Within 4 days of onset of illness, collect specimens from case with current bloody diarrhoea who has not received antimicrobials for this illness.
- Fresh stools in sterile container to be kept at temperature 4 °C; samples must reach laboratory within 12 hours of being collected. If fresh stool samples are not refrigerated they must reach the laboratory for culture sooner.
- Where transport to the laboratory will take longer, Cary-Blair transport media must be used.
- Transport container should be well insulated and should contain freezer packs or wet ice.
- Transport must not take more than 3 days.

Case management

**Clinical case definition:** Acute bloody diarrhoea

**Laboratory criteria:** Isolation of *Shigella dysenteriae* types 1 (Sd1) from stool samples.

**Table 1. High-risk patients**

<table>
<thead>
<tr>
<th>Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children aged &lt;5 years, but especially infants, severely malnourished children and children who have had measles in the past 6 weeks</td>
</tr>
<tr>
<td>Older children and adults who are obviously malnourished</td>
</tr>
<tr>
<td>A patient who is severely dehydrated, has had a convulsion, or is seriously ill when first seen</td>
</tr>
<tr>
<td>Adults aged &gt;50 years</td>
</tr>
</tbody>
</table>
Standard treatment regimens:

A. Rehydrate with ORS or IV solution depending on the severity, and monitor the hydration status frequently. (See Appendix 1 for assessment and treatment of diarrhoea and dehydration.)

- Refer seriously ill or severely malnourished patients to hospital immediately.

B. Give antibiotics

- Antibiotics are essential and should be selected on the basis of susceptibility testing of the organisms grown from patients affected by the disease. The drug must be effective against the local Sd1 strains.
- If an antimicrobial is effective, clinical improvement should be noted within 48 hours. If there is no improvement, treat with second-line drug for 5 days if available; otherwise, continue full 5-day course of first-line drug. Use only one of the following antibiotics:

<table>
<thead>
<tr>
<th>Antibiotics</th>
<th>Doses</th>
<th>Children</th>
<th>Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Under 1 year</td>
<td>1–5 years</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>30 mg/kg divided 2 times/day</td>
<td>$\frac{1}{4}$ tablet 2 times/day 3 days</td>
<td>$\frac{1}{2}$ tablet 2 times/day 3 days</td>
</tr>
<tr>
<td>500 mg</td>
<td>2 times/day 3 days</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Do not give antimicrobials known to be ineffective. When the supply of an effective antimicrobial is limited, priority should be given to high-risk patients (see Table 1).

Do not forget:

In health facilities
- Strengthen sanitary and hygiene measures in general
- Implement disinfection measures in wards.

In affected areas
- Ensure access to safe water (quality and quantity)
- Strengthen health education on hygiene and disinfection measures
- Set up surveillance for early detection of cases and monitoring of the outbreak.

See Annex 5: Guidelines for outbreak control in this Toolkit for organization of an emergency treatment centre (Figure 1), essential hygiene rules in a treatment centre (Table 4), preparation and use of disinfectants (Table 5) and calculation of treatment supply needs for dysentery (Table 7).

_This section was developed by the WHO Global Task Force on Cholera Control._
2. CHOLERA

Basic facts

- Cholera is an acute bacterial enteric disease with profuse watery stool.
- It is caused by a Gram-negative bacillus *Vibrio cholera*, which produces a powerful enterotoxin that causes copious secretory diarrhoea.
- Transmission is by the faecal–oral route. Infection results from ingestion of organisms in food and water, or from indirect person-to-person contamination (unwashed hands).
- Acute carriers, including those with asymptomatic or mild disease, are important in the maintenance and transmission of cholera.
- Cholera is asymptomatic in more than 90% of infected cases.
- Attack rates in displaced populations can be as high as 10–15%; in normal situations, it is estimated at 1–2%.
- Case-fatality rates are usually around 5% but have reached 40% in large outbreaks in refugee camps.
- With appropriate treatment (with ORS in most cases), CFR can be reduced to 1%.

Clinical features

- Incubation period is 1–5 days.
- Onset of symptoms is abrupt, with copious watery diarrhoea, classic "rice-water" stool with or without vomiting.
- Fluid loss can lead to rapid and profound dehydration, low serum potassium and acidosis.
- Fever is unusual, except in children.
- Vomiting without associated nausea may develop, usually after the onset of diarrhoea.
- Severe dehydration leads to loss of skin turgor, malaise, tachypnoea and hypotension.

Early detection of cholera cases is important to ensure prompt treatment and reduction of environmental contamination. Cholera should be suspected when:

- a patient aged over 5 years develops severe dehydration from acute watery diarrhoea (usually with vomiting), or
- any patient aged over 2 years has acute watery diarrhoea in an area where there is an outbreak of cholera.

Diagnosis

- Fresh stools in sterile container if transport time is less than 2 hours.
- In alkaline peptone water if transport time is less than 24 hours.
- Cary-Blair transport media.
- Media previously cooled for 1 hour.
- Transport container well insulated.
- Transport possible for 7–14 days after collection.

Case management

**Clinical case definition:** acute watery diarrhoea with or without vomiting, with or without severe dehydration, once cholera has been already confirmed.

**Laboratory criteria:** isolation of *Vibrio cholerae* O1 or O139 from stools.
Prevention and treatment of dehydration are the mainstays in the management of cholera:

**STEP 1** Assess for dehydration (see Appendix 1)
**STEP 2** Rehydrate and monitor frequently
**STEP 3** Maintain hydration: replace ongoing fluid losses until diarrhoea stops
**STEP 4** Give oral antibiotics to patients with severe dehydration
**STEP 5** Feed the patient:
  - ensure normal intake of food as soon as possible
  - breastfeeding for infants and young children should continue.

### Standard treatment regimens:

**A. Rehydrate with ORS or IV solution depending on the severity, and monitor the hydration status frequently (see Appendix 1 for assessment and treatment of diarrhoea and dehydration.)**

For severe dehydration, give IV fluid immediately to replace fluid deficit. Use Ringer’s lactate solution or Hartmann’s solution or, if not available, normal saline solution. Plain glucose solutions are ineffective and should not be used.

**B. Give antibiotics for severe cholera cases only**

<table>
<thead>
<tr>
<th>Antibiotics</th>
<th>Dose</th>
<th>Under 1 year</th>
<th>1–5 years</th>
<th>5-15 years</th>
<th>Adults</th>
<th>Pregnant women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erythromycin</td>
<td>250 mg</td>
<td>¼ tablet</td>
<td>½ tablet</td>
<td>1 tablet</td>
<td>2 tablets</td>
<td>2 tablets</td>
</tr>
<tr>
<td></td>
<td>30 mg/kg</td>
<td>4 times/day</td>
<td>4 times/day</td>
<td>4 times/day</td>
<td>4 times/day</td>
<td>4 times/day</td>
</tr>
<tr>
<td></td>
<td>3 days</td>
<td>3 days</td>
<td>3 days</td>
<td>3 days</td>
<td>3 days</td>
<td>3 days</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>300 mg</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3 tablets</td>
</tr>
<tr>
<td></td>
<td>single dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Antibiotic therapy is not essential** to the management of cholera. **Effective rehydration therapy is life-saving.** In emergencies, systematic administration of antimicrobials is justified only for severe cases and in situations where bed occupancy, patient turnover or stocks of intravenous fluids are expected to reach critical levels in respect of case management capacity.
- An antibiotic sensitivity profile of the outbreak strain must be available as soon as possible to decide on the possible choice of antibiotic. Oral antimicrobials only must be given, and only after the patient has been rehydrated (usually in 4–6 hours) and vomiting has stopped.

**Do not forget:**

In health facilities
- Strengthen sanitary and hygiene measures in general implementation of disinfection measures in cholera wards
- Implement special funeral practices
- Disinfect corpses with chlorine solution (2%).
- Fill mouth and anus with cotton wool soaked with 2% chlorine solution.
- Wash hands with soap after touching the corpse.
- Disinfect the clothing and bedding of the deceased by stirring them in boiling water or by drying them thoroughly in the sun.

In affected areas
- Ensure access to safe water (quality and quantity)
- Strengthen health education on hygiene, disinfection measures and food safety
• Set up surveillance for early detection of cholera cases and monitoring of the outbreak.

Chemoprophylaxis and quarantine measures are not effective to contain the spread of cholera.

See Annex 5: *Guidelines for outbreak control* in this Toolkit for organization of an emergency treatment centre (Figure 1), essential hygiene rules in a cholera treatment centre (Table 4), preparation and use of disinfectants (Table 5) and calculation of treatment supply needs for cholera (Table 6).

*This section was developed by the WHO Global Task Force on Cholera Control.*
3. TYPHOID FEVER

Basic facts

- Typhoid fever is a serious systemic infection caused by the enteric bacillus *Salmonella typhi* serovar *typhi* (*S. Typhi*).
- Transmission is via the faecal–oral route, mainly from ingestion of organisms in food and water contaminated by faeces and urine of patients and carriers, or indirectly from person to person (unwashed hands).
- 2–5% of infected cases remain carriers for several months, and are highly involved in the spread of the disease.
- Case-fatality rate is high (10–20%) in the absence of a proper treatment.
- With appropriate antibiotic therapy, CFR can be reduced to 1%.
- Relapses occur in 3–4% of cases.
- Some strains of *S. Typhi* are resistant to antibiotics.
- Mass immunization may be a valuable adjunct for the control of typhoid fever during a sustained, high-incidence epidemic.
- A parenteral vaccine containing the polysaccharide *Vi* antigen is the vaccine of choice for displaced populations; effective protection is afforded by a single injection, and adverse reactions are minimal.

Clinical features

- Incubation period is usually 8–14 days, but may be from 3 days to as much as 1 month.
- Mild or inapparent forms are common, especially in endemic areas, and present with low-grade fever and malaise.
- Severe symptoms begin with the sudden onset of sustained fever, severe headache, nausea and loss of appetite, sometimes accompanied by hoarse cough and constipation or diarrhoea.
- Complications of intestinal ulceration can include intestinal perforation or haemorrhage.

Diagnosis

- Isolation of *S. Typhi* from blood culture early after disease onset or from stool culture after the first week.
- Because of limited specificity and sensitivity, serological tests are generally of little diagnostic value.

Case management

**Clinical case definition:** acute or insidious onset of sustained fever, headache, malaise, anorexia, relative bradycardia, constipation or diarrhoea and non-productive cough. (However, many mild and atypical infections occur.)

*Laboratory criteria:* isolation of relevant serovars of *S. Typhi* from stool or blood of patient.

**Standard treatment regimens:**

A. Rehydrate with ORS or IV solution depending on severity

B. Give antibiotics

Antibiotics are essential and should be decided on the basis of susceptibility testing of the organisms grown from patients affected by the disease. Use only one of the following antibiotics:
## Effective drugs

<table>
<thead>
<tr>
<th>Susceptibility</th>
<th>Antibiotic</th>
<th>Daily dose</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fully sensitive</td>
<td>Chloramphenicol</td>
<td>50–75 mg</td>
<td>14–21</td>
</tr>
<tr>
<td></td>
<td>Amoxicillin</td>
<td>75 00 mg</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Co-trimoxazole</td>
<td>8–40 mg</td>
<td>14</td>
</tr>
<tr>
<td>Multidrug-resistant</td>
<td>Cefixime</td>
<td>15–20 mg</td>
<td>7–14</td>
</tr>
<tr>
<td></td>
<td>Azithromycin</td>
<td>8–10 mg</td>
<td>7</td>
</tr>
</tbody>
</table>

### Treatment of complications

Therapy for complications may include rest, diuretics, ionotropes, and anti-arhythmic drugs for myocarditis, replacement blood components for bone marrow suppression and blood transfusion for haemorrhagic problems.

Surgery is necessary in case of intestinal perforation.

### Vaccination

Vaccination against typhoid fever during an outbreak should be considered: please contact the WHO Global Task force on Cholera Control (e-mail: cholera@who.int).

### Do not forget:

In health facilities
- Strengthen sanitary and hygiene measures in general
- Implement disinfection measures in wards
- Implement special funeral practices.

In affected areas
- Ensure access to safe water (quality and quantity)
  - Strengthen health education on hygiene and disinfection measures
  - Set up surveillance for early detection of cases and monitoring of the outbreak.

See Annex 5: *Guidelines for outbreak control* in this Toolkit for organization of an emergency treatment centre (Figure 1), essential hygiene rules in a treatment centre (Table 4), preparation and use of disinfectants (Table 5) and calculation of treatment supply needs for typhoid (Table 8).

*This section was developed by the WHO Global Task Force on Cholera Control.*
4. MEASLES

Basic facts

- Measles is a highly communicable viral infection transmitted through airborne spread of respiratory droplets from person to person, or by direct contact with nasal and throat secretions of infected persons or via objects that have been in close contact with an infected person.
- It is a severe disease caused by the rubeola virus, which damages epithelial surfaces and the immune system.
- Measles can increase susceptibility to other infections such as pneumococcus and Gram-negative bacteria.
- It can lead to or exacerbate vitamin A deficiency, increasing susceptibility to xerophthalmia, blindness and premature death.
- The most vulnerable age groups are children aged between 9 months and 5 years in developing countries, but this depends on the immunisation coverage rates.
- Deaths are mostly the result of complications such as pneumonia, croup and diarrhoea and are frequently associated with malnutrition.

Note: While this section details the diagnosis and case management of measles, immunization remains the most important strategy for measles control. Measles immunization campaigns are one of the highest priorities in displaced populations. The recommended age group is from 6 months to 15 years, with vitamin A supplementation in children aged 6–59 months. Those vaccinated between 6 and 9 months must have another dose at 9 months of age.

Clinical features

- Incubation period is usually 10 days from exposure to onset of fever.
- Initial symptoms and signs are high fever, runny nose, coryza, cough, red eyes and Koplik spots (small white spots on the buccal mucosa).
- Characteristic erythematous (red) maculopapular (blotchy) rash appears on the third to seventh day, starting behind the ears and on the hairline and then spreading to the rest of the body.
- Temperature subsides after 3–4 days and the rash fades after 5–6 days.
- Measles is highly infectious from the start of the prodromal period until approximately 4–5 days after the rash appears.
- Case-fatality rates are estimated to be 3–5% in developing countries but rates may reach as much as 10–30% in displaced populations.

Complications

- Complications develop in 5–10% of cases.
- Complications occurring in the first week of illness, such as croup, diarrhoea and pneumonia, are usually due to effects of the measles virus and are rarely life-threatening.
- Later complications are usually a result of secondary viral or bacterial infections – post-measles pneumonia, diarrhoea and croup are the most common life-threatening complications.
- Pneumonia: usually severe, Gram-negative or staphylococcus.
- Diarrhoea: either due to virus or from a secondary infection, e.g. \textit{Shigella}.
- Malnutrition: precipitated by anorexia, stomatitis, fever, vomiting, diarrhoea and other complications.
- Stomatitis: comprises feeding (sucking and eating).
- Vitamin A deficiency: keratoconjunctivitis. Measles increases the need for vitamin A and often precipitates xerophthalmia.
- Encephalitis: caused by the measles virus itself, occurs on about the 5th day of the rash.
- Otitis media, croup.
- Blindness due to scarring, as a result of vitamin A deficiency and/or conjunctivitis.
Case management

— Take a history from the mother and examine the child for the following:

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to take feeds of fluids</td>
<td>Nutritional status</td>
</tr>
<tr>
<td>Cough and difficult breathing</td>
<td>Breathing rate, chest indrawing, stridor</td>
</tr>
<tr>
<td>Diarrhoea or blood in stools</td>
<td>Dehydration and fever</td>
</tr>
<tr>
<td>Sore mouth, eyes or ears</td>
<td>Mouth ulcers, sore and discharging ears and eyes, white spots on eyes, Level of consciousness</td>
</tr>
</tbody>
</table>

Case management of uncomplicated measles – health centre

Most children will have uncomplicated measles and require supportive care as outpatients. Good supportive care can improve a child’s outcome. Isolation of patients with measles is not indicated in emergency situations. All children with measles in these settings should have their nutritional status monitored and be enrolled in a feeding programme if necessary.

Nurse the child in a shaded and well ventilated area, which is generally more comfortable for the child; sunlight can be painful on their eyes and a cool environment can keep their temperature down.

- Control the fever by tepid sponging and paracetamol.
- Keep well hydrated: treat diarrhoea with ORS.
- Observe closely for complications.
- Give prophylaxis against xeropthalmia: vitamin A on day 1 and day 2.

<table>
<thead>
<tr>
<th></th>
<th>Day 1</th>
<th>Day 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants &lt;6 months</td>
<td>50 000 IU</td>
<td>50 000 IU</td>
</tr>
<tr>
<td>Infants 6–11 months</td>
<td>100 000 IU</td>
<td>100 000 IU</td>
</tr>
<tr>
<td>Children &gt;11 months</td>
<td>200 000 IU</td>
<td>200 000 IU</td>
</tr>
</tbody>
</table>

- Maintain adequate protein-calorie intake: tell mothers to give frequent small meals.
- Continue breastfeeding.
- Provide supplementary feeding, if available. The diet must be soft, with a high calorie density, so small portions go a long way. Unless in the form of egg, protein is unlikely to be eaten – remember the child has a sore mouth and poor appetite.
- Do not admit children with measles to general feeding centres until after the infectious period.
- If there are high numbers of cases, it may be necessary to set up a small unit for children with measles, as they and their mothers need considerable supportive care.
- Use antimicrobials only when indicated.
- There should be active case-finding during an epidemic, if practical (home visits).

Case management of complicated measles – hospital

- Control fever, provide nutritional support and vitamin A therapy as for uncomplicated measles.
- Antimicrobials should be given only if there is a specific indication such as pneumonia, otitis media or dysentery.
- Prophylactic antimicrobials should be given to children at significant risk of secondary bacterial infection – such as children with severe malnutrition, HIV infection or xeropthalmia. A broad-spectrum antibiotic such as ampicillin or co-trimoxazole should be used.
- Pneumonia: cough and rapid breathing (40 breaths/minute or more if aged over 1 year; 50 breaths/minute if aged less than 1 year): give an antibiotic such as ampicillin or amoxycillin or co-trimoxazole. If the child’s condition does not improve after 24–48 hours, change the antibiotic to an antistaphylococcal drug such as cloxacillin or chloramphenicol.
- Diarrhoea: three or more loose or watery stools in 24 hours. Assess if there is associated dehydration. If there is blood in the stool, the child has dysentery. The commonest cause of dysentery is *Shigella* (see Bacillary dysentery (shigellosis) for case management).
- Eye problems: the major eye problems in measles are conjunctivitis or keratitis, and corneal damage due to vitamin A deficiency. Red and watery eyes are the results of conjunctivitis (inflammation of the conjunctiva): no treatment is necessary.
- Sticky eyes or pus in the eyes are caused by a secondary bacterial infection: clean the eyes at least three times a day with cooled boiled water, using cotton wool or a clean cloth. Use tetracycline ointment three times a day for 7 days. NEVER use steroid eye ointments. Ensure that vitamin A has been given. If there is vitamin A eye disease, a third dose must be given 4 weeks later.
5. MENINGITIS

Basic facts

- An acute inflammation of the meninges that can be caused by bacteria or viruses.
- Transmission is through direct contact with respiratory droplets.
- Large outbreaks of meningitis are mainly due to meningococcus (*Neisseria meningitidis* serogroups A, C and W).
- *N. meningitidis* also causes meningococcal septicaemia – a less common but severe, highly fatal disease with acute fever, purpura and shock.
- *N. meningitidis*, *Streptococcus pneumonia* and *Haemophilus influenza* account for 80% of all cases of bacterial meningitis.
- Viral meningitis is rarely serious and may be caused by a number of viruses such as Coxsachie virus or Enterovirus.
- Displaced populations and displaced persons are at increased risk of meningitis because of overcrowding, poor hygiene and poor access to health care.
- Epidemics in refugee camps have mainly been due to *N. meningitides*, serogroup A.
- 80% of cases of meningococcal meningitis occur in those aged under 30 years.
- Without appropriate treatment, the case fatality rate in meningococcal meningitis can be as high as 50%; with correct treatment, this can be reduced to 5–15%.
- Vaccines are available against meningococcus serogroups A, C, Y and W135, which are very effective in controlling epidemics. When used in rapid mass campaigns, vaccination can contain an outbreak within 2–3 weeks. For individuals aged over 2 years, the vaccine efficacy rate is 90% one week after injection.

Diagnosis

- Ask about: sudden onset of intense headache, fever, nausea, vomiting, photophobia, stiff neck.
- Examine for:
  - meningeal rigidity, i.e. neck stiffness
  - lethargy, delirium, coma
  - purpura – characteristic sign of meningococcal septicaemia
  - symptoms of shock – low blood pressure
- In child aged <1 year, classic signs are rare. Look for:
  - fever, diarrhoea, vomiting, drowsiness
  - convulsions
  - bulging fontanelle.

Lumbar puncture is necessary to determine whether acute meningitis is bacterial and should be done as soon as meningitis is suspected, before starting antimicrobials. In bacterial meningitis, CSF is usually cloudy or purulent (but may be clear or bloody). Basic laboratory examination consists of white cell count (WCC), protein and Gram stain.

<table>
<thead>
<tr>
<th>Bacterial meningitis if:</th>
</tr>
</thead>
<tbody>
<tr>
<td>WCC measurement: &gt;1000 cells/mm3 (&lt;3 in normal CSF) with &gt;60% polymorphs</td>
</tr>
<tr>
<td>Protein: &gt;0.80 g/litre (&lt;0.60 g/litre in normal CSF)</td>
</tr>
<tr>
<td>Gram stain: Gram-negative diplococci in 80% of cases not previously treated</td>
</tr>
</tbody>
</table>

**Differential diagnosis of bacterial meningitis**

Viral meningitis: do lumbar puncture (LP) and examine CSF.
Case management

- Bacterial meningitis, particularly meningococcal meningitis, is potentially fatal and is a medical emergency.
- Viral meningitis is rarely serious and requires only supportive care, but a lumbar puncture is necessary to differentiate from bacterial meningitis.
- Admit all suspected meningitis cases to hospital for diagnosis and case management.
- Perform lumbar puncture and give antimicrobials immediately without waiting for results.
- Do not delay treatment with antimicrobials if lumbar puncture cannot be done.

Table 2. Initial empiric antimicrobial therapy for presumed bacterial meningitis

<table>
<thead>
<tr>
<th>Age group</th>
<th>Probable pathogens</th>
<th>Antimicrobial – first choice</th>
<th>Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td>In epidemic situations: all age groups</td>
<td>N. meningitidis</td>
<td>Oily chloramphenicol</td>
<td>Ampicillin or chloramphenicol</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ceftriaxone or cefotaxime</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cotrimoxazole or benzopenicillin</td>
</tr>
<tr>
<td>In non-epidemic situations:</td>
<td>N. meningitidis</td>
<td>Benzylpenicillin or oily chloramphenicol</td>
<td>Ampicillin or chloramphenicol</td>
</tr>
<tr>
<td>adults aged &gt;5 years</td>
<td>S. pneumoniae</td>
<td></td>
<td>Ceftriaxone or cefotaxime</td>
</tr>
<tr>
<td>children 1 month–5 years</td>
<td>H. influenza</td>
<td>Ampicillin or amoxicillin Chloramphenicol</td>
<td></td>
</tr>
<tr>
<td></td>
<td>S. pneumoniae</td>
<td></td>
<td>Ceftriaxone or cefotaxime</td>
</tr>
<tr>
<td></td>
<td>N. meningitidis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neonates</td>
<td>Gram-negative bacteria</td>
<td>Ampicillin and gentamycin</td>
<td>Ceftriaxone or cefotaxime</td>
</tr>
<tr>
<td></td>
<td>Group B streptococci</td>
<td></td>
<td>Chloramphenicol</td>
</tr>
<tr>
<td></td>
<td>Listeria</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- IV administration of benzylpenicillin, ampicillin, ceftriaxone or cefotaxime is recommended for bacterial meningitis; however ceftriaxone or cefotaxime are very expensive.
- In patients who cannot be given drugs IM or IV, oral administration is acceptable but higher doses are necessary.
- During large epidemics in refugee/displaced populations, a single IM dose of oily chloramphenicol has been used.
- In meningococcal septicaemia with purpura and shock, treat shock by restoring blood volume, give IV dexamethasone to reduce cerebral oedema.
- Chemoprophylaxis of contacts is not recommended in emergency situations.
- Supportive therapy: maintain hydration and adequate nutrition.
- Treat convulsions with diazepam given IV or rectally.
- Nurse in a shaded and well-ventilated area. The unconscious or semiconscious patient should be nursed on his or her side; turning every 2–3 hours can prevent pressure sores.
Table 3. Antimicrobials to treat bacterial meningitis

<table>
<thead>
<tr>
<th>Agent</th>
<th>Route</th>
<th>Daily Dose adults</th>
<th>Daily Dose children</th>
<th>Duration days</th>
<th>Cost^a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzylpenicillin</td>
<td>IV</td>
<td>3–4 million units four/six times</td>
<td>400 000U/kg</td>
<td>&gt;4</td>
<td>low</td>
</tr>
<tr>
<td>Ampicillin/amoxicillin</td>
<td>IV</td>
<td>2–3 g twice</td>
<td>250 mg/kg</td>
<td>&gt;4</td>
<td>moderate</td>
</tr>
<tr>
<td>Amoxicillin</td>
<td>Oral</td>
<td>2–3 g twice</td>
<td>250 mg/kg</td>
<td>&gt;4</td>
<td>high</td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>IV</td>
<td>1g twice/three times</td>
<td>100 mg/kg</td>
<td>&gt;4</td>
<td>moderate</td>
</tr>
<tr>
<td>Chloramphenicol (oily)</td>
<td>IM</td>
<td>3 g single dose</td>
<td>100 mg/kg</td>
<td>1–2</td>
<td>low</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>IV</td>
<td>2 g twice</td>
<td>250 mg/kg</td>
<td>&gt;4</td>
<td>very high</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>IV</td>
<td>1–2 g once/twice</td>
<td>50–80 mg/kg</td>
<td>&gt;4</td>
<td>low</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>IM</td>
<td>1–2 g single dose</td>
<td>50–80 mg/kg</td>
<td>1–2</td>
<td>low</td>
</tr>
<tr>
<td>Co-trimoxazole</td>
<td>IV/IM</td>
<td>2 g SMZ^b twice</td>
<td>100 mg/kg</td>
<td>&gt;4</td>
<td>moderate</td>
</tr>
<tr>
<td>Co-trimoxazole</td>
<td>Oral</td>
<td>2 g SMZ^b twice</td>
<td>100 mg/kg</td>
<td>&gt;4</td>
<td>low</td>
</tr>
<tr>
<td>Sulfadiazine</td>
<td>IV</td>
<td>1 g six times</td>
<td>200 mg/kg</td>
<td>&gt;4</td>
<td>low</td>
</tr>
</tbody>
</table>


^b Sulfamethoxazole.
6. YELLOW FEVER

Basic facts

- Yellow fever is a viral hemorrhagic fever transmitted by mosquitoes infected with the yellow fever virus. The incubation period is 3–7 days.
- Mosquitoes are infected by feeding on patients in the first 3–4 days of illness, when the virus is circulating in the blood.
- The disease is untreatable, and case-fatality rates in severe cases can exceed 50%.
- Yellow fever can be prevented through immunization with the 17D yellow fever vaccine. The vaccine is safe, inexpensive and reliable. A single dose provides protection against the disease for at least 10 years and possibly for life.
- Any person who is not immunized against yellow fever is at risk for the disease.
- An outbreak of yellow fever is defined as at least one confirmed case.
- In an outbreak situation, the target population for an emergency immunization activity is the general population living or working in the same area as the patient. If initial resources are limited, the primary target population is children aged 9 months up to 14 years of age.

Clinical features

- An acute phase lasting for 4–5 days and presenting with:
  - sudden onset of fever
  - headache or backache
  - muscle pain
  - nausea
  - vomiting
  - red eyes (injected conjunctiva).

Because jaundice may not be present in less severe (or mild) cases of yellow fever, this phase of the disease may be confused with other diseases that also present with fever, headache, nausea and vomiting. The less severe cases are often non-fatal.

- A temporary period of remission follows the acute phase in 5–20% of cases. The period of remission lasts for up to 24 hours.

- A toxic phase can follow the period of remission and present with:
  - jaundice
  - dark urine
  - reduced amounts of urine production
  - bleeding from the gums, nose or in the stool
  - vomiting blood
  - hiccups
  - diarrhoea
  - slow pulse in relation to fever

WHO case definition for yellow fever surveillance:

**Suspected case:** an illness characterized by acute onset of fever followed by jaundice within 2 weeks of onset of the first symptoms AND one of the following: bleeding from the nose, gums, skin, or gastrointestinal tract OR death within 3 weeks of the onset of illness.

**Confirmed case:** a suspected case that is confirmed by laboratory results or linked to another confirmed case or outbreak.

**Outbreak:** an outbreak of yellow fever is at least one confirmed case.
Diagnosis

- Laboratory analysis of blood or tissue samples (usually liver) is needed to confirm a case of yellow fever. Two blood samples must be taken.
- Yellow fever is confirmed if laboratory results show:
  - isolation of the yellow fever virus, or
  - presence of yellow fever specific IgM, or
  - a fourfold or greater rise in serum IgG levels between the acute and convalescent serum samples,
- OR
  - positive postmortem liver histopathology, or
  - detection of yellow fever antigen in tissues by immunohistochemistry, or
  - detection of yellow fever virus RNA genomic sequences in blood or tissues.

Note: liver samples are taken from fatal cases only.

Case management

- No specific treatment is available for yellow fever. In the toxic phase, supportive treatment includes therapies for treating dehydration and fever. In severe cases, death can occur 7–10 days after onset of the first symptoms.
- For fever: give paracetamol.
- For dehydration: give oral rehydration salts or IV fluids depending on the assessment of dehydration.
- For restlessness: give diazepam.
- For malaria: give an antimalarial recommended for your area.
- For bacterial infections: give antibacterials recommended for your area.
7. EBOLA AND MARBURG VIRAL HAEMORRHAGIC FEVER

Basic facts

- Ebola and Marburg viral haemorrhagic fever (VHF) are acute viral illnesses caused by the Marburg and Ebola viruses, which belong to the Filovirus group.
- It is transmitted from person to person by direct contact (spread) by droplets onto mucous membranes or indirectly by infected blood, secretions, organs, semen and vomit. Under natural conditions, airborne transmission among humans has not been documented. Nosocomial infections have been frequent.
- The reservoir is not known, and it is therefore difficult to evaluate the risk of transmission. The implementation of control measures can be difficult due also to cultural reasons, such as the custom of eating primate meat.

Clinical features

- Incubation period is usually for Marburg VHF is 3–9 days, and 2–21 days for Ebola VHF
- Presentation may be very nonspecific. Initial symptoms include acute fever, diarrhoea that can be bloody (referred to as diarrhée rouge in francophone Africa) and vomiting. Headache, nausea and abdominal pain are common. Conjunctival injection, dysphagia and haemorrhagic symptoms (nosebleeds, bleeding gums, vomiting of blood, blood in stools, purpura) may further develop. Some patients may show a maculopapular rash on the trunk. Dehydration and significant wasting occur as the disease progresses.
- At a later stage, there is frequent involvement of the central nervous system, manifested by somnolence, delirium or coma.
- The case-fatality rate ranges from 50% to 90% according to the virus.

Case classification

- Suspected: a case that is compatible with the clinical description.
- Probable (in epidemic situation):
  - Any person having had contact with a clinical case and presenting with acute fever, or
  - Any person presenting with acute fever and three of the following: headache, vomiting/nausea, loss of appetite, diarrhoea, intense fatigue, abdominal pain, general or articular pain, difficulty in swallowing, difficulty in breathing, hiccups, or
  - Any unexplained death.
- Confirmed: any suspected or probable case that is laboratory-confirmed.

Contact (in epidemic situation): an asymptomatic person having had physical contact within the past 21 days with a confirmed or probable case or his or her body fluids (e.g. care for patient, participation in a burial ceremony, handling of potentially infected laboratory specimens).

Diagnosis

This can only be done in a laboratory or biosafety level 4 reference laboratory.

Specific diagnosis of VHF can be made in the following ways:

- isolating the virus from blood, urine or throat swabs and other tissues;
- positive ELISA antigen detection or IgM capture, or
- positive virus isolation (only in a laboratory of biosafety level 4), or
- positive skin biopsy (immunohistochemistry), or
The most common diagnostic test is the enzyme-linked immunosorbent assay (ELISA), which can detect IgM antibody (acute infection) and IgG antibody (recent infection) as well as the virus antigen.

Case management

There is no specific therapy currently available for filoviral infections.

Supportive treatment includes the use of:
- analgesic drugs
- antimicrobial drugs (to avoid secondary infections)
- fluid replacement with careful maintenance of fluid and electrolyte balance, circulatory volume, blood pressure. Most of the fluid replacement should be done orally.
- oxygenation
- treatment of any other complicating infection (e.g. malaria, measles)
- mechanical ventilation, renal dialysis, and anti-seizure therapy may be required.

Remember: All medication should be given by the oral or intravenous route. Intramuscular and subcutaneous injections are contraindicated because of the risk of haematomas.

- Implementation of barrier nursing practices is of crucial importance when managing VHF patients. In order to prevent secondary infections, contact with the patient’s lesions and body fluids should be minimized using standard isolation precautions:
  - isolation of patients
  - restriction of access to patients wards
  - use of protective clothing
  - safe disposal of waste
  - disinfection of all non-disposable supplies and equipment
  - safe burial practices.

These can be implemented despite problems due to limited resources (see WHO/CDC. Infection control for viral hemorrhagic fevers in the African care setting. Geneva, WHO, 1998; WHO/EMC/EST/98.2).

Protective measures

Patients with probable or confirmed VHF should be isolated and cared for using barrier-nursing techniques. Isolation precautions to reduce the risk of transmission of Lassa fever in the health-care setting should follow the guidelines developed by WHO/CDC. Universal precautions must be observed when handling specimens of blood or tissues, and when disposing of waste material, needles, and other sharp instruments.

See:
- "VHF outbreak control" in Annex 5: Guidelines for outbreak control, in this Toolkit.
- Infection control for viral haemorrhagic fevers in the African health care setting, available online at: http://www.who.int/emc-documents/haem_fevers/whoemcesr982c.html
- "Prevention" in Section 7: HIV/AIDS in the Communicable disease profile of this Toolkit.
- Appendix 8 in Guidelines for collection of specimens for laboratory testing, in this Toolkit.

Hospital control

Basic barrier nursing methods (gloves, gowns and masks) are highly effective in preventing secondary spread of the infection. Strict isolation with rigorous barrier nursing should be combined with full medical care, to ensure the safety of the staff and survival of the patient.

Epidemics of the disease in health-care institutions with poor hygiene standards can be dramatically amplified through contact with patients or body fluids from infected patients (blood, vomit, urine, stools, ...
semen, saliva). The potential for explosive nosocomial infections constitutes the main threat to public health posed by the disease. Strict adherence to isolation precautions with all patients has been shown to reduce the risk of transmission: during the 1995 Ebola haemorrhagic fever outbreak in Kikwit, no new cases were reported among health workers who used these precautions consistently.

The following will help prevent explosive epidemics in areas potentially subject to Ebola–Marburg disease:

— Social mobilization and health education of the community.

— Advance training of health workers on the use of isolation precautions, proper barrier-nursing methods and the regular consistent practice of universal precautions.
**APPENDIX 1: ASSESSMENT AND TREATMENT OF DIARRHOEA**

**Table A1. Assessment of diarrhoeal patients for dehydration**

<table>
<thead>
<tr>
<th>First assess your patient for dehydration</th>
<th>PLAN A</th>
<th>PLAN B</th>
<th>PLAN C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Look at:</strong> General condition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well, alert</td>
<td></td>
<td><em>Restless, irritable</em></td>
<td><em>Lethargic or unconscious; floppy</em></td>
</tr>
<tr>
<td><strong>Eyes</strong></td>
<td>Normal</td>
<td>Sunken</td>
<td>Very sunken and dry</td>
</tr>
<tr>
<td><strong>Tears</strong></td>
<td>Present</td>
<td>Absent</td>
<td>Absent</td>
</tr>
<tr>
<td><strong>Mouth and tongue</strong></td>
<td>Moist</td>
<td>Dry</td>
<td>Very dry</td>
</tr>
<tr>
<td><strong>Thirst</strong></td>
<td>Drinks normally, not thirsty</td>
<td><em>Thirsty, drinks eagerly</em></td>
<td><em>Drinks poorly or not able to drink</em></td>
</tr>
<tr>
<td><strong>2. Feel:</strong> Skin pinch</td>
<td>Goes back quickly</td>
<td><em>Goes back slowly</em></td>
<td><em>Goes back very slowly</em></td>
</tr>
<tr>
<td><strong>3. Decide:</strong></td>
<td>The patient has no signs of dehydration</td>
<td>If the patient has two or more signs, including at least one <em>sign</em> there is some dehydration</td>
<td>If the patient has two or more signs, including at least one <em>sign</em> there is severe dehydration</td>
</tr>
<tr>
<td><strong>4. Treat:</strong></td>
<td>Use Treatment Plan A</td>
<td>Weigh the patient if possible and use Treatment Plan B</td>
<td>Weigh the patient and use Treatment Plan C URGENTLY</td>
</tr>
</tbody>
</table>

---

a In some infants and children the eyes normally appear somewhat sunken. It is helpful to ask the mother if the child’s eyes are normal or more sunken than usual.

b Dryness of the mouth and tongue can also be palpated with a clean finger. The mouth may always be dry in a child who habitually breathes through the mouth. The mouth may be wet in a dehydrated patient owing to recent vomiting or drinking.

c The skin pinch is less useful in infants or children with marasmus (wasting) or kwashiorkor (severe malnutrition with oedema) or in obese children.


**Treatment plan A: to treat diarrhoea at home**

Use this plan to teach the mother to:

- continue to treat her child’s current episode of diarrhoea at home; and
- give early treatment for future episodes of diarrhoea.

Explain the three rules for treating diarrhoea at home:

1. **Give the child more fluids than usual to prevent dehydration**
   - Use recommended home fluids. These include ORS solution, food-based fluids (such as soup, rice water and yoghurt drinks) and plain water. Use ORS solution as described in the box below.
   (Note: if the child is aged under 6 months and not yet taking solid food, give ORS solution or water rather than food-based fluid.)
2. Give the child plenty of food to prevent malnutrition

- Continue to breastfeed frequently.
- If the child is not breastfed, give the usual milk.
- If the child is aged 6 months or older, or already taking solid food:
  - also give cereal or another starchy food mixed, if possible, with pulses, vegetables and meat or fish; add one or two teaspoonfuls of vegetable oil to each serving;
  - give fresh fruit juice or mashed banana to provide potassium;
  - give freshly prepared foods; cook and mash or grind food well;
  - encourage the child to eat: offer food at least six times a day; and
  - give the same food after diarrhoea stops, and give an extra meal each day for 2 weeks.

3. Take the child to the health worker if he or she does not get better in 3 days or develops any of the following:

- many watery stools
- eating or drinking poorly
- repeated vomiting
- fever
- marked thirst
- blood in the stool

Children should be given ORS solutions at home if:

- they have been on Treatment Plan B or C;
- they cannot return to the health worker if the diarrhoea gets worse; or
- if it is national policy to give ORS to all children who see a health worker for diarrhoea.

If the child is to be given ORS solution at home, show the mother how much ORS to give after each loose stool and give her enough packets for 2 days.

<table>
<thead>
<tr>
<th>Age</th>
<th>Amount of ORS to be given after each loose stool</th>
<th>Amount of ORS to provide for use at home</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 24 months</td>
<td>50–100 ml (1/4 – ½ cup)</td>
<td>500 ml/day</td>
</tr>
<tr>
<td>2–10 years</td>
<td>100–200 ml (½ – 1 cup)</td>
<td>1000 ml/day</td>
</tr>
<tr>
<td>10 years or more</td>
<td>as much as wanted</td>
<td>2000 ml/day</td>
</tr>
</tbody>
</table>

- Describe and show the amount to be given after each stool, using a local measure.

Show the mother how to mix and to give ORS

- Give a teaspoonful every 1–2 minutes for a child aged under 2 years.
- Give frequent sips from a cup for older children.
- If the child vomits, wait 10 minutes. Then give the solution more slowly (for example, a spoonful every 2–3 minutes).
- If diarrhoea continues after the ORS packets are used up, tell the mother to give other fluids as described in the first rule above or return for more ORS.
**Treatment plan B: to treat dehydration**

Table A2. Approximate amount of ORS solution to give in the first 4 hours

<table>
<thead>
<tr>
<th>Age</th>
<th>&lt;4 months</th>
<th>4–11 months</th>
<th>12–23 months</th>
<th>2–4 years</th>
<th>5–14 years</th>
<th>15 years +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>0 – &lt;5 kg</td>
<td>5–7.9 kg</td>
<td>8–10.9 kg</td>
<td>11–15.9 kg</td>
<td>16–29.9 kg</td>
<td>30 kg +</td>
</tr>
<tr>
<td>In ml</td>
<td>200–400</td>
<td>400–600</td>
<td>600–800</td>
<td>800–1200</td>
<td>1200–2200</td>
<td>2200–4000</td>
</tr>
</tbody>
</table>

* Use the patient’s age only when you do not know the weight. The approximate amount of ORS required (in ml) can also be calculated by multiplying the patient’s weight (in grams) times 0.075.

- If the child wants more ORS than shown, give more.
- Encourage the mother to continue breastfeeding.
- For infants aged under 6 months who are not breastfed, also give 100–200 ml clean water during this period.

**Observe the child carefully and help the mother give ORS solution.**

- Show her how much solution to give the child.
- Show her how to give it – a teaspoonful every 1–2 minutes for a child aged under 2 years, frequent sips from a cup for an older child.
- Check from time to time to see if there are problems.
- If the child vomits, wait 10 minutes and then continue giving ORS, but more slowly, for example, a spoonful every 2–3 minutes.
- If the child’s eyelids become puffy, stop the ORS and give plain water or breast-milk. Give ORS according to Plan A when the puffiness is gone.

**After 4 hours, reassess the child using the assessment chart, then select Plan A, B or C to continue treatment**

- If there are no signs of dehydration, shift to Plan A. When dehydration has been corrected, the child usually passes urine and may also be tired and fall asleep.
- If signs indicating some dehydration are still present, repeat Plan B but start to offer food, milk and juice as described in Plan A.
- If signs indicating severe dehydration have appeared, shift to Plan C.

**If the mother must leave before completing Treatment Plan B:**

- Show her how much ORS to give to finish the 4-hour treatment at home;
- Give her enough ORS packets to complete rehydration, and for 2 more days as shown in Plan A;
- Show her how to prepare ORS solution; and
- Explain to her the three rules in Plan A for treating her child at home:
  - to give ORS or other fluids until diarrhoea stops
  - to feed the child
  - to bring the child back to the health worker, if necessary.
Treatment plan C: to treat severe dehydration quickly

Follow the arrows. If the answer is "yes" go across. If "no" go down.

Can you give intravenous (IV) fluids immediately?

Yes

Start IV fluids immediately. If the patient can drink, give ORS by mouth while the drip is set up. Give 100 ml Ringer’s lactate solution per kg of body weight (or if not available, give normal saline), divided as follows:

<table>
<thead>
<tr>
<th>Age</th>
<th>First give 30 ml/kg in:</th>
<th>Then give 70 ml/kg in:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants (under 12 months)</td>
<td>1 hour*</td>
<td>5 hours</td>
</tr>
<tr>
<td>Older</td>
<td>30 minutes*</td>
<td>2 1/2 hours</td>
</tr>
</tbody>
</table>

* Repeat once if radial pulse is still very weak or undetectable.

Reassess the patient every 1–2 hours. If hydration is not improving, give the IV drip more rapidly.

Also give ORS (about 5 ml/kg per hour) as soon as the patient can drink: usually after 2–4 hours (infants) or 1–2 hours (older patients).

After 6 hours (infants) or 3 hours (older patients), evaluate the patient using the assessment chart. Then choose the appropriate Plan (A, B or C) to continue treatment.

No

Is IV treatment available nearby (within 30 minutes)?

Yes

Send the patient immediately for IV treatment.

If the patient can drink, provide the mother with ORS solution and show her how to give it during the trip.

No

Are you trained to use a nasogastric tube for rehydration?

Yes

Start rehydration by tube with ORS solution: give 20 ml/kg per hour for 6 hours (total of 120 ml/kg).

Reassess the patient every 1–2 hours:
- if there is repeated vomiting or increased abdominal distension, give the fluid more slowly;
- if hydration is not improved after 3 hours, send the patient for IV therapy.

After 6 hours, reassess the patient and choose the appropriate treatment plan.

No

Can the patient drink?

Yes

Start rehydration by mouth with ORS solution, giving 20 ml/kg/hour for 6 hours (total of 120 ml/kg).

Reassess the patient every 1–2 hours:
- if there is repeated vomiting, give the fluid more slowly;
- if hydration is not improved after 3 hours, send the patient for IV therapy.

After 6 hours, reassess the patient and choose the appropriate treatment plan.

No

Urgent: send the patient for IV or nasogastric treatment.

If possible, observe the patient for at least 6 hours after rehydration to be sure the mother can maintain hydration giving ORS solution by mouth. If the patient is older than 2 years and there is cholera in the area, give an appropriate oral antibiotic after the patient has become alert.
Democratic Republic of the Congo

1. Health surveillance forms

2. Surveillance system guidelines and alert thresholds

3. Case definitions

4. Guidelines for outbreak control

5. Case management of epidemic-prone diseases

6. Guidelines for collection of specimens for laboratory testing

7. Outbreak investigation kit
INTRODUCTION

There is a high risk of communicable disease outbreaks in emergency situations. Outbreaks must be recognized and controlled rapidly in order to minimise their impact. Effective containment of an outbreak depends on:

- early detection and reporting of suspect cases
- rapid epidemiological investigation
- rapid laboratory confirmation of the diagnosis
- implementation of effective control measures.

Rapid identification of the causative agent and the likely source or mode of transmission is essential. The initial investigation involves two important processes: collection of information on suspect cases, and collection of clinical specimens for laboratory diagnosis. Successful laboratory confirmation of a disease depends on:

- advance planning
- collection of appropriate and adequate specimens
- correct packaging of specimens and rapid transport to an appropriate laboratory
- the ability of the laboratory to carry out the diagnostic tests
- proper biosafety and decontamination procedures to reduce the risk of further spread of the disease.

The purpose of this document is to ensure that the correct specimens are collected, packaged and transported in a safe and standardized manner during a field investigation of an outbreak in Democratic Republic of the Congo or its neighbouring countries.

1. Planning for specimen collection

Once a suspected outbreak has been detected and reported, an epidemiological investigation must be quickly organized. The materials and procedures required for efficient specimen collection and their transport to the laboratory for testing are outlined below.

1.1 Define the possible causes of the outbreak

An assessment of current clinical and epidemiological information is the starting point for considering the potential etiology of the outbreak. The historical knowledge of regional endemic and epidemic diseases, as well as their seasonality, further defines the possible causes. Since a variety of infectious agents can present with a similar clinical picture, the outbreak should be approached in a syndromic manner to obtain the differential diagnosis. One or more specimen types may be required to define the cause of the outbreak.

1.2 Decide which clinical specimens are required to confirm the cause of the outbreak

After defining the clinical syndrome and suspect pathogen(s), decide on the clinical specimens to be collected for appropriate laboratory diagnosis.

1.3 Laboratory for specimen testing

In the event of an outbreak, WHO will coordinate the transport of specimens and follow up on result of laboratory tests.

1.4 Collecting the specimens

For stool samples, the health worker should collect the sample, place in cold box and inform WHO. Transport to the laboratory should be done as soon as possible. For CSF the admitting physician should conduct the lumbar puncture and obtain the sample. Blood samples should be taken by the health worker.

2. Specimen collection and processing

Investigation should start as early as possible after a suspected outbreak has been notified. Specimens obtained in the acute phase of the disease, preferably before administration of antimicrobial drugs, are more likely to yield detectable concentrations of antibody, antigen or infective pathogen. Before beginning specimen collection, explain the procedure to the patient and relatives. When collecting the specimen avoid contamination and take a sufficient quantity of material (as guided by the laboratory tests). Follow the appropriate precautions for safety during collection and processing of specimens.

2.1 Labelling and identification of specimens

In an outbreak investigation the information contained in the case investigation and laboratory request forms is collected along with the specimen. Each patient should be assigned a unique identification number by the collection team. This is the link between the laboratory results on the line-listing form, the specimens and the patient, which guides further investigation and response to the outbreak. This unique identification number and the patient’s name should be present on all specimens, epidemiological data forms and the laboratory request and should be used as a common reference.

2.2 Labelling specimen container/slide

Labels must always be used. The label should be permanently affixed to the specimen container. It should include:

- patient name
- unique identification number
- specimen type and date and place of collection
- name or initials of specimen collector.
2.3 Case investigation and laboratory forms

A case investigation form should be completed for each patient at the time of specimen collection. The original case investigation form remains with the investigation team, and should be kept together for analysis and later reference. A laboratory form must also be completed for each specimen. The epidemiological and clinical data gathered in the investigation can later be easily tied to the laboratory results for analysis.

The form includes:

- Patient information – name, age (or date of birth), sex, and complete address.
- Clinical information – date of onset of symptoms, clinical and immunisation history, risk factors, antimicrobial taken before specimen collection.
- Laboratory information – acute or convalescent specimen, other specimens from same patient.

The form records the date and time when the specimen is received and the name of the person collecting the specimen.

3. Storage of specimens

To preserve bacterial or viral viability in specimens for microbiological culture or inoculation, they should be placed in appropriate media and stored at recommended temperatures. These conditions must be preserved throughout transport to the laboratory and will vary according to transportation time. These conditions must be preserved throughout transportation to the laboratory and will vary according to the nature of specimens, pathogens (sensitivity to desiccation, temperature, nutrients and pH) and the time required to transport the specimens to the laboratory.

Many specimens taken for viral isolation are viable for 2 days if maintained in type-specific media at 4–8 °C. Freeze these specimens in accordance with expert advice, as infectivity may be altered.

Specimens for bacterial culture should be kept in appropriate transport media at the recommended temperature. This ensures bacterial viability while minimizing overgrowth of other microorganisms. With the exception of CSF, urine and sputum, most specimens may be kept at ambient temperature if they will be processed within 24 hours. For longer delays, storage at 4–8 °C would be advisable except in the case of particularly cold-sensitive organisms such as Shigella, Meningococcus, and Pneumococcus. Longer delays are not advisable as the yield of bacteria may fall significantly.

Specimens for antigen or antibody detection may be stored at 4–8 °C for 24–48 hours, or at −20 °C for longer periods. Sera for antibody detection may be stored at 4–8 °C for up to 10 days. Although not ideal, sera stored at room temperature may still be useful for antibody testing even after prolonged periods (weeks). Sera that have been collected should therefore not be discarded simply because there are no refrigeration facilities available.
### APPENDIX 1:
Laboratories for confirmation of priority diseases in Democratic Republic of the Congo

<table>
<thead>
<tr>
<th>Suspected organism/disease</th>
<th>Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Vibrio cholerae</em> (O1): (stool)</td>
<td>Laboratories de province (Lubumbashi, Matadi, Ami Kivu, Bonzola)</td>
</tr>
<tr>
<td></td>
<td>Institut National de Recherche Bio Médicale (INRB) for confirmation.</td>
</tr>
<tr>
<td><em>Shigella dysenteriae</em> type 1: (stool)</td>
<td>Laboratories de province (Lubumbashi, Matadi, Ami Kivu, Bonzola)</td>
</tr>
<tr>
<td></td>
<td>Institut National de Recherche Bio Médicale (INRB) for confirmation.</td>
</tr>
<tr>
<td>Meningitis: cerebrospinal fluid (CSF)</td>
<td>Laboratories de province (Lubumbashi, Matadi, Ami Kivu, Bonzola)</td>
</tr>
<tr>
<td></td>
<td>Gram-stain at periphery laboratories (health centres and district hospitals).</td>
</tr>
<tr>
<td></td>
<td>Rapid tests (Latex agglutination) with slidex meningite Kit 5 for meningococcal available with some NGOs in Democratic Republic of Congo (MSF).</td>
</tr>
<tr>
<td></td>
<td>Institut National de Recherche Bio Médicale (INRB) for confirmation, serotypage and susceptibility test.</td>
</tr>
<tr>
<td></td>
<td>Transportate for culture to Institut Pasteur (IP) Paris, France, OSLO Laboratory or NHLS of South Africa.</td>
</tr>
<tr>
<td>Measles: blood, serum (2 tubes)</td>
<td>Institut National de Recherche Bio Médicale (INRB) for serology (IgG, IgM)</td>
</tr>
<tr>
<td></td>
<td>Institut Pasteur (IP), Abidjan for confirmation.</td>
</tr>
<tr>
<td>Yellow fever: blood, serum (2 tubes)</td>
<td>Institut National de Recherche Bio Médicale (INRB) for serology (IgG, IgM)</td>
</tr>
<tr>
<td></td>
<td>Institut Pasteur (IP), Senegal for confirmation</td>
</tr>
<tr>
<td>Acute flaccid paralysis (stool)</td>
<td>Institut National de Recherche Bio Médicale (INRB) for confirmation.</td>
</tr>
<tr>
<td>Haemorrhagic fevers (blood, urine)</td>
<td>Institut National de Recherche Bio-Médicale, INRB, Avenue des huileries, Kinshasa/Gombe BP 1197, Kinshasa 1, RDC</td>
</tr>
<tr>
<td></td>
<td>Special Pathogens Unit, National Institute for Communicable Diseases Private Bag X4, Sandringham 2131, South Africa</td>
</tr>
<tr>
<td></td>
<td>CDC NCID/SPB, 1600 Clifton Road, Atlanta, Georgia 30333, United States of America</td>
</tr>
<tr>
<td></td>
<td>Centre International de Recherches Médicales de Franceville, BP 769, Franceville, Gabon</td>
</tr>
<tr>
<td></td>
<td>Bernhard-Nocht-Institut für Tropenmedizin (BNI), Bernhard-Nocht-Str. 74, 20359 Hamburg, Germany</td>
</tr>
</tbody>
</table>
APPENDIX 2: Blood specimen collection

Blood and separated serum are the most common specimens taken in outbreaks of communicable disease. Venous blood can be used for isolation and identification of the pathogen in culture and by inoculation, or separated into serum for the detection of genetic material (e.g. by polymerase chain reaction), specific antibodies (by serology), antigens or toxins (e.g. by immunofluorescence). For the processing of most specimens for diagnosis of viral pathogens, serum is preferable to unseparated blood except where otherwise directed. When specific antibodies are being assayed, it is often helpful to collect paired sera, i.e. an acute sample at the onset of illness and a convalescent sample 1–4 weeks later. Blood can also collected by finger-prick for the preparation of slides for microscopy or for absorption onto special filter-paper discs for analysis. Whenever possible, blood specimens for culture should be taken before antibiotics are administered to the patient.

Note: Collection of blood and other samples for investigation of viral hemorrhagic fevers is described in Annex 5: Guidelines for outbreak control in this Toolkit.

Venous blood samples

Materials for collection
- Skin disinfection: 70% alcohol (isopropyl alcohol, ethanol) or 10% povidone iodine, swabs, gauze pads, adhesive dressings.
- Disposable latex or vinyl gloves.
- Tourniquet, Vacutainer or similar vacuum blood collection devices, or disposable syringes and needles.
- Vacutainer or sterile screw-cap tubes (or cryotubes if indicated), blood culture bottles (50 ml for adults, 25 ml for children) with appropriate media.
- Labels and indelible marker pen.

Method of collection
- Full infection control measures must be taken, with gowns, gloves, masks and boots for suspected viral haemorrhagic fever such as Marburg fever or Ebola (See Annex 7).
- Place a tourniquet above the venepuncture site. Disinfect the tops of blood culture bottles.
- Palpate and locate the vein. The venepuncture site must be meticulously disinfected with 10% povidone iodine or 70% isopropyl alcohol by swabbing the skin concentrically from the centre of the venipuncture site outwards. Let the disinfectant evaporate. Do not repalpate the vein again. Perform venepuncture.
- If using conventional disposable syringes, withdraw 5–10 ml of whole blood from adults, 2–5 ml from children and 0.5–2 ml from infants. Using aseptic technique, transfer the specimen to relevant transport tubes and culture bottles. Secure caps tightly.
- If using a vacuum systems, withdraw the desired amount of blood directly into each transport tube and culture bottle.
- Remove the tourniquet. Apply pressure to site until bleeding stops, and apply dressing.
- Label the tube, including the unique patient identification number, using indelible marker pen.
- Do not recap used sharps. Discard directly into the sharps disposal container.
- Complete the case investigation and the laboratory request forms using the same identification number.

Handling and transport
- Blood specimen bottles and tubes should be transported upright and secured in a screw-cap container or in a rack in a transport box. They should have enough absorbent paper around them to soak up all the liquid in case of spill.
- For serum samples (e.g. measles, yellow fever, HIV) – the blood cells must be separated from serum. Let the clot retract for 30 minutes then centrifuge at 2000 rpm for 10–20 minutes and pour off serum. If no centrifuge is available, place sample in refrigerator overnight (4–6 hours) and pour off the serum for transport in a clean glass tube.
- Do not attempt this in a case of suspected viral haemorrhagic fever unless you are a clinician/laboratory technician experienced in management of the disease. Full protection and infection control measures must be taken.
- Blood culture: If the specimen will reach the laboratory within 24 hours, most pathogens can be recovered from blood cultures transported at ambient temperature. Keep at 4–8 °C for longer transit periods, unless the bacterial pathogen is cold-sensitive.
APPENDIX 3:  Cerebrospinal fluid (CSF) specimen collection

The specimen must be taken by a physician or a person experienced in the lumbar puncture procedure. CSF is used in the diagnosis of viral, bacterial, parasitic and fungal meningitis/encephalitis.

Materials for collection

Lumbar puncture tray which includes:
- sterile materials: gloves, cotton wool, towels or drapes
- local anaesthetic, needle, syringe
- skin disinfectant: 10% povidone iodine or 70% alcohol
- two lumbar puncture needles, small bore with stylet
- six small sterile screw-cap tubes and tube rack
- water manometer
- microscope slides and slide boxes
- trans-Isolate media if available (must be kept at 4–8 °C while in storage; allow to reach room temperature before introducing CSF).

Method of collection

• As only experienced personnel should be involved in the collection of CSF samples, the method is not described in this document. CSF is collected directly into the screw-cap tubes. If the samples will not be transported immediately, separate tubes should be collected for bacterial and viral processing.
• If Trans-Isolate media is available, first ensure that the media has reached room temperature, draw the collected CSF from the sterile tube and inject into the vacuum-sealed Trans-Isolate bottle. The bottle must be kept for at least 3 days at over 25 °C to allow incubation.

Handling and transport

• In general, specimens should be delivered to the laboratory and processed as soon as possible.
• CSF specimens for bacteriology are transported at ambient temperature, generally without transport media. They must never be refrigerated as these pathogens do not survive well at low temperatures. If Trans-Isolate media are available, follow the instructions on the packaging precisely.
• CSF specimens for virology do not need transport medium. They may be transported at 4–8 °C for up to 48 hours, or at –70 °C for longer periods.
APPENDIX 4: Faecal specimen collection

Stool specimens are most useful for microbiological diagnosis if collected soon after onset of diarrhoea (for viruses <48 hours and for bacteria <4 days), and preferably before the initiation of antibiotic therapy. If required, two or three specimens may be collected on separate days. Stool is the preferred specimen for culture of bacterial, viral and parasitic diarrheal pathogens. Rectal swabs showing faeces may also be taken from infants but are not useful for the diagnosis of viruses.

Materials for collection
- Tubes with Cary-Blair transport medium
- Clean, dry, leak-proof, screw-cap container and tape if Cary-Blair transport medium is not available.
- Appropriate bacterial transport media for transport of rectal swabs from infants (ideally Cary-Blair).
- Parasitology transport pack: 10% formalin in water, polyvinyl isopropyl alcohol (PVA).

Method of collecting a stool specimen
If Cary-Blair transport medium is available:
- Place sterile swab in freshly passed stool to allow it to soak up stool.
- Place swab in the Cary-Blair transport medium inside the tube.
- Break off the top part of the stick without touching the tube and tighten the screw cap firmly.
- Label the specimen tube.

If Cary-Blair transport medium not available:
- Collect freshly passed stool, 5 ml liquid or 5 g solid (pea-size), in a container.
- Label the container.

Method of collecting a rectal swab from infants
- Moisten a swab in sterile saline.
- Insert the swab tip just past the anal sphincter and rotate gently.
- Withdraw the swab and examine to ensure that the cotton tip is stained with faeces.
- Place the swab in sterile tube/container containing the appropriate transport medium.
- Break off the top part of the stick without touching the tube and tighten the screw cap firmly.
- Label the specimen tube.

Handling and transport
- Stool specimens should be transported in a cold-box at 4–8 °C. Bacterial yields may fall significantly if specimens are not processed within 1–2 days of collection. Shigella is particularly sensitive to elevated temperatures. If transport medium is not available, do not allow the specimen to dry – add few drops of 0.85% sodium chloride solution.
- Specimens to be examined for parasites should be mixed with 10% formalin or PVA, 3 parts stool to 1 part preservative. Transport at ambient temperature in containers sealed in plastic bags.
APPENDIX 5: Respiratory tract specimen collection

Specimens are collected from the upper or lower respiratory tract, depending on the site of infection. Upper respiratory tract pathogens (viral and bacterial) are found in throat and nasopharyngeal specimens. Lower respiratory tract pathogens are found in sputum specimens. For certain organisms, such as *Legionella* culture is difficult, and presumptive diagnosis is based on the detection of antigen excreted in the urine or respiratory secretions.

When acute epiglottitis is suspected, no attempt should be made to take throat or pharyngeal specimens since these procedures may precipitate respiratory obstruction. Epiglottitis is generally confirmed by lateral neck X-ray, but the etiologic agent may be isolated on blood culture.

Materials for collection
- Transport media – bacterial (Trans Amies) and viral (Cellmatics)
- Dacron and cotton swabs
- Tongue depressor
- Flexible wire calcium alginate tipped swab (for suspected pertussis)
- Nasal speculum (for suspected pertussis – not essential)
- Suction apparatus or 20–50-ml syringe
- Sterile screw-cap tubes, and wide-mouthed clean sterile jars (minimum volume 25 ml)

Upper respiratory tract specimens

*Method of collecting a throat swab*
- Hold the tongue down with the depressor. Use a strong light source to locate areas of inflammation, and exudate in the posterior pharynx and the tonsillar region of the throat behind the uvula.
- Rub the area back and forth with a Dacron or calcium alginate swab. Withdraw the swab without touching cheeks, teeth or gums and insert into a screw-cap tube containing transport medium.
- Break off the top part of the stick without touching the tube, and tighten the screw cap firmly.
- Label the specimen containers.
- Complete the laboratory request form.

*Method of collecting nasopharyngeal swabs (for suspected pertussis)*
- Seat the patient comfortably, tilt the head back and insert the nasal speculum.
- Insert a flexible calcium alginate/Dacron swab through the speculum parallel to the floor of nose without pointing upwards. Alternately, bend the wire and insert it into the throat and move the swab upwards into the nasopharyngeal space.
- Rotate the swab on the nasopharyngeal membrane a few times, remove it carefully and insert it into a screw-cap tube containing transport medium.
- Break off the top part of the stick without touching the tube, and tighten the screw cap firmly.
- Label the specimen tube, indicating left or right side.
- Complete the laboratory request form.
- Repeat on the other side.
Lower respiratory tract specimens

Method of collecting sputum
- Instruct patient to take a deep breath and cough up sputum directly into a wide-mouthed sterile container. Avoid saliva or postnasal discharge. Minimum volume should be about 1 ml.
- Label the specimen containers.
- Complete the laboratory request form.

Handling and transport
- All respiratory specimens except sputum are transported in appropriate bacterial/viral media.
- Transport as quickly as possible to the laboratory to reduce overgrowth by commensal oral flora.
- For transit periods up to 24 hours, transport bacterial specimens at ambient temperature and viruses at 4–8°C in appropriate media.
APPENDIX 6: Urine specimen collection

Material for collection
- Sterile plastic cup with lid (50 ml or more).
- Clean, screw-top specimen transport containers ("universal" containers are often used).
- Gauze pads.
- Soap and clean water (or normal saline) if possible.
- Labels and indelible marker pen.

Method of collection
- Give the patient clear instructions to pass urine for a few seconds and then to hold the cup in the urine stream for a few seconds to catch a mid-stream urine sample. This should reduce the risk of contamination from organisms living in the urethra.
- To reduce the risk of contamination from skin organisms, the patient should be directed to avoid touching the inside or rim of the plastic cup with the skin of the hands, legs or external genitalia. Tighten the cap firmly when finished.
- For hospitalized or debilitated patients, it may be necessary to wash the external genitalia with soapy water to reduce the risk of contamination. If soap and clean water are not available, the area may be rinsed with normal saline. Dry the area thoroughly with gauze pads before collecting the urine.
- Urine collection bags may be necessary for infants. If used, transfer urine from the urine bag to specimen containers as soon as possible to prevent contamination with skin bacteria. Use a disposable transfer pipette to transfer the urine.
- Label the specimen containers.

Handling and transport
- Transport to the laboratory within 2–3 hours of collection. If this is not possible, do not freeze but keep the specimen refrigerated at 4-8°C. Keeping the specimen refrigerated will reduce the risk of overgrowth of contaminating organisms.
- Ensure that transport containers are leak-proof and tightly sealed.
APPENDIX 7:  
Sample collection for suspected viral haemorrhagic fever

All invasive procedures and investigations should be minimized until the diagnosis of viral haemorrhagic fever (VHF) is confirmed or excluded. Only the specific diagnostic samples needed should be obtained from acutely ill humans.

Other routine blood samples should be avoided when investigating a case of VHF.

The blood samples should be kept in their original tube (sealed sterile dry tubes, Monovettes or Vacutainer® type).

Do not attempt to separate serum or plasma from blood clots in the field – this may be highly risky in case of VHF. If these procedures are needed they should be performed at the reference laboratory.

Each collected sample must be identified as “high risk”. Labels prepared in advance for both specimens collected and laboratory request forms should bear the name, the date of collection and a coded link to the corresponding record of the case.

Precautions for sampling

In addition to basic safety precautions, certain other specific precautions and additional safety equipment are essential when investigating cases of VHF to protect skin and mucous membranes against these pathogens:

- Blood specimens should be taken by a doctor or nurse experienced in the procedure. Urine samples also should be handled carefully: a 20-ml syringe may be used to transfer urine from a bedpan to the specified container.

- Protective clothing should always be worn when handling specimens from suspected VHF cases:
  - protective gown
  - waterproof protective apron
  - two pairs of latex gloves
  - particulate filter face mask
  - goggles
  - rubber boots.

Method of collection

- Observe all the basic safety precautions when obtaining specimens samples from suspected VHF cases.
- For taking blood samples, it is advisable to use a vacuum blood-sampling system (Monovette or Vacutainer®); however, use the equipment and procedure you are most familiar with to avoid the risk of accidents or spills.
- Withdraw 5–10 ml of whole blood from adults, 2–5 ml from children and 0.5 2 ml from infants, directly into the transport tube (blood sample tube).
- Avoid the use of disposable alcohol swabs to apply pressure to venepuncture wounds; it is advisable to use dry cotton-wool balls or gauze swabs.
- After the sample has been taken, the blood sample tube should be externally disinfected by wiping with 0.5% hypochlorite solution (See Appendix 8 below).
Removing protective clothing

- When the procedure is finished, remove the apron. Before removing the outer pair of gloves, wash your hands with soap and water and rinse them in 0.5% hypochlorite solution (see Appendix 8 below) for 1 minute.
- Keep the inner gloves on while removing goggles, mask, anything used to cover the head, and the external gown. Before removing boots (which have also been previously soaked in the same hypochlorite solution), soak them in 0.5% hypochlorite solution. Finally remove the gloves, and then the inner gown. Then wash your hands well with soap and water and disinfect them with 70% isopropyl alcohol or povidone iodine.

Dispose of all protective clothing, gloves, and materials in a plastic bag and incinerate everything.

Remember never to recap used sharps. Discard them directly into a sharps disposal container for later incineration.

Handling and transport of samples of suspected VHF cases

Particular care to prevent external contamination of specimen containers during specimen collection is critical.

A triple packaging system is used:

- The blood sample tube should be transported upright and secured in a leak-proof secondary container with a screw cap and sufficient absorbent material to absorb all the contents should leakage occur. Ensure that the cap is screwed tight and labelled (specimen record). The secondary container should be externally disinfected by wiping with 0.5% hypochlorite solution (see Appendix 8 below).

- Specimen data forms, letters and information that identifies or describes the specimen and also identifies the shipper and receiver should be taped to the outside of the secondary container.

The secondary container is then placed into a third container – the transport box. The outer part of the transport box should be clearly marked with the biohazard label and should bear an address label that clearly identifies the specimen, the shipper and the receiver (see section 2.2: Labelling specimen container/slide as indicated above).

If the blood sample cannot be processed the same day, ice packs must be placed in the transport box to keep the sample cold (around 4–8 °C). Whole blood samples should not be frozen.

Note: All materials needed for the sample handling and transport are included in the “Specimen transport module” in Annex 8: Outbreak investigation kit.
APPENDIX 8: Chemical disinfectants

Chlorine is the recommended disinfectant for use in field outbreak investigations. An all-purpose disinfectant should have a chlorine concentration of 0.1% (= 1 g/litre = 1000 ppm). A stronger solution of 0.5% (= 5 g/litre = 5000 ppm) should be used in situations such as suspected Marburg and Ebola virus outbreaks.

In preparing appropriate dilutions, it is important to remember that different products have different concentrations of available chlorine. The manufacturer may provide appropriate instructions for the preparation of solutions with the above concentrations. Otherwise, the guidelines provided below may be used. Chlorine solutions gradually lose strength, and so fresh solutions must be prepared daily. Clear water should be used because organic matter destroys chlorine.

Commonly used chlorine-based disinfectants include:

**Sodium hypochlorite**
Commercial liquid bleaches, such as household bleach (e.g. Chlorox, *eau-de-javel*) generally contain 5% (50 g/litre or 50 000 ppm) available chlorine.

*To prepare a 0.1% chlorine solution*, make a 1-in-50 dilution, i.e. 1 part bleach in 49 parts water to give final concentrations of available chlorine of 0.1%. (For example, add 20 ml of bleach to approximately 1 litre of water.)

*To make a 0.5% chlorine solution*, make a 1-in-10 dilution, i.e. 1 part bleach in 9 parts water to give final concentrations of available chlorine of 0.5%. (For example, add 100 ml of bleach to 900-ml water.)

**Chloramine powder**
While the bleach solution described above may satisfy all disinfection needs, chloramine powder may prove convenient for disinfecting spills of blood and other potentially infectious body fluids. It may also be useful under field conditions because of ease of transport. It contains approximately 25% available chlorine.

In addition to its use for spills, chloramine powder may be used to prepare liquid chlorine solutions. The recommended formula is 20 g of chloramine powder to 1 litre of clean water.

**Decontamination of surfaces**
Wear an apron, heavy-duty gloves and other barrier protection if needed, and wipe surfaces clean with an absorbent material. Disinfect surface by wiping clean with a 1:10 dilution of household bleach, then incinerate all absorbent material in heavy-duty rubbish bags.

**Decontamination of blood or body fluid spills**
Spills should be very liberally sprinkled with chloramine granules to absorb the liquid and left for at least 30 minutes. If chloramine powder is not available, absorbent materials may be used to soak up most of the fluid before disinfection with 0.5% liquid bleach. These absorbent materials must then be disinfected in bleach before disposal.

**Sterilization and reuse of instruments and materials**
In a field outbreak situation, it is not advisable to consider sterilization and reuse of any instruments or materials. Sterilization techniques are therefore not required and are not described in this document.

**Disinfection of hands**
The principal means for disinfecting hands is thorough washing with soap and water. If available, commercial hand disinfectants such as chlorhexidine or povidone iodine may be used.
Democratic
Republic of the Congo

1. Health surveillance forms
2. Surveillance system guidelines and alert thresholds
3. Case definitions
4. Guidelines for outbreak control
5. Case management of epidemic-prone diseases
6. Guidelines for collection of specimens for laboratory testing
7. Outbreak investigation kit
## OUTBREAK INVESTIGATION KIT

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Quantity/kit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Basic consumables module</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotton wool, 100%, surgical quality</td>
<td>roll of 500 g</td>
<td>5</td>
</tr>
<tr>
<td>Ballpoint pen</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Pencil</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Eraser</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Felt-tip pen (waterproof)</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Marking pen, water-resistant ink, black and blue</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Notebook (A4, hard cover, squared paper)</td>
<td>series</td>
<td>5</td>
</tr>
<tr>
<td>Ruler</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Calculator</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Scissors</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Thermometer</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Torch light</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Sealing tape</td>
<td>roll</td>
<td>5</td>
</tr>
<tr>
<td>Normal saline (0.9%)</td>
<td>500 ml</td>
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<tr>
<td>Sharps container for disposal of needles and syringes, of about 3 litres capacity</td>
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<td>5</td>
</tr>
<tr>
<td>Chlorine granules, 500 mg/container</td>
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<td>5</td>
</tr>
<tr>
<td><strong>2. Common consumables for collection of all specimens</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gauze swabs, 10 x 10cm, 100% cotton, 12-ply, 17-thread, sterile</td>
<td>100 pcs/box</td>
<td>5</td>
</tr>
<tr>
<td>Disinfecting swabs, impregnated with 70% isopropyl alcohol</td>
<td>100 pcs/box</td>
<td>5</td>
</tr>
<tr>
<td>Microscope slides, 76 x 26 mm, cut edges</td>
<td>50 pcs/box</td>
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</tr>
<tr>
<td>Cover glasses, 22 x 22 mm</td>
<td>1000 pcs/box</td>
<td>5</td>
</tr>
<tr>
<td>Storing box for slides, wooden frame, for 25 slides each</td>
<td>10 boxes/pack</td>
<td>5</td>
</tr>
<tr>
<td>Universal containers, 70 ml, 55 x 44 mm, reliable sealing and polyethylene cap, machine sterile with standard label</td>
<td>1000/pack</td>
<td>5</td>
</tr>
<tr>
<td>Braunoderm (alcohol + PVP-IOD) for surgical scrub, against bacteria, fungi, viruses (incl. hepatitis B and HIV)</td>
<td>1 litre/cont’r</td>
<td>5</td>
</tr>
<tr>
<td>Povidone iodine solution</td>
<td>500-ml/cont’r</td>
<td>5</td>
</tr>
<tr>
<td>Disinfecting solution for hands</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td><strong>3. Blood module</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood lancets, sterile, disposable</td>
<td>pack of 200</td>
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</tr>
<tr>
<td>Monovettes (orange cap, 10 ml)</td>
<td>pack of 100</td>
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<tr>
<td>Monovettes (red cap, EDTA, 3 ml)</td>
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<tr>
<td>Needles for Monovettes 21G</td>
<td>pack of 100</td>
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</tr>
<tr>
<td>Needles for Monovettes 23G</td>
<td>pack of 100</td>
<td>1</td>
</tr>
<tr>
<td>Butterfly needles for blood culture 21G</td>
<td>pack of 100</td>
<td>1</td>
</tr>
<tr>
<td>Disposable soft transfer pipettes</td>
<td>pack of 1000</td>
<td>1</td>
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<tr>
<td>Racks for blood tubes</td>
<td></td>
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</tr>
<tr>
<td>Adhesive tape (small)</td>
<td>pack</td>
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<tr>
<td>Blood culture bottles (Hemoline performance DUO, children)</td>
<td>12 vials/pack</td>
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</tr>
<tr>
<td>Blood culture bottles (Hemoline performance diphasic)</td>
<td>12 vials/pack</td>
<td>5</td>
</tr>
<tr>
<td>Tourniquets with clip</td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>
### 4. Respiratory module
- **Tongue depressor**
- **Flexible wire calcium alginate-tipped swab (for pertussis)**
- **Syringe for suction, 50–60-ml with catheter tip**
- **Transport swabs with TransAmies transport medium**
- **Virus transport medium (Cellmatics)**

### 5. Urine module
- **Urine container with boric acid, with screw cap, 30 ml (sterile)**

### 6. Stool module
- **Rectal swabs for adults**
- **Rectal swabs for infants**
- **Stool collection tubes with spoon**
- **Tubes with Cary-Blair transport medium**

### 7. CSF module
- **Sterile cotton swab**
- **Bottle with Trans-Isolate media**
- **Spinal needle, 25G x 3.5**
- **Spinal needles, 23G x 3.5**
- **Needle for transfer into medium, 21G**
- **Microtube 2.0 ml, with mouth screw cap and skirted base**
- **Local anaesthetics (lidocaine 2% 2 ml), 25G needle, 5-ml syringe**

### 8. Self-protection module
- **Disposable surgical gowns**
- **Disposable surgical face masks**
- **Disposable gloves: sizes S, M, L**
- **Goggles**
- **Face mask**
- **Disposable surgical caps, size M**
- **Rubber surgical boots**
- **Disposable impermeable shoe cover, length 38 cm**
- **Impermeable aprons, 90cm x 112cm**
- **Visors/face-shields**

### 9. Specimen transport module
- **Specimen carrier (cool box),**
- **Icepacks**
- **Microcentrifuge tube rack**
- **Complete combination packaging for infectious substances, BioPack 2 with 1.5-litre BioJar**
- **CL-4 thermal control unit, polystyrene box set in fibreboard case with all labels and instructions**

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Quantity/kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Respiratory module</td>
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<tr>
<td>Tongue depressor</td>
<td>pack of 100</td>
<td>5</td>
</tr>
<tr>
<td>Flexible wire calcium alginate-tipped swab (for pertussis)</td>
<td>pack of 100</td>
<td>1</td>
</tr>
<tr>
<td>Syringe for suction, 50–60-ml with catheter tip</td>
<td>pack of 60</td>
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<tr>
<td>Transport swabs with TransAmies transport medium</td>
<td>pack of 1000</td>
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<tr>
<td>Virus transport medium (Cellmatics)</td>
<td>pack of 50</td>
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<tr>
<td>5. Urine module</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urine container with boric acid, with screw cap, 30 ml (sterile)</td>
<td>400/pack</td>
<td>1</td>
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<tr>
<td>6. Stool module</td>
<td></td>
<td></td>
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<tr>
<td>Rectal swabs for adults</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>Rectal swabs for infants</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>Stool collection tubes with spoon</td>
<td>pack of 400</td>
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</tr>
<tr>
<td>Tubes with Cary-Blair transport medium</td>
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<td>100</td>
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<tr>
<td>7. CSF module</td>
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<tr>
<td>Sterile cotton swab</td>
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<tr>
<td>Bottle with Trans-Isolate media</td>
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<tr>
<td>Spinal needle, 25G x 3.5</td>
<td>25/box</td>
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</tr>
<tr>
<td>Spinal needles, 23G x 3.5</td>
<td>25/box</td>
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</tr>
<tr>
<td>Needle for transfer into medium, 21G</td>
<td>25/box</td>
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<tr>
<td>Microtube 2.0 ml, with mouth screw cap and skirted base</td>
<td>50/bag</td>
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<tr>
<td>Local anaesthetics (lidocaine 2% 2 ml), 25G needle, 5-ml syringe</td>
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<td>100</td>
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<td>8. Self-protection module</td>
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<td></td>
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<tr>
<td>Disposable surgical gowns</td>
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</tr>
<tr>
<td>Disposable surgical face masks</td>
<td>50 pcs/box</td>
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<tr>
<td>Disposable gloves: sizes S, M, L</td>
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<tr>
<td>Goggles</td>
<td></td>
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</tr>
<tr>
<td>Face mask</td>
<td></td>
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</tr>
<tr>
<td>Disposable surgical caps, size M</td>
<td>50 pcs/box</td>
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<tr>
<td>Rubber surgical boots</td>
<td>Pair, size 42</td>
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<tr>
<td>Disposable impermeable shoe cover, length 38 cm</td>
<td>100 pcs/bag</td>
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<tr>
<td>Impermeable aprons, 90cm x 112cm</td>
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<tr>
<td>Visors/face-shields</td>
<td></td>
<td>5</td>
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<tr>
<td>9. Specimen transport module</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specimen carrier (cool box),</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Icepacks</td>
<td>set of 24</td>
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<tr>
<td>Microcentrifuge tube rack</td>
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<tr>
<td>Complete combination packaging for infectious substances, BioPack 2 with 1.5-litre BioJar</td>
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<td>CL-4 thermal control unit, polystyrene box set in fibreboard case with all labels and instructions</td>
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</table>