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
1. SAMPLE WEEKLY MORBIDITY FORM

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

- Count new cases only.
- Count the primary disease/syndrome only.
- If no cases, write 0.

* Report these diseases immediately to your health coordinator or field surveillance officer using CASE-BASED REPORTING FORM.

Alert thresholds for other diseases/syndromes are provided in Annex 2, Surveillance system guidelines and alert thresholds.
2. SAMPLE WEEKLY MORTALITY FORM

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Address</th>
<th>Sex</th>
<th>Age&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Cause of death</th>
<th>Date of death</th>
<th>Place&lt;sup&gt;b&lt;/sup&gt; of death</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

<sup>a</sup> Age in months.
<sup>b</sup> Place – either home (H) or health facility (HF).

For use by data management office:
Form received: __/__/__ Validated □ Entered □ Record number:
## 3. SAMPLE MONTHLY MORBIDITY FORM

<table>
<thead>
<tr>
<th>Province:</th>
<th>District/Section:</th>
<th>Town/Village/Camp:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health facility:</td>
<td>Supporting agency:</td>
<td>Reporting period:  from Monday ……/……/……. to Sunday ……/……/…….</td>
</tr>
<tr>
<td>Catchment population:</td>
<td>Under-5 population:</td>
<td>Name of reporting officer:</td>
</tr>
</tbody>
</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>
<td></td>
<td>&lt;5</td>
<td>≥5</td>
<td>&lt;5</td>
<td>≥5</td>
<td>&lt;5</td>
</tr>
<tr>
<td>Acute diarrhoea</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute watery diarrhoea*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bloody diarrhoea*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VHF* – suspected</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measles*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningitis* – suspected</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AFP* (suspected poliomyelitis)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute jaundice syndrome* (including yellow fever*)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALRI / pneumonia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malaria – suspected</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Neonatal tetanus</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>STIs</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Tuberculosis – suspected</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fever of unknown origin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe malnutrition (W/H &lt;70%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noncommunicable diseases</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</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 Annex 2, Surveillance system guidelines and alert thresholds.

For use by data management office: Form received: ___/___/___ Validated ☐ Entered ☐ Record number:
4. SAMPLE 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 (m/yrs)</th>
<th>Direct causes of death</th>
<th>Underlying causes of death</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fever</td>
<td>Maternal deathb</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bloody diarrhoeaa</td>
<td>Malnutrition</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bloody diarrhoeaa</td>
<td>Other (specify)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cough</td>
<td>Date of deathc</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Specifying cause</td>
<td>Place of deathd</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>or main symptoms</td>
<td>Lab.e</td>
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<td></td>
<td>if unknown</td>
<td></td>
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<td></td>
<td>Unknown</td>
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<td>9</td>
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<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a If this box is ticked, also specify cause in the “specify cause” column. For 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.

b See list of “Case definitions” in Annex 3
c Record in the form dd/mm/yy.
d HF = health facility, C = community.
e S = sample taken, C = confirmed.

For use by data management office: Form received: __/__/____ Validated □ Entered □ Record number: ____
# 5. SAMPLE OUTBREAK ALERT FORM

<table>
<thead>
<tr>
<th>District: ..........................</th>
<th>Province: ..........................</th>
</tr>
</thead>
<tbody>
<tr>
<td>Town/Village/Camp: ..........</td>
<td>Health facility: ..........................</td>
</tr>
<tr>
<td>Supporting agency: ..........................</td>
<td>Date: <strong>/</strong>/__ Name of reporting officer: ..........................</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>
</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. SAMPLE OUTBREAK INVESTIGATION FORM

<table>
<thead>
<tr>
<th>District: .................................................</th>
<th>Province: ................................................</th>
</tr>
</thead>
<tbody>
<tr>
<td>Town/Village/Camp: .......................................</td>
<td>Health facility: ................................................</td>
</tr>
<tr>
<td>Supporting agency: ................................................</td>
<td>................................................</td>
</tr>
</tbody>
</table>

Date: __/__/__  Name of reporting officer: ____________________________

## 1. PATIENT IDENTIFICATION

<table>
<thead>
<tr>
<th>Case no:</th>
<th>Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Location in village or site: __________________________________________

Date of birth: __/__/__  Age: ______  Sex: M F

## 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: <strong>/</strong>/__</th>
<th>Lab. received: <strong>/</strong>/__</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Name of laboratory: __________________________________________

Type of test: _______  Date of results: __/__/__  Result: Pos. Neg.

## 4. FINAL CLASSIFICATION

Confirmed: [ ] Laboratory  Date of final diagnosis: __/__/__

[ ] Clinical case  Discarded final diagnosis: ____________________________

## 5. FIELD INVESTIGATOR

Name: ____________________________

Position: ____________________________  Signature: ____________________________

*Note: One form per case investigated.*
ANNEX

Niger

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

Examples of suitable health surveillance forms for use in Niger are provided in Annex 1. Included are: weekly morbidity form, weekly mortality form, monthly morbidity form, monthly mortality form, outbreak alert form and case investigation form. They aim to provide early warning of outbreaks of the following major communicable diseases:

- bacillary dysentery
- cholera
- malaria
- measles
- meningococcal meningitis
- poliomyelitis
- typhoid fever
- yellow fever.

In addition to these outbreak-prone diseases, the main health problems are likely to be:

- endemic malaria
- acute lower respiratory tract infection/pneumonia
- malnutrition.

REPORTING MECHANISMS

A daily register of consultations should be kept in each health facility. The following is a suggested layout for the register:

<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 Provincial Medical Officer. One person should be responsible for compiling the data from the daily register for the Weekly Morbidity Report.

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

HOW TO FILL IN THE MONTHLY MORBIDITY FORM

- 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 should be included.
- All cases attending the health facility should be recorded on the Monthly Morbidity Report, including those who are subsequently referred to hospital.
- Only the first consultation 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 main cause for consultation, i.e. one disease/syndrome for each case, should be selected for reporting.
- If one of the diseases has epidemic potential (marked with an asterisk on the form), this disease should be recorded as the main cause of consultation.
Communicable disease toolkit for NIGER: Surveillance system guidelines and alert thresholds

- include all cases of communicable diseases not mentioned in the list, e.g. skin infections.
- "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. These diseases must be reported to the District Surveillance Officer or Provincial Medical Officer using the outbreak alert form if the weekly alert thresholds are passed (see below).
- Other diseases/syndromes must be alerted to the health coordinator or supervisor if the weekly alert thresholds, specified in the box below, 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.
- For each case, all the required details – including names, age, sex, date and location of death and laboratory sample taken – should be filled in and a main cause of death recorded (even if "unknown").

Mortality rates can be calculated as follows:

**Crude mortality rate (CMR):**

\[
\text{CMR} = \left( \frac{\text{total no. of deaths for the month}}{\text{total population at the end of the month}} \right) \times 1000
\]

**Under-5 mortality rate (U5MR):**

\[
\text{U5MR} = \left( \frac{\text{no. of deaths among children aged <5 years for the month}}{\text{under 5-year population at the end of the month}} \right) \times 1000
\]

Alert thresholds for mortality are shown in the box. If one of these thresholds is reached in a week, the Outbreak Alert Form should be used to report to the District Surveillance Officer and Provincial Medical Officer.
<table>
<thead>
<tr>
<th>Disease/Syndrome</th>
<th>Alert Thresholds Per Week</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>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>Severe malnutrition:</td>
<td>3 cases</td>
</tr>
</tbody>
</table>

CMR: >1/10 000/day (i.e. >2.8/1000/month)
U5MR: >2/10 000/day (i.e. >5.6/1000/month)

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

Niger

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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 cholerae* 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 from 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 under 1 year of age, 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.

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 postmortem 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 LESS THAN 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, lethargy or unconsciousness) 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, or in accordance with current Niger National Tuberculosis Control Programme recommendation).

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)
or
─ one sputum smear specimen positive for AFB and radiographic abnormalities consistent with active pulmonary TB
or
─ 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
and
─ radiographic abnormalities consistent with active pulmonary TB
and
─ no response to a course of broad-spectrum antibiotics
and
─ 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 ≥38 °C for 3 or more days is considered suspect if the epidemiological context is conducive.

Clinical diagnosis is difficult as typhoid 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 (65–110 cm in height):
— weight-for-height (W/H) index $<-3$ Z-scores (less than $-3$ 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 which may be:
— war-related: caused by 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 a liveborn infant during the first 28 days of life. It is a classification by age, not cause.
Niger

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
Table 1
Steps in management of an outbreak

1. PREPARATION
   - Health coordination meetings.
   - Surveillance system: weekly epidemic-prone disease reports to Ministry of Health and WHO.
   - Stockpiles: sampling kits, appropriate antibiotics, intravenous fluids.
   - Contingency plans for isolation wards in hospitals.
   - Laboratory support.

2. DETECTION
   - Diseases of outbreak potential are marked with an asterisk (*) on the Weekly Morbidity Form. They must be reported as soon as possible to the district medical officer (DMO) or district surveillance officer or health coordinator using the Outbreak Alert Form if the weekly alert thresholds (See Annex 2, “Guidelines for use of surveillance forms”) are passed. The health coordinator should inform the Ministry of Health and WHO.
   - A clinical specimen (e.g. stool, serum, cerebrospinal fluid) must be taken for laboratory confirmation. The case must be included in the Weekly Morbidity Form.

3. RESPONSE
   Confirmation
   - The lead health agency will investigate reported cases to confirm the outbreak situation. Clinical specimens will be sent for testing.
   - The lead health agency will set up an outbreak control team with members drawn from relevant organizations: Ministry of Health, WHO and other United Nations organizations, nongovernmental organizations in the fields of health and water and sanitation, veterinary experts.

   Investigation
   - 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 as recommended in WHO guidelines.
   - Prevent exposure (e.g. isolation of cases in cholera outbreak).
   - Prevent infection (e.g. immunization in measles outbreak).

4. EVALUATION
   - Assess timeliness of outbreak detection and response.
   - Change public health policy if indicated (e.g. preparedness).
   - Write and disseminate outbreak report.
Table 2

**Resources needed for outbreak response**

- Personnel (trained staff)
- Supplies (e.g. oral rehydration salts, intravenous fluids, water containers, water-purifying tablets, drinking cups, vaccines, vitamin A, monitoring forms, vaccination cards, tally sheets)
- Treatment facilities (location, beds available, stocks of basic medical supplies)
- Laboratory facilities (location, capacity, stocks of reagents, etc.)
- Transport (sources of emergency transport and fuel, cold chain)
- Communication links (between health centres; between Ministry of Health, nongovernmental organizations and United Nations agencies)
- Computers (not essential)
- In an outbreak requiring an immunization campaign:
  - safe injection equipment (e.g. auto-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</th>
<th>Risk Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute respiratory infections</td>
<td>Inadequate shelter with poor ventilation</td>
</tr>
<tr>
<td></td>
<td>Indoor cooking, poor health-care services</td>
</tr>
<tr>
<td></td>
<td>Malnutrition, overcrowding</td>
</tr>
<tr>
<td></td>
<td>Age under 1 year</td>
</tr>
<tr>
<td></td>
<td>Large numbers of elderly people</td>
</tr>
<tr>
<td></td>
<td>Cold weather</td>
</tr>
<tr>
<td>Diarrhoeal diseases</td>
<td>Overcrowding</td>
</tr>
<tr>
<td></td>
<td>Inadequate quantity and/or quality of water</td>
</tr>
<tr>
<td></td>
<td>Poor personal hygiene</td>
</tr>
<tr>
<td></td>
<td>Poor washing facilities</td>
</tr>
<tr>
<td></td>
<td>Poor sanitation</td>
</tr>
<tr>
<td></td>
<td>Insufficient soap</td>
</tr>
<tr>
<td></td>
<td>Inadequate cooking facilities</td>
</tr>
<tr>
<td>Malaria</td>
<td>Movement of people from endemic into malaria-free zones or from areas of low endemicity to hyperendemic areas</td>
</tr>
<tr>
<td></td>
<td>Increased population density promoting mosquito bites</td>
</tr>
<tr>
<td></td>
<td>Interruption of vector control measures</td>
</tr>
<tr>
<td></td>
<td>Inadequate health-care services</td>
</tr>
<tr>
<td></td>
<td>Stagnant water</td>
</tr>
<tr>
<td></td>
<td>Flooding, changes in weather patterns</td>
</tr>
<tr>
<td>Measles</td>
<td>Measles immunization coverage rates below 80%</td>
</tr>
<tr>
<td></td>
<td>Population movement</td>
</tr>
<tr>
<td></td>
<td>Overcrowding</td>
</tr>
<tr>
<td>Meningococcal meningitis</td>
<td>Meningitis belt</td>
</tr>
<tr>
<td></td>
<td>Dry season</td>
</tr>
<tr>
<td></td>
<td>Dust storms</td>
</tr>
<tr>
<td></td>
<td>Overcrowding</td>
</tr>
<tr>
<td></td>
<td>High rates of acute respiratory infections</td>
</tr>
<tr>
<td>Viral haemorrhagic fever (VHF)</td>
<td>Lack of hygiene, poor sanitation, contact with objects/food contaminated with rodent excreta; unsafe food handling and storage practices</td>
</tr>
<tr>
<td></td>
<td>Population displacement with subsequent overcrowding</td>
</tr>
<tr>
<td></td>
<td>Poor access to health services, poor isolation and protection measures (barrier nursing)</td>
</tr>
<tr>
<td></td>
<td>Tick-infested areas (Crimean–Congo haemorrhagic fever)</td>
</tr>
<tr>
<td></td>
<td>Handling or eating ill or dead infected chimpanzees (Ebola)</td>
</tr>
<tr>
<td>Yellow fever</td>
<td>Unvaccinated people moving to areas of endemicity are at risk</td>
</tr>
<tr>
<td></td>
<td>Overcrowding</td>
</tr>
<tr>
<td></td>
<td>Open water storage provides favorable habitat for <em>Aedes aegypti</em></td>
</tr>
<tr>
<td></td>
<td>Old tyres, old water containers increase vector breeding</td>
</tr>
<tr>
<td></td>
<td>Poor drainage (leading to pools and open channels of water) may increase vector breeding opportunities.</td>
</tr>
</tbody>
</table>
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
- Hospitalization unit: reserved for severe patient 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>
<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, only one carer per patient</td>
</tr>
<tr>
<td></td>
<td>One-way flow of people</td>
<td>three separate spaces within unit (see Figure 1)</td>
</tr>
<tr>
<td>Water</td>
<td>Safe water (chlorine concentration according to specific use; see Table 5)</td>
<td>Ideally 50 litres water per patient per day</td>
</tr>
<tr>
<td></td>
<td>Large quantity needed (minimum 10 litres per person per 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:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o before and after taking care of patients</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o after using the latrines</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o before cooking or eating</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o 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 “tempting” and may lead to security problems</td>
</tr>
<tr>
<td>Clothes</td>
<td>Wash clothes and linen with the appropriate chlorine solution (see Table 5)</td>
<td>If no chlorine is available, wash clothes with soap and dry them in the sun</td>
</tr>
<tr>
<td>Environmental</td>
<td>Ensure exclusive latrines for the unit</td>
<td>Latrines at least 100 metres away from wells or surface-water sources</td>
</tr>
<tr>
<td>contamination</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>(faeces and waste)</td>
<td>Incinerator for medical waste</td>
<td></td>
</tr>
<tr>
<td>Corpses</td>
<td>Separate morgue</td>
<td>Find ways of ensuring 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>

*a Developed by the WHO Global Task Force on Cholera Control.*
Table 5
Preparation and use of disinfectants^a

<table>
<thead>
<tr>
<th>Starting with</th>
<th>To obtain:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2% solution</td>
</tr>
<tr>
<td></td>
<td>0.2% solution</td>
</tr>
<tr>
<td></td>
<td>0.05% solution</td>
</tr>
<tr>
<td>Calcium hypochlorite at 70% active chlorine</td>
<td>30 g/litre or 2 tablespoons/litre</td>
</tr>
<tr>
<td>(&quot;high-test hypochlorite&quot; – HTH)</td>
<td></td>
</tr>
<tr>
<td>Chlorinated lime at 30% active chlorine</td>
<td>66 g/litre or 4 tablespoons/litre</td>
</tr>
<tr>
<td>(&quot;bleaching powder&quot;)</td>
<td></td>
</tr>
<tr>
<td>Sodium hypochlorite solution at 6% active chlorine</td>
<td>333 ml/litre or 22 tablespoons/litre</td>
</tr>
<tr>
<td>(&quot;household bleach&quot;)</td>
<td></td>
</tr>
<tr>
<td>Use for disinfection of</td>
<td>Excreta</td>
</tr>
<tr>
<td></td>
<td>Corpses</td>
</tr>
<tr>
<td></td>
<td>Shoes</td>
</tr>
<tr>
<td></td>
<td>Floor</td>
</tr>
<tr>
<td></td>
<td>Utensils</td>
</tr>
<tr>
<td></td>
<td>Beds</td>
</tr>
<tr>
<td></td>
<td>Hands</td>
</tr>
<tr>
<td></td>
<td>Skin</td>
</tr>
<tr>
<td></td>
<td>Clothes</td>
</tr>
</tbody>
</table>

^a 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.
HOW TO ESTIMATE THE INITIAL AMOUNT OF SUPPLIES NEEDED FOR A CHOLERA OUTBREAK

Of the population, 0.2% is expected to fall ill initially. Table 6 below gives an estimate of the supplies needed according to the number of people in the affected area. To find the amounts needed for each item, look in the column that gives the approximate population of your catchment area to the nearest 5000. Several columns may be added together if necessary: for example, 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 6
Cholera treatment supplies per population

<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>5 000 (10)</td>
<td>10 000 (20)</td>
</tr>
<tr>
<td>Rehydration supplies</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>Antibiotics</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>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>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>½</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.
HOW TO ESTIMATE THE AMOUNT OF SUPPLIES NEEDED FOR A DYSENTERY OUTBREAK

Of the population, 0.2% is expected to fall ill initially. Table 7 below gives an estimate of the supplies needed according to the number of people in the affected area. To find the amounts needed for each item, look in the column that gives the approximate population of your catchment area to the nearest 5000. Several columns may be added together: for example, 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 recommended antibiotics (See: First steps in managing an outbreak of acute diarrhoea. Geneva, WHO, 2004 (WHO/CDS/CSR/ NCS/2003.7 Rev.1.).)

Table 7
Dysentery treatment supplies per population

<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 (10)</td>
<td>10 000 (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, 500 mg</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>½</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>

a Developed by the WHO Global Task Force on Cholera Control.
HOW TO ESTIMATE THE AMOUNT OF SUPPLIES NEEDED FOR A TYPHOID OUTBREAK

Of the population, 0.2% is expected to fall ill initially. Table 8 below gives an estimate of the supplies needed according to the number of people in affected area. To find the amounts needed for each item, look in the column that gives the approximate population of your catchment area to the nearest 5000. Several columns may be added together: for example, 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 8
Typhoid fever treatment supplies per population\(^a\)

<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>5 000 (10)</td>
<td>10 000 (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,(^b) 1 litre, with giving sets</td>
<td>1</td>
<td>2</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>Chloramphenicol, 250 mg</td>
<td>2 500</td>
<td>5 000</td>
</tr>
<tr>
<td>Amoxicillin, 500 mg</td>
<td>1 680</td>
<td>3 360</td>
</tr>
<tr>
<td>Co-trimoxazole (SMX 400 mg + TMP 80 mg)</td>
<td>840</td>
<td>1 680</td>
</tr>
<tr>
<td>Cefixime, 200 mg(^c)</td>
<td>840</td>
<td>1 680</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>½</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>Box 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>

\(^a\) Developed by the WHO Global Task Force on Cholera Control.
\(^b\) Less than 50% of patients need IV rehydration.
\(^c\) In case of multidrug resistance to the above antibiotics, choose cefixime.
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 of a VHF outbreak investigation.
COMMUNICABLE DISEASE TOOLKIT FOR NIGER: GUIDELINES FOR OUTBREAK CONTROL

VIRAL HAEMORRHAGIC FEVER OUTBREAK CONTROL

Health workers should be aware of the possibility of a VHF in a non-outbreak situation. As soon as a VHF is suspected, appropriate isolation precautions should begin, which 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;
  - 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 the patient’s being 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:
Isolation precautions 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.\(^1\)
- Clean and disinfect soiled linens and laundry safely.\(^1\)
- Use safe disposal methods for non-reusable supplies and infectious waste.
- Provide information about the risk of VHF transmission to all 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.

See Appendix A, 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) for the following information:
- place where the patient is currently living;
- other persons with the same symptoms in the family or village;
- place(s) the patient has visited in the past 3 weeks.

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

---

\(^1\) Wash and soak reusable equipment in 0.5% chlorine solution. (See Annex 7, Guidelines for collection of specimens for laboratory testing.)
Specimens for laboratory confirmation:
For confirmation of diagnosis, obtain specimens according to the VHF that is suspected. See Annex 6 of this Toolkit, Guidelines for collection of specimens for laboratory testing, for specific techniques for collecting blood and other specimens from suspected VHF cases and for methods 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, for transport/shipping of the specimens to a WHO-recommended reference laboratory and for follow-up of results.

Alert health-facility staff about specific risks for VHF transmission:
As soon as a VHF is suspected, alert the relevant health staff to 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 handle samples from the suspected VHF cases;
– medical or support staff who 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 all VHF diseases are highly infectious. Emphasize – and ensure – the use of VHF isolation precautions whenever staff have contact with the VHF patient, the patient’s blood or other body fluids, or contaminated supplies and equipment.
Appendix A

The isolation area

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

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

**Important!** There should be an isolated toilet, adequate ventilation and screened windows (see Figure 3 below). Place a security barrier around, 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 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 masks;
- how to take off gloves, gowns and masks and dispose of them safely.
Figure 3  
**Example of a viral haemorrhagic fever treatment isolation area**

Sample layout of a facility for several viral haemorrhagic fever patients
Appendix B

Safe burial practices

The bodies and body fluids of deceased VHF patients remain infectious for several days after death. Family and community members are thus at risk if burial practices involve touching (e.g. 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, and help the family to understand why some practices cannot be observed because they place the family and others at risk of 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 member who disinfects the vehicle must wear protective clothing.
- Rinse the interior of the vehicle where the body was carried with a 0.5% chlorine solution.¹ Let chlorine solution soak in the interior of the vehicle for 10 minutes
- Rinse well with clean water and let the vehicle air-dry.

¹ See Annex 6: Guidelines for collection of specimens for laboratory testing in this Toolkit.
ANNE
EX

Niger

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
CONTENTS

1. BACILLARY DYSENTERY (SHIGELLOSIS) .................................................................3
2. CHOLERA ........................................................................................................5
3. TYPHOID FEVER ...........................................................................................7
4. MEASLES .......................................................................................................9
5. MENINGITIS ..................................................................................................12
6. YELLOW FEVER ............................................................................................14

APPENDIX 1: ASSESSMENT AND TREATMENT OF DIARRHOEA ......................17
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 under 10 years of age.
- 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 unsafe food and water.
- Highly contagious: as few as 10–100 bacteria have caused disease in volunteers.
- Treatment is with antibiotics, 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 must be kept at a temperature of 4 °C; samples must reach the laboratory within 12 hours of being collected. If fresh stool samples are not refrigerated, they must reach the laboratory for culture within 2 hours.
- Where transport to the laboratory will take longer, Cary-Blair transport medium 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* type 1 (Sd1) from stool samples.

Table 1

<table>
<thead>
<tr>
<th>High-risk 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

- Rehydrate with ORS or IV solution depending on severity, and monitor the hydration status frequently. (See Appendix A for assessment and treatment of diarrhoea and dehydration.)
- Refer seriously ill or severely malnourished patients to hospital immediately.

B. Give antibiotics

- Antibiotics (see Table 2) are essential and should be selected on the basis of susceptibility testing of the organisms grown from patients affected by the disease. The antibiotic used must be effective against the local Sd1 strains.
- If an antibiotic 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.

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Dosage</th>
<th>Children</th>
<th>Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;1 year</td>
<td>1–5 years</td>
<td>5–15 years</td>
</tr>
<tr>
<td>Ciprofloxacin, 500 mg</td>
<td>30 mg/kg divided 2 times/day 3 days</td>
<td>¼ tablet 2 times/day 3 days</td>
<td>½ tablet 2 times/day 3 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Do not give antibiotics known to be ineffective. When the supply of an effective antibiotics 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 4 of this Toolkit, Guidelines for outbreak control, 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 cholerae*, 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 to be 1–2%.
- Case-fatality rate (CFR) is usually around 5% but has 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 and to 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 over 5 years of age develops severe dehydration from acute watery diarrhoea (usually with vomiting), or
- any patient over 2 years of age has acute watery diarrhoea in an area where there is an outbreak of cholera.

Laboratory 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 medium.
- Medium 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 of cholera management:

Step 1 Assess for dehydration (see Appendix A).
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
  - continue breastfeeding of infants and young children.
Standard treatment regimens

A. Rehydrate

- Rehydrate with ORS or IV solution depending on severity, and monitor the hydration status frequently (see Appendix A 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

- **Antibiotic therapy is not essential** to the management of cholera. **Effective rehydration therapy is life-saving.** In emergencies, systematic administration of antibiotics 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 with respect to case management capacity.
- An antibiotic susceptibility profile of the outbreak strain must be available as soon as possible to guide the choice of antibiotic. Only oral antibiotics (see Table 3) must be given, and only after the patient has been rehydrated (usually in 4–6 hours) and vomiting has stopped.

Table 3

<table>
<thead>
<tr>
<th>Antibiotic</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>30 mg/kg divided 4 times/day 3 days</td>
<td>¼ tablet</td>
<td>½ tablet</td>
<td>1 tablet</td>
<td>2 tablets</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>300 mg</td>
<td>single dose 4 times/day 3 days</td>
<td>3 tablets</td>
<td>3 tablets</td>
<td>3 days</td>
<td>3 days</td>
</tr>
</tbody>
</table>

Do not forget:

- In health facilities:
  - strengthen sanitary and hygiene measures in general; implement disinfection measures in cholera wards;
  - implement special funeral practices;
  - disinfect corpses with chlorine solution (2%);
  - fill the mouth and anus of each corpse with cotton wool soaked with 2% chlorine solution;
  - wash hands with soap after touching the corpse;
  - disinfect the clothing and bedding of the deceased patient 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 in containing the spread of cholera.

See Annex 4 of this Toolkit, *Guidelines for outbreak control*, 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).
- Of infected cases, 2–5% 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 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
- Rehydrate with ORS or IV solution depending on severity.

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. Use only one of the antibiotics given in Table 4.
Communicable disease toolkit for NIGER: Case management of epidemic-prone diseases.

Table 4
Antibiotics effective for typhoid fever

<table>
<thead>
<tr>
<th>Susceptibility of infecting organism</th>
<th>Antibiotic</th>
<th>Daily dose</th>
<th>Number of treatment days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fully susceptible</td>
<td>Chloramphenicol</td>
<td>50–75 mg</td>
<td>14–21</td>
</tr>
<tr>
<td></td>
<td>Amoxicillin</td>
<td>75 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 antiarrhythmic 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
  - ensure use of safe 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 4 of this Toolkit, *Guidelines for outbreak control*, 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).
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 those caused by the 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 immunization 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 of age 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 day 3–7, 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 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, caused by Gram-negative bacteria or pneumococcus.
- Diarrhoea: either due to virus or from a secondary infection, e.g. *Shigella*.
- Malnutrition: precipitated by anorexia, stomatitis, fever, vomiting, diarrhoea and other complications.
- Stomatitis: compromises 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 day 5 of the rash.
- Otitis media.
- 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</td>
</tr>
<tr>
<td></td>
<td>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 children in shaded and well-ventilated areas, which are generally more comfortable for them; sunlight can be painful to their eyes and a cool environment can keep body temperature down.

Control fever by tepid sponging and administration of paracetamol.

Keep the patient well hydrated: treat diarrhoea with ORS.

Observe closely for complications.

Give prophylaxis against xerophthalmia: vitamin A on day 1 and day 2 as follows:

<table>
<thead>
<tr>
<th>Age</th>
<th>Vitamin A dose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Day 1</td>
</tr>
<tr>
<td>Infants &lt;6 months</td>
<td>50 000 IU</td>
</tr>
<tr>
<td>Infants 6–11 months</td>
<td>100 000 IU</td>
</tr>
<tr>
<td>Children &gt;11 months</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 that 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 antibiotics 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 antibiotics should be given to children at significant risk of secondary bacterial infection, such as children with severe malnutrition, HIV infection or xerophthalmia. A broad-spectrum antibiotic such as ampicillin or co-trimoxazole should be used.
- Pneumonia – cough and rapid breathing (40 breaths/minute or more in children over 1 year of age; 50 breaths/minute in children under 1 year); give an antibiotic such as ampicillin or amoxicillin 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 whether 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)*, above, 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 of vitamin A 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 W135).
- *N. meningitidis* also causes meningococcal septicaemia – a less common but severe, highly fatal disease with acute fever, purpura and shock.
- *N. meningitidis*, *Streptococcus pneumoniae* and *Haemophilus influenzae* 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 Coxsackie 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. meningitidis*, serogroup A.
- 80% of cases of meningococcal meningitis occur in those under 30 years of age.
- 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 and 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 a 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 estimation and Gram stain.

**Bacterial (meningococcal) meningitis if:**
- WCC: >1000 cells/mm³ (<3 in normal CSF) with >60% polymorphs
- Protein: >0.80 g/litre (<0.60 g/litre in normal CSF)
- Gram stain: Gram-negative diplococci in 80% of cases not previously treated.

Differential diagnosis of bacterial meningitis
Viral meningitis: do lumbar puncture 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 (see Table 5) without waiting for results.
- Do not delay treatment with antimicrobials if lumbar puncture cannot be done.
• IV administration of benzylpenicillin, ampicillin, ceftriaxone or cefotaxime is recommended for bacterial meningitis; however ceftriaxone and 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 5
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>Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>In epidemic situations: all age groups</td>
<td>N. meningitidis</td>
<td>Oily chloramphenicol</td>
<td>Ampicillin; ceftriaxone or cefotaxime; co-trimoxazole; benzylpenicillin</td>
</tr>
<tr>
<td>In non-epidemic situations:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>adults</td>
<td>N. meningitidis</td>
<td>Benzylpenicillin or oily chloramphenicol</td>
<td>Ampicillin; ceftriaxone or cefotaxime; co-trimoxazole</td>
</tr>
<tr>
<td>children aged &gt;5 years</td>
<td>S. pneumoniae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>children 1 month–5 years</td>
<td>H. influenzae</td>
<td>Ampicillin or amoxicillin chloramphenicol</td>
<td>Ceftriaxone or cefotaxime</td>
</tr>
<tr>
<td>neonates</td>
<td>S. pneumoniae</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N. meningitidis</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gram-negative bacteria</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Group B streptococci</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Listeria</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Amoxicillin and gentamicin</td>
<td>Ceftriaxone or cefotaxime; chloramphenicol</td>
</tr>
</tbody>
</table>

Table 6
Antimicrobials to treat bacterial meningitis

<table>
<thead>
<tr>
<th>Agent</th>
<th>Route</th>
<th>Daily dose</th>
<th>Duration (days)</th>
<th>Cost*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzylpenicillin</td>
<td>IV</td>
<td>3–4 million units four/six times</td>
<td>400 000 U/kg</td>
<td>&gt;4</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>
</tr>
<tr>
<td>Amoxicillin</td>
<td>Oral</td>
<td>2–3 g twice</td>
<td>250 mg/kg</td>
<td>&gt;4</td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>IV</td>
<td>1g twice/three times</td>
<td>100 mg/kg</td>
<td>&gt;4</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>
</tr>
<tr>
<td>Cefotaxime</td>
<td>IV</td>
<td>2 g twice</td>
<td>250 mg/kg</td>
<td>&gt;4</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>
</tr>
<tr>
<td>Co-trimoxazole</td>
<td>IV/IM</td>
<td>2 g SMZ² twice</td>
<td>100 mg/kg</td>
<td>&gt;4</td>
</tr>
<tr>
<td>Co-trimoxazole</td>
<td>Oral</td>
<td>2 g SMZ² twice</td>
<td>100 mg/kg</td>
<td>&gt;4</td>
</tr>
</tbody>
</table>
Sulfadiazine | IV | 1 g six times | 200 mg/kg | >4 | low

*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.
- 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 or nose or blood 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 ORS 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 antibiotics recommended for your area.
**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:
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- For restlessness: give diazepam.
- For malaria: give an antimalarial recommended for your area.
- For bacterial infections: give antibiotics recommended for your area.
### 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></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General condition</td>
<td>Well, alert</td>
<td>Restless*, irritable*</td>
<td>Lethargic or unconscious*; floppy*</td>
</tr>
<tr>
<td>Eyes&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Normal</td>
<td>Sunken</td>
<td>Very sunken and dry</td>
</tr>
<tr>
<td>Tears</td>
<td>Present</td>
<td>Absent</td>
<td>Absent</td>
</tr>
<tr>
<td>Mouth and tongue&lt;sup&gt;c&lt;/sup&gt;</td>
<td>Moist</td>
<td>Dry</td>
<td>Very dry</td>
</tr>
<tr>
<td>Thirst</td>
<td>Drinks normally, not thirsty</td>
<td>Thirsty*, drinks eagerly*</td>
<td>Drinks poorly* or not able to drink*</td>
</tr>
<tr>
<td><strong>2. Feel:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skin pinch&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Goes back quickly</td>
<td>Goes back slowly*</td>
<td>Goes back very slowly*</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 sign,* there is some dehydration</td>
<td>If the patient has two or more signs, including at least one sign,* 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>

---


<sup>b</sup> 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.

<sup>c</sup> 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.

<sup>d</sup> 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 less than 6 months and not yet taking solid food, give ORS solution or water rather than food-based fluid.
   - Give as much of these fluids as the child will take. Use the amounts shown below for ORS as a guide.
   - Continue giving these fluids until the diarrhoea stops.
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 more 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.**
Describe and show the amount to be given after each stool, using a local measure.

<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 (¼ – ½ cup)</td>
<td>500 ml/day</td>
</tr>
<tr>
<td>2–10 years</td>
<td>100–200 ml (¼ – 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>

**Show the mother how to mix and to give ORS**
   - Give a teaspoonful every 1–2 minutes for a child aged less than 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>Agea</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>ORS 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>

a 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) x 0.075.

- If the child wants more ORS than shown, give more.
- Encourage the mother to continue breastfeeding.
- For infants aged less than 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 to the child.
- Show her how to give it – a teaspoonful every 1–2 minutes for a child aged less than 2 years, frequent sips from a cup for an older child.
- Check from time to time to see whether 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></th>
<th>First give</th>
<th>Then give</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants (&lt;12 months)</td>
<td>30 ml/kg in: 1 hour*</td>
<td>70 ml/kg in: 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 per 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.
Niger

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 minimize 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 Annex 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 Niger or its neighbouring countries. It is adapted for emergency situations from the *Guidelines for the collection of clinical specimens during field investigation of outbreaks* (Geneva, WHO, 2000 (WHO/CDS/CSR/EDC/2000.4)).
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.

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. 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.

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.

Laboratory for specimen testing

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

Collecting the specimens

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

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.

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 forms and should be used as a common reference.

Labelling specimen containers/slides

Labels must always be used. The label should be permanently affixed to the specimen container. It should include:
- patient's name;
- unique identification number;
- specimen type and date and place of collection;
- name or initials of specimen collector.

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 with laboratory specimen 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 immunization 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.

**STORAGE OF SPECIMENS**

To preserve bacterial or viral viability for microbiological culture or inoculation, specimens should be placed in appropriate media and stored at recommended temperatures. These conditions must be preserved throughout transportation to the laboratory and will vary according to the nature of the specimens and the 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. Freezing of specimens must be done 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 is advisable except in the case of particularly cold-sensitive organisms such as *Shigella*, the meningococcus, and the 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 Niger

<table>
<thead>
<tr>
<th>Suspected organism/disease (and type of specimen collected taken)</th>
<th>Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Vibrio cholerae</em> (O1): (stool)</td>
<td></td>
</tr>
<tr>
<td><em>Shigella dysenteriae</em> type 1: (stool)</td>
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</tr>
<tr>
<td>Meningitis: cerebrospinal fluid (CSF)</td>
<td></td>
</tr>
<tr>
<td>– Gram-stain at peripheral laboratories (health centres and district hospitals)</td>
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<tr>
<td>– Rapid tests (latex agglutination) with slidex meningite Kit 5 for meningococcus available with some NGOs in Niger (e.g. MSF)</td>
<td></td>
</tr>
<tr>
<td>– Transport for culture to Institut Pasteur (IP) Paris, France, OSLO Laboratory or NHLS of South Africa</td>
<td></td>
</tr>
<tr>
<td>Measles: blood, serum (2 tubes)</td>
<td>Hôpital National / CERMES</td>
</tr>
<tr>
<td></td>
<td>BP 13 378 Niamey ou</td>
</tr>
<tr>
<td></td>
<td>BP 10 887 Niamey</td>
</tr>
<tr>
<td></td>
<td>Niger</td>
</tr>
<tr>
<td>Yellow fever: blood, serum (2 tubes)</td>
<td>Institut Pasteur (IP), Dakar, Senegal, for confirmation</td>
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<tr>
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<td>B.P. 220</td>
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<tr>
<td></td>
<td>36 Avenue de Pasteur</td>
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<tr>
<td></td>
<td>Dakar</td>
</tr>
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<td></td>
<td>Senegal</td>
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<tr>
<td>Haemorrhagic fevers: (blood, saliva, urine)</td>
<td>Special Pathogens Program, National Microbiology Laboratory, 1015 Arlington Street, Winnipeg, MB, R3E 3R2, Canada</td>
</tr>
<tr>
<td></td>
<td>Special Pathogens Unit, National Institute for Communicable Diseases Private Bag X4, Sandringham 2131, South Africa</td>
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<tr>
<td></td>
<td>CDC NCID/SPB, 1600 Clifton Road, Atlanta, GA 30333, USA</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 haemorrhagic fevers is described in Annex 4 of this Toolkit, *Guidelines for outbreak control*.

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 fevers such as Marburg or Ebola (see Appendix 1 in communicable disease profile of this toolkit).
- Place a tourniquet above the venepuncture site. Disinfect the tops of blood culture bottles.
- Palpate and locate the vein. Disinfect the venepuncture site meticulously disinfected with 10% povidone iodine or 70% alcohol (isopropyl alcohol, ethanol) by swabbing the skin concentrically from the centre of the venepuncture 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 system, withdraw the desired amount of blood directly into each transport tube and culture bottle.
- If using a vacuum system, withdraw the desired amount of blood directly into each transport tube and culture bottle.
- Remove the tourniquet. Apply pressure to site until bleeding stops, then 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

A CSF 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
- if available, Trans-Isolate® media (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 it 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 stored 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 diarrhoeal pathogens. Rectal swabs showing faeces may also be taken from infants but are not useful for the diagnosis of viral infections.

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 is 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 etiological agent may be isolated on blood culture.

**Materials for collection**

- Transport media – bacterial (TransAmies®) 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. Alternatively, 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 the 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.
- Repeat on the other side.
- Complete the laboratory request form.

**Lower respiratory tract specimens**

**Method of collecting sputum**

- Instruct the 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.
- Ensure that the laboratory request form is completed.

**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 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 people.

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 the case of VHFs. 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 the specimens collected and the laboratory request forms should bear the patient’s 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 should also 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 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 is critical to prevent external contamination of specimen containers during specimen collection.

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 identify or describe the specimen and also identify 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 the section Labelling specimen containers/slides 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 7, *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 of 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 of disinfecting hands is thorough washing with soap and water. If available, commercial hand disinfectants such as chlorohexidine (gluconate) or povidone iodine may be used.
ANNEX

Niger

1. Health surveillance forms
2. Surveillance system guidelines and alert thresholds
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## OUTBREAK INVESTIGATION KIT

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<th>Item</th>
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<tbody>
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</tr>
<tr>
<td>Scissors</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Thermometer</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Torch/flashlight</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>
<td>5</td>
</tr>
<tr>
<td>Sharps container for disposal of needles and syringes, of about 3 litres capacity</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Chlorine granules, 500 mg/container</td>
<td></td>
<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 10 cm, 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>
<td>5</td>
</tr>
<tr>
<td>Cover glasses, 22 x 22 mm</td>
<td>1000 pcs/box</td>
<td>5</td>
</tr>
<tr>
<td>Storing boxes 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>
<td>5</td>
</tr>
<tr>
<td>Monovettes® (orange cap, 10 ml)</td>
<td>pack of 100</td>
<td>1</td>
</tr>
<tr>
<td>Monovettes® (red cap, EDTA, 3 ml)</td>
<td>pack of 100</td>
<td>1</td>
</tr>
<tr>
<td>Monovettes® for needles 21G</td>
<td>pack of 100</td>
<td>1</td>
</tr>
<tr>
<td>Monovettes® for needles 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>
</tr>
<tr>
<td>Racks for blood tubes</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Adhesive tape (small)</td>
<td>pack</td>
<td>5</td>
</tr>
<tr>
<td>Blood culture bottles (Hemoline® performance DUO, children)</td>
<td>12 vials/pack</td>
<td>5</td>
</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>
## Communicable disease toolkit for NIGER: Outbreak investigation kit

### Item Unit Quantity/kit

#### 4. Respiratory module
- **Tongue depressor** pack of 100 5
- **Flexible wire calcium alginate-tipped swab (for pertussis)** pack of 100 1
- **Syringe for suction, 50–60-ml with catheter tip** pack of 60 2
- **Transport swabs with transport medium (example TransAmies®)** pack of 1000 1
- **Virus transport medium (example: Cellmatics®)** pack of 50 1

#### 5. Urine module
- **Urine container with boric acid, with screw cap, 30 ml (sterile)** 400/pack 1

#### 6. Stool module
- **Rectal swabs for adults** 25
- **Rectal swabs for infants** 25
- **Stool collection tubes with spoon** pack of 400 1
- **Tubes with Cary-Blair transport medium** 100

#### 7. CSF module
- **Sterile cotton swab** 100/pack 5
- **Bottle with Trans-Isolate® medium** 100
- **Spinal needle, 25G x 3.5** 25/box 5
- **Spinal needles, 23G x 3.5** 25/box 5
- **Needle for transfer into medium, 21G** 25/box
- **Microtube 2.0 ml, with mouth screw cap and skirted base** 50/bag
- **Local anaesthetics (lidocaine 2% 2 ml), 25G needle, 5-ml syringe** 100

#### 8. Self-protection module
- **Disposable surgical gowns** 10
- **Disposable surgical face masks** 50 pcs/box 5
- **Disposable gloves: sizes S, M, L** 100 pcs/box 5
- **Goggles** 10
- **Face masks** 10
- **Disposable surgical caps, size M** 50 pcs/box 5
- **Rubber surgical boots** Pair, size 42 5
- **Disposable impermeable shoe covers, length 38 cm** 100 pcs/bag 5
- **Impermeable aprons, 90 cm x 112 cm** 5
- **Visors/face-shields** 5

#### 9. Specimen transport module
- **Specimen carrier (cool box)** 5
- **Icepacks** set of 24 5
- **Microcentrifuge tube rack** 5
- **Complete combination packaging for infectious substances, BioPack 2 with 1.5-litre capacity bio jar (example: BioJar®)** 5
- **CL-4 thermal control unit, polystyrene box set in fibreboard case with all labels and instructions** 5